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ORIGINAL EMPIRICAL RESEARCH

Synergistic and cannibalization effects in a partnership loyalty program

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Abstract
The implicit promise of a partnership in a loyalty program (LP) is that the partners will gain new customers and the LP will reinforce the loyalty to focal partners. Although customers may be encouraged to cross-purchase from partners (which may create positive synergies), they can also switch among partners without forfeiting rewards (which may lead to the cannibalization of sales among partners). To explore these cross-partner effects, we analyze the evolution of customer purchases in a partnership LP across 33 partners from 16 industry sectors. We find that cannibalizations arise more frequently than synergies among partners, contributing to a "rich-get-richer" effect for high-penetration partners; e.g., 10% increase in transactions at department stores reduce transactions at apparel partners (by .04% for new transactions and by 1.18% for recurring customers); but in turn, they attract positive synergies from apparel (.11% increase in transactions by new customers and .37% for recurring transactions).

Keywords Loyalty programs · Partnership · Coalition · Cross-buying · Synergy · Cannibalization · Customer purchases · Purchase reinforcement

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Year 2015: "Through [the] Plenti coalition, Rite Aid hopes to reach a significant number of new customers that don't currently shop at Rite Aid. So we think there's a tremendous opportunity for us to drive new customer acquisition.… When we looked at the opportunity to join the coalition, it was important to us to find the way to take advantage of the coalition's benefits while not giving up the equity that we had already built [with our customers]." *Ken Matindale, CEO of Rite Aid, Chain Drug Review*

Year 2018: "Amex ended the Plenti program and all unredeemed Plenti points expired." *American Express.com*

Introduction

Loyalty (reward) programs (LPs) are the most widespread customer relationship management tool employed across industries and markets globally. The global loyalty management market was valued at USD 2617 million in 2018, and it is expected to grow by 23% by 2024 (Orbis Research 2019). The empirical evidence shows that firms that have introduced LPs enjoy overall positive short-term and long-term impacts on sales and gross profitability (Bombaij and Dekimpe 2020; Chaudhuri et al. 2019; Dorotic et al. 2012). However, as the popularity of LPs increases in practice, it becomes more difficult to maintain a competitive advantage and ensure that customers remain active. Only 46% of the enrolled LP memberships in the US were active in 2017, with an expectation of further decline in the future (Colloquy 2017).

To improve the appeal to customers, LPs often add partner firms at which LP members can also collect and/or redeem points. An LP that features multiple partnering firms is generally referred to as a *partnership LP* (Breugelmans et al. 2015).[1] Partnership LPs can range from a few partners to coalitions that include tens or even hundreds of partners (e.g., Airmiles, Payback, Nectar). Typically, the partners are from complementary sectors (e.g., airlines and hotels), although the partnership may also include competitors (e.g., airlines or retailers of the same type). In particular, partnership LPs feature numerous retailers (grocery stores, department stores, drug stores, and various specialized retailers) and service providers (banks, entertainment venues, and telecoms). Partnership LPs appeal to customers because they allow LP members to collect rewards more rapidly and offer wide reward redemption options. Membership in partnership LPs reached 2.07 billion consumers worldwide in 2015, or approximately 28% of the world's population (Finaccord 2015).

As the opening quotes show, firms find partnership LPs attractive because they appeal to a wide customer base and offer operational and cost advantages over establishing and running a sole-proprietary LP (Breugelmans et al. 2015; Dorotic et al. 2012). Additionally, in contrast to the case of sole-proprietary LPs, partners can benefit from the partnership network, particularly if participation in the LP encourages customers to cross-buy from partners within the partnership LP (which typically is the aim of the partnership). Therefore, the positive synergistic effects of partnerships may allow partners to gain new customers or transactions from the common LP base. On the other hand, by encouraging customers to cross-buy and seek variety, partnership LPs (particularly those with numerous partners) may promote switching across partners, deal-seeking behavior and the division of loyalty (Berman 2006; Dowling and Uncles 1997). Hence, partners in a partnership LP may suffer from sales cannibalization by other partners. Despite the substantive research on LP effects in sole-proprietary LPs, little is known about the cross-partner effects in partnership LPs (Breugelmans et al. 2015). The business press is divided in its opinion on the effectiveness of partnership LPs (Capizzi and Ferguson 2005; Shoulberg 2018; Nachis 2018). Some articles highlight examples of successful LP partnerships (e.g., Airmiles, Fuel Rewards and Nectar) as the future of loyalty management, while others emphasize examples of high-profile partners withdrawing from partnerships (e.g., Macy's from Plenti; Debenhams, Amazon and Barclaycard from Nectar; ABN AMRO and Albert Heijn from Air Miles Netherlands) or much-publicized demises (e.g., the Plenti coalition by American Express).

Therefore, the main objectives of this study are to investigate the within-partnership effects in a common type of a partnership LP with numerous partners in which the collection and redemption of points is linked to a bank (credit) card. The studied partnership LP has a structure common to most partnership LPs featuring business-to-consumer retailers and service providers, in which some partners are competitors (e.g., shoe retailers), while others may be seen as complementary or neutral based on their product assortment. To explore the potential *synergistic and cannibalization effects* among partners, we follow the evolution of 13 customer cohorts with, on average, 959 active customers per cohort in a large partnership LP and analyze the extent to which the customers expand their set of patronized partners over time. In other words, we explore how customer cross-buying within the partnership affects partners. We analyze the evolution of purchases across 33 partners by customers who joined a large European partnership LP between January 2000 and December 2012.

We find that following their enrollment in the partnership LP, customers indeed expand their relationships by cross-buying from an increasing number of partners over time. In this way, the partners gain new transactions from the partnership LP's base, but in a "rich-get-richer" way, i.e., popular partners with many transactions are more likely than other partners to attract more new and recurring transactions and experience positive cross-partner effects. The cross-partner effects (i.e., the impacts of other partners' transactions on the transactions of a focal partner) are positive for some partners and negative for others; notably, most partners exert positive synergistic effects on some partners but cannibalize others. A simple count of cross-partner effects shows that cannibalization effects are more prominent than synergistic effects, especially among major partners.

This article contributes to the marketing literature and, specifically, the LP literature by providing a comprehensive analysis of cross-partner effects across different types of partners and by examining the evolution of monthly purchases associated with enrollment in a partnership LP. We document significant differences across partner types in terms of the impact of the partnership LP. We specifically consider whether firms can gain new and recurring transactions from customers through their participation in a partnership LP and whether synergistic or cannibalization effects

[1] "Partnership LP", as a generic term, refers to both proprietary LPs with external partners and multivendor or coalition LPs (Breugelmans et al. 2015; Dorotic et al. 2011).

occur when customers buy from more partners. We present a parsimonious graphical representation of the complex relationships across different types of partners. Hereby, we provide novel managerial insights. Although the insights can be seen as specific to this studied European LP partnership program, this program has a structure and partner types that are commonly found in partnership LPs. Our approach, which shows both positive and negative effects among partners, can help shed light on the debated success and demise of partnership LPs.

In the next section, we present an overview of the literature on LP partnerships, and we theorize about the nature and drivers of cross-partner effects. Afterwards, we present the data and the method used to evaluate the partnership synergies and cannibalizations and outline our empirical results. Finally, we discuss the implications of our findings and the theoretical and managerial insights.

Literature review

Partnership loyalty programs

Despite the richness of prior research on LPs, studies that evaluate partnership LPs are relatively rare. We have compiled an overview of the findings regarding partnership LPs in Table 1.

Prior research indicates that having a (sole-proprietary) LP has overall positive effects on firm sales and profitability (Bombaij and Dekimpe 2020; Chaudhuri et al. 2019; Dorotic et al. 2012). The positive LP effects occur due to the LP's ability to increase customer spending and retention with the firm (Liu 2007; Bolton et al. 2000). Similarly, studies show that participation in a partnership LP enhances customers' spending, retention and attitudinal attachment (Dorotic et al. 2014; Evanschitzky et al. 2012; Lemon and Wangenheim 2009; Wang et al. 2018). However, compared to sole-proprietary LPs, partnership LPs seem equally or less effective in increasing the aggregate sales levels of grocery retailers (Bombaij and Dekimpe 2020; Sharp and Sharp 1997). Nevertheless, any generalization of findings is weakened by the scarcity of studies, differences in LP structures and incomparable methodological approaches.

Customers perceive partnership LPs differently than sole-proprietary LPs, and they differentiate between their relationships with a focal firm in a partnership (company loyalty) and with the partnership LP itself (program loyalty). However, studies indicate a positive connection between loyalty to a partnership program and loyalty to the partner firm itself (Evanschitzky et al. 2012; Schumann et al. 2014). For example, appreciation of the partnership LP's benefits diminishes the negative impact of service failures at a single partner firm (Schumann et al. 2014). However, when customers perceive the partnership predominantly as an LP for the main partner, they tend to show a lack of awareness of the presence of other members of the partnership (Moore and Sekhon 2005).

Very few studies have analyzed potential cross-partner effects within a partnership LP, i.e., the impact of one partner in a partnership LP on another. Existing findings are mixed and laden with a lack of common measures (see the *Cross-partner effects specification* column in Table 1). The studies that analyzed aggregate sales levels by partner found no significant difference between the aggregate purchase patterns for partners and those of firms outside the partnership (Sharp and Sharp 1997) and no significant impact of one partner's sales promotions on another partner's aggregate sales (Dorotic et al. 2011). Since cross-partner effects are related to customer cross-buying behavior and store switching within the LP, the aggregate sales models may not be able to account for customer heterogeneity in purchase behavior (Dorotic et al. 2012). Only Lemon and Wangenheim (2009) analyzed cross-partner effects by examining customers' purchases across partners. They showed that cross-buying from a complementary partner (a car rental) in a frequent flier LP reinforces purchasing at the focal partner (an airline), but cross-buying from the focal partner's cobranded credit card does not (in this context, airlines and credit cards are seen as less complementary partners). However, this study had a limited ability to generalize because it analyzed just three (complementary) partners, and it could not fully capture the evolution of individual purchases across partners (because purchases were aggregated yearly across three data points rather than starting at the time of each customer's enrollment). We next propose our conceptual approach for analyzing cross-partner effects in a partnership LP.

Conceptual approach

Synergistic and cannibalization effects among partners

The main value-enhancing proposition of a partnership LP is that it allows its members to earn LP points and redeem LP rewards across all participating partners (Capizzi and Ferguson 2005; Dorotic et al. 2012). Prior research shows that earning rewards and the gratification gained from it motivate customers to increase their purchasing behavior in sole-proprietary LPs (Kivetz et al. 2006; Drèze and Nunes 2011). Moreover, LP members are likely to consolidate their purchases within the LP by increasing the share-of-wallet dedicated to the LP provider (Leenheer et al. 2007). Accordingly, in partnership LPs, customers can gain progressively larger benefits by adopting multiple partners (Lara and De Madariaga 2007). Moreover, in a partnership LP, the nonmonetary transactional and psychological costs of adopting new stores are likely to decrease due to the convenience of using a single card and a single reward mechanism (Evanschitzky et al. 2012; Schumann et al. 2014). Since members do not lose rewards by switching and adopting new partners, partnership LPs offer an important advantage over sole-

Table 1 Selected literature on the effects of partnership loyalty programs (PLPs)

Reference	Context	Partnership structure	Type of data analyzed	LP effects studied and methods used	Cross-partner effects specified	Most relevant findings
Sharp and Sharp (1997)	Various retailers, Australia	PLP with 3 department stores, 2 fuel retailers, and 2 supermarkets	Aggregated purchases in two 9-week periods	Penetration, purchase frequency, repeat-buying across partners and nonpartners	Duplicate buyers: % of a partner's buyers who also purchase from other partners vs nonpartners.	Some partner brands experience somewhat higher average (re)purchase frequencies than non-LP competitors. No evidence of stronger duplicate buying from PLP brands than from non-LP brands.
Lemon and Wangenheim (2009)	Airline in a PLP, Europe	Airline LP with 3 partners: car rental, hotel, cobranded credit card	Annual purchases across 3 years	Individual purchases from the airline and cross-buying from three partners	Cross-buying: if a customer booked a hotel/car through the airline LP's channel or paid with the cobranded card	Customer purchase and satisfaction with the airline increases cross-buying from partners, which in turn reinforces future airline purchases. Effects were observed only for highly complementary partners (airline- hotel/-rental).
Dorotic et al. (2011)	Various industries, The Netherlands	5 partners: grocery, department store, fuel, DIY, electronics	Weekly issuance of LP points per partner for 141 weeks	Impact of LP promotions (featuring one or multiple partners) on sales of the focal partner	Sales increases due to cross-partner promotions	No significant effects of individual and joint partner promotions on aggregate partner performance (number of points issued).
Evanschitzky et al. (2012)	Various retailers, Europe	One retail chain within the PLP	Survey of customers and aggregated transactions 6 months after the survey	Drivers of loyalty to a company versus loyalty to the PLP	–	The perceived value of the PLP increases future transactions. Partnership loyalty is driven by economic gains. Company loyalty is emotionally driven and drives preferences over competitors, but not behavior.
De Noni et al. (2014)	Various retailers in a city-center PLP, Italy	Up to 78 stores in a town-center's PLP	Annual sales data per store for 3 years; annual number of partners and cardholders in the PLP	Performance in the LP: transaction per cardholder, partner profitability (spending per buyer minus discounts)	Duplicate buyers: number of members who made purchases from two stores in the same year	Number of partners and cardholders and transactions per cardholder and stores increase over time but negative impact the profitability of partners. Profitability differs with the partner's network centrality, discount rate and product complementarity.
Dorotic et al. (2014)	Various industries, The Netherlands	Aggregated across all partners	Weekly purchase frequency and spending of LP members for 184 weeks	Impact of reward redemption on individual purchases	–	Reward redemption increases members' purchase behavior before and after redemption when the member can choose when and how much to redeem.
Schumann et al. (2014)	DIY retailer in a PLP with different categories, Germany	Survey of customer of one partner within a PLP	Survey of customers and purchase behavior 6 months prior to the survey	Perceived loyalty intention towards the partner versus towards the PLP	–	Service failure caused by one partner harms both that partner and loyalty towards the PLP. Valuing the benefits of the PLP diminishes the negative effects of service failures.
Kim et al. (2015)	Air Miles Reward Program, various industries, Canada	PLP (groceries, gas, banking, automobile repairs, and	Monthly points accrual (aggregated across partners) for 12 months	Impact of adopting an LP app that facilitates checking balances and reward items and looking up partners' locations	–	Positive impact of app adoption and continued app use on future spending. When customers stop using the app, their spending decreases.

Table 1 (continued)

Reference	Context	Partnership structure	Type of data analyzed	LP effects studied and methods used	Cross-partner effects specified	Most relevant findings
		other types of stores)				
Villacé-Molinero et al. (2016)	Chain of optical shops in a PLP, Spain	One retail chain within the PLP	Aggregated purchases before/after joining the LP	Aggregated purchase volumes and expenditures at one partner before and after joining the PLP	–	No aggregate-level differences in annual volumes and expenditures before/after LP introduction. Higher volumes, more visits, and lower interpurchase times were observed for multipartner buyers than for buyers who frequent only the focal partner.
Wang et al. (2018)	Various industries in a non-US bilingual country	Partners grouped into two categories: high- vs low--penetration	40 months of customer points accrual, redemptions, and marketing efforts	Impact of mobile app and reward options on points accrual and redemption	–	Adoption of a mobile app and POS discount redemption increases points accrual and redemption. Increase is greater for high-penetration category partners than for low-penetration partners.
Bombaij and Dekimpe (2020)	358 grocery retailers, Europe	Various LP structures, single LP vs PLP	Retailer sales productivity	Impact of LP design and country characteristics (competition) on sales	–	Positive impact of LP on grocers' sales productivity with immediate, direct rewards. Positive effect disappears for PLPs and progressive rewards.
Our study	PLP with numerous partners: adoption of partners within the PLP and its impact on behavior	33 unique partners across 16 categories, monthly purchases over 24 months	Evolution of purchases after enrollment in the PLP across LP partners	Cross-partner effects, impact of transactions with a partner on new customers' transactions and repeat customers' repurchasing behavior at the focal partner	Impact of purchasing from other partners on subsequent (cross-) purchasing from focal partners	PLPs exhibit both synergies and cannibalization of partner purchases among existing and new customer transactions. Major partners experience a "rich-get-richer" effect and more cannibalizations than synergies in cross-partner effects on others. Competing partners of the same type cannibalize one another.

Abbreviations: *PLP* partnership loyalty program (including terms such as coalition LP, multi-vendor LP), *LP* loyalty program, *POS* point-of-sale

Table 2 Benefits and pitfalls of partnership LPs relative to sole-proprietary LPs

	Sole-proprietary LP	Partnership LP
Benefit for customers	Reward benefits and discounts collected from focal firm (Berman 2006)	More reward benefits collected across multiple firms (Lemon and Wangenheim 2009) Adopting new partners, variety seeking and store switching without forfeiting rewards (De Noni et al. 2014)
Cost for customers	Switching barriers, forfeiting rewards when purchasing from another firm (Evanschitzky et al. 2012)	Confusion due to large number of partners; lack of awareness about partners (Moore and Sekhon 2005)
Benefit for firms	LP participation increases customer engagement, retention and value (Bolton et al. 2000) and profitability (Chaudhuri et al. 2019)	Lower operational costs of running the LP Purchase reinforcement, retention and engagement (Wang et al. 2018) Diminished effects of service failure at a single partner due to relationship with the partnership LP (Schumann et al. 2014) Potential cross-buying synergies among partners (Lemon and Wangenheim 2009)
Cost for firms	Cost of running the LP and providing rewards	Division of loyalty between partners and the encouragement of deal-seeking switching (Dowling and Uncles 1997) Potential cannibalization between partners

proprietary LPs: they allow variety-seeking and store-switching behavior without forfeiting rewards. However, these benefits to customers can be a double-edged sword for the partners in a partnership LP, as shown in Table 2. On the one hand, partnerships may promote synergies by encouraging customers to cross-buy from multiple partners in the LP. On the other hand, a partnership LP allows store switching, which may lead to sales cannibalization among partners.

To empirically assess the impact of one partner on another in a partnership LP, we propose tracking the evolution of customer purchases across firms within the partnership from the moment of the customer's enrollment in the partnership LP. Over time, one can observe how customers allocate their purchases across partners and cross-buy from various partners within the LP (following Heilman et al.'s (2000) approach for modeling cross-category effects). In particular, we propose examining two behaviors through which cross-partner effects may occur within a partnership LP:

1. *Gaining new transactions through cross-buying within the partnership LP*: This refers to whether customers, after joining the partnership LP through one partner, start purchasing from other partners within the LP. A partner may gain "new-to-the-partner" customers from the customer base of the partnership LP, which comprises customers who are active at other partners.
2. *Reinforcing transactions of existing customers*: This refers to whether adopting new partners and cross-buying from other partners has an effect on existing customers' purchases from the focal partner. In other words, it considers how the expansion to other partners affects recurring customers' purchases from the focal partner.

Both of these behaviors may lead to cross-partner effects, which can be positive (synergistic), in that purchases from other partners subsequently enhance purchases from the focal partner, or negative (cannibalistic), in that transactions with other partners cannibalize sales from the focal partner.

Gaining new transactions through cross-buying by LP members LP members may have two main reasons for cross-buying from multiple partners and thereby adopting new partners in a partnership LP. First, purchasing from multiple partners allows customers to earn LP points and redeem rewards more quickly, which enhances their purchase behavior (Dorotic et al. 2014; Leenheer et al. 2007; Lara and De Madariaga 2007). Second, the partnership LP may decrease the perceived costs and risks of adopting new partners, as belonging to an established partnership LP acts as a quality signal and enhances the visibility of partners (Evanschitzky et al. 2012).

However, not all partners benefit equally from the partnership. In a partnership LP, customers may be aware of only a few of the most prominent partners and be unaware of other members of the partnership (Moore and Sekhon 2005; De Noni et al. 2014). Furthermore, new partners may be added over the duration of a customer's membership. The relationship lifecycle theory suggests that partners may be more likely to attract new customers in the early stage of their relationship with a partnership LP, while in later stages (maturity) of the relationship, customers may stick to purchasing at a select number of partners and may no longer be willing to cross-buy (Dwyer et al. 1987). This is why we argue that the cross-partner effects must be evaluated using the evolution of purchases starting from the moment of the customer's enrollment.

Purchase reinforcement for recurring transactions Partnership LPs could increase the transactions of recurring customers at the partners that these customers have adopted. However, as partnership LPs may also encourage variety-seeking and the adoption of

other partners, the impact on a focal partner may be twofold. First, cross-buying from other partners may reinforce purchases from the focal partner. However, this effect is found only for highly complementary partners, such as airlines and car rentals (Lemon and Wangenheim 2009) and airlines with complementary routes (Lederman 2008). Second, *cannibalization* effects may occur when purchasing from another partner reduces the purchase behavior at a focal partner. This is especially likely if the newly adopted partner is competing in the same industry (Geyskens et al. 2015) because customers can gain the same rewards by buying the same products from a competitor (Dowling and Uncles 1997; Roehm et al. 2002; Sharp and Sharp 1997). This argument reflects a fear that partners might fund member discounts at another partner, thereby "paying a percentage of members' next purchase somewhere else" (The Loyalty Box 2017).

Data specification

This study analyzes data from a large European partnership LP that participated in the Wharton Customer Analytics Initiative at the University of Pennsylvania. According to the data provider, this partnership LP is one of Europe's oldest and largest LPs. Members can use their LP cards like a cobranded credit card at companies that are partners in the program. Partners range from retailers with wide assortments of goods (department stores) to specialized retailers (e.g., electronics or sporting equipment stores) and diverse service providers (from hotels to car repair services). The partner pays a fee when the LP card is used at the point of sale; this fee is used to finance the rewards for the LP members. There is no fee for joining the partnership LP. Customers can join the partnership through different partners, and their partnership card has the logo of that partner.

We observe the customer transactions of 13 cohorts of customers with, on average, 959 active LP members after their enrollment in the partnership LP. The data contain all the transactions that a customer made with the card within and outside the partnership (at retailers that accept this type of payment card). Since we focus on the cross-partner effects within the partnership, we select purchases within the partnership. The number of cohort/partner/period observations is 8328 per dependent variable. The LP members earn points when they make purchases from partners. Additional promotional points are not included in the transaction amounts. For each 500 points they collect, customers receive a voucher valued at 5 units of the local currency from the LP, which they can redeem at most of the program partners (but not all). The partnership LP did not implement any marketing promotions before or during the observation period that would have encouraged cross-adoption or cross-buying among partners.

Many of the partners have very few observations per individual LP member (many partners were not visited by many of the observed LP members). Therefore, to follow the evolution of purchases across as many partners as possible, we look at the evolution of transactions per cohort of customers who enrolled in the LP. For each calendar year between 2000 and 2012, the data provider constructed a cohort of approximately 1000 randomly sampled customers who enrolled in the partnership LP that year. For example, each customer in Cohort 1 signed up with the partnership LP in 2012, and each customer in Cohort 2 signed up in 2011. Not all customers were active in the observation period, and the average cohort size was 959 active LP members (s.d. 235). Note that the most recent cohort of customers, i.e., those who enrolled in 2012, have only one year of observations until the end of the dataset. For all other cohorts, we use the first 24 months of data. This allows us to focus on the initial point in the relationship when customers are the most likely to adopt partners before they settle into a standard pattern of purchasing or even start abandoning the LP.

The partnership LP advertises that customers can use their card at approximately 370 retail branches. For the purpose of this analysis, we first identify unique partners. We exclude partners whose unique ID could not be determined (e.g., because the data provider aggregated very small partners together). Next, we integrate the different branches of the same partner into one partner ID (e.g., each branch of the main fuel retailer had a different partner ID). This process results in 102 unique partner IDs. Our final selection of partners for inclusion in the analysis requires that the partners have 1) at least one transaction for each customer cohort and 2) at least 10 transactions, on average, in the first 24 months per cohort. Based on the selection criteria above, we retain 33 unique partners, which represent 94.95% of all transactions in this database. The excluded 5% of transactions are spread over a relatively large number of partners. This is illustrated in Fig. 1 by the highly skewed distribution of purchases across partners. From the figure, it is clear that there is a long tail of very small partners (in terms of the number of transactions contributed). The selected partners comprise 16 major partner types or sectors based on their main product assortment characteristics and are grouped by Standard Industrial Classification descriptions. In addition, we have information on other partner-specific characteristics, such as conversion rates from local currency to LP points, redemption policy (whether the partner accepts voucher redemptions), and the date of joining the partnership (for a partner to be selected, we require that each cohort buys at least once from that partner; all but one partner joined before the observation window). The partnership started two years before the data observation window. An overview of the partners is given in Table 3. The descriptive statistics of the model variables are given in Table 4, while the correlation matrix of variables is given in Table 5. The correlation matrix and graphs of average transactions across partners and cohorts are presented in the Web Appendix.

Table 3 Partner types

Partner types	Examples of partners	Number of unique partners in each type	Percentage of transactions within the partnership (%)
Department stores	Department stores	2	39.5
Fuel and car services	Gasoline stations and car services	3	18.3
Shoes	Shoes stores/chains (regular and sports shoes)	3	13.7
Electronics	Consumer electronics retailer	1	8.7
Apparel	Clothing and accessory retailers	9	5.1
Personal services	Beauty salons (hairstyling)	1	1.6
Travel agencies	Travel agencies and tour operators	1	1.5
Drug stores	Drug store and perfumery	1	1.5
Liquor retailers	Wine and spirits retailer	1	1.4
Restaurants	Restaurant chain	1	1
Opticians	Opticians and glasses retailers	3	.9
Convenience stores	Convenience stores	1	.4
Hotels	Hotels	1	.3
Sport and bike equipment	Sports equipment and bike equipment stores	2	.3
Parking and car wash services	Parking and carwash services	2	.2
Jewelry	Jewelry retailer	1	.04

The selected partners presented in the table represent 94.5% of all purchases made within the PLP across 33 partners and 16 types of partners. We analyze the evolution of purchases across these partners

Methodology

Modeling transactions by new and recurring customers

Our conceptualization of cross-partner effects pertains to (1) the likelihood that a focal partner will gain *new transactions* from the partnership LP base and (2) the LP's ability to reinforce the purchases of the *recurring customers* from the focal partner. We follow the evolution of customer transactions across partners in the partnership LP from the moment of the customer's enrollment in the LP. We assume that the "adoption" of a partner in the partnership LP occurs when the customer purchases from that partner for the first time.[2] We investigate the extent to which this adoption, measured by the number of transactions made by "new" customers, depends on purchase behavior at other partners in the partnership LP. In addition, we study how the adoption of and purchases from other partners affect the transactions of the focal partner's recurring customers. We focus on the number of transactions as the main measure because we are primarily interested in the level of activity across partners, for example, how many partners were adopted per month, and because this measure is easily comparable across diverse partners. Figure 2 illustrates our main logic in the modeling approach.

Accordingly, we model the number of transactions at partner p by the two types of customers in cohort c during month t, that is, (1) customers who have not yet made a transaction at this partner (*new* transactions) and (2) returning customers in the cohort who previously made a transaction at partner p (*recurring* transactions). The number of new transactions by cohort c in month t at partner p is denoted by $Y^{new}_{cp,t}$, while the number of recurring transactions is denoted by $Y^{recur}_{cp,t}$. The period t is defined relative to the cohort, starting from the enrollment of the customers in the cohort. Related but separate models are specified for both dependent variables. For the purpose of exposition, we illustrate the main logic of the model in Fig. 2, and we next explain the model used for transactions by new customers in detail. The same modeling approach is used for the transactions of recurring customers.

As few new and returning customers within a cohort make a purchase at a specific partner in a given period, we develop a count model. To account for the relatively large number of observations that equal zero, we apply a zero-inflated Poisson (ZIP) model. This model contains two parts: a logit part to account for excess zeros and a Poisson part that further models the nonzero transaction counts. In the ZIP model, we either obtain a draw from a Poisson distribution or a zero realization. The latter happens with a probability that is given by the logit part of the model. In mathematical terms, we specify the

[2] We only observe transactions in the partnership LP that are linked to the partnership LP card. Customers might have used other types of payments (e.g., cash) that would not be included in this data set. However, since this is in essence a payment card because it is a credit-card-based LP, customers likely use the card regularly as a general means of payment. Moreover, if the same effect occurs repeatedly across each subsequent cohort that joins the LP, we have reason to believe that the effect is not sporadic.

Table 4 Descriptive statistics of variables

Variable	Mean	Median	Skewness	Variance	Min	Max
Number of recuring transactions (Y^{recur})	7.48	0	7.61	696.12	0	555
Number of new transactions (Y^{new})	1.92	1	4.59	13.56	0	67
Founding partner	0.65	1	−0.62	0.23	0	1
Conversion rate	0.71	1	−0.38	0.1	0.2	1
Redemption option	0.64	1	−0.58	0.23	0	1
Hedonic/utilitarian assortment	0.14	0	2.11	0.12	0	1
Ln(1+ lagY)	1.11	0.69	1.18	1.64	0	6.34
Ln(1+ $lagY^{new}$)	0.65	0.69	1.1	0.63	0	4.22
Ln(1+ customer base size)	1.91	1.79	0.41	2.28	0	6.15
Trend*10	9.42	9.17	0.04	33.25	0	19.17
Trend^2	1.22	0.84	0.7	1.3	0	3.67
10*ln(Trend)	6.16	6.51	−0.35	9.96	0	1.7

All statistics are taken across time, cohorts and partners (average cohort size is 959 members, number of cohort/partner/period observations is 8328 per dependent variable (16,656 observations). Y^{recur}: transaction count based on recurring customers; Y^{new}: transaction count based on new transactions by customers who have not previously purchased; Founding partner (1 if the start date is the same as the beginning of the partnership LP; 0 otherwise); Conversion rate of money units to points (1:1; 2:1; 5:1); Redemption (1 if partner accepts points, 0 otherwise); Hedonic/utilitarian (1 for hedonic assortment partners; 0 for utilitarian assortment partners); Ln(1+lagY)- state dependence, total purchases (recurring and new) in previous period; Ln(1+ $lagY^{new}$) – purchases made in the previous period by customers within the LP who purchased from the partner for the first time in that period; trend variables- time trend, evolution over time. For simplicity, we do not report individual cohort descriptors

number of transactions by new customers of partner p as follows:

$$\Pr\left[Y_{cp,t}^{new}=k\right]=\begin{cases}\text{logit}\left(\mu_{cp,t}^{(1)}\right)+\left(1-\text{logit}\left(\mu_{cp,t}^{(1)}\right)\right)\text{Poisson}\left(0|\mu_{cp,t}^{(2)}\right) \text{ if } k=0\\ \left(1-\text{logit}\left(\mu_{cp,t}^{(1)}\right)\right)\text{Poisson}\left(k|\mu_{cp,t}^{(2)}\right) \text{ if } k>0\end{cases}, \tag{1a}$$

where $\text{logit}\left(\mu_{cp,t}^{(1)}\right)=\frac{\exp\left(\mu_{cp,t}^{(1)}\right)}{1+\exp\left(\mu_{cp,t}^{(1)}\right)}$ and $\text{Poisson}\left(k\left|\mu_{cp,t}^{(2)}\right.\right)$ denotes the Poisson probability function with expected value $\exp\left(\mu_{cp,t}^{(2)}\right)$ evaluated at k. Since both model components are similar in terms of the model specification, we use short-hand notation $\mu_{cp,t}^{(l)}$, l=1,2, to refer to them. We further elaborate on the exact specification of the rates $\mu_{cp,t}^{(l)}$ for the explained parts in both model components below.

The expected value of the ZIP model in (1) equals the following:

Table 5 Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Founding partner	1.00	.15	.23	.12	.22	.19	.17	−.01	−.01	−.01	−.03	.18	.21
(2) Conversion rate	.15	1.00	.09	.01	.14	.06	.05	.00	.00	.00	.30	.15	.05
(3) Redemption option	.23	.09	1.00	−.04	.04	.10	.08	.00	.00	.00	.18	.01	.12
(4) Hedonic/utilitarian	.12	.01	−.04	1.00	.14	.07	.07	.00	.00	.00	.26	.23	.07
(5) Ln(1+lag all transactions)	.22	.14	.04	.14	1.00	.86	.84	.28	.23	.30	.01	.64	.64
(6) Ln(1+lag new transactions)	.19	.06	.10	.07	.86	1.00	.75	.15	.08	.18	.01	.43	.70
(7) Ln(1+customer base size)	.17	.05	.08	.07	.84	.75	1.00	.60	.54	.62	.03	.45	.55
(8) Trend*10	−.01	.00	.00	.00	.28	.15	.60	1.00	.97	.99	.00	.14	.03
(9) Trend^2	−.01	.00	.00	.00	.23	.08	.54	.97	1.00	.92	.00	.12	−.02
(10) 10*ln(trend)	−.01	.00	.00	.00	.30	.18	.62	.99	.92	1.00	.00	.14	.06
(11) Indicator no other partner	−.03	.30	.18	.26	.01	.01	.03	.00	.00	.00	1.00	−.10	.02
(12) Recurring transactions (Y^{recur})	.18	.15	.01	.23	.64	.43	.45	.14	.12	.14	−.10	1.00	.44
(13) New transactions (Y^{new})	.21	.05	.12	.07	.64	.70	.55	.03	−.02	.06	.02	.44	1.00

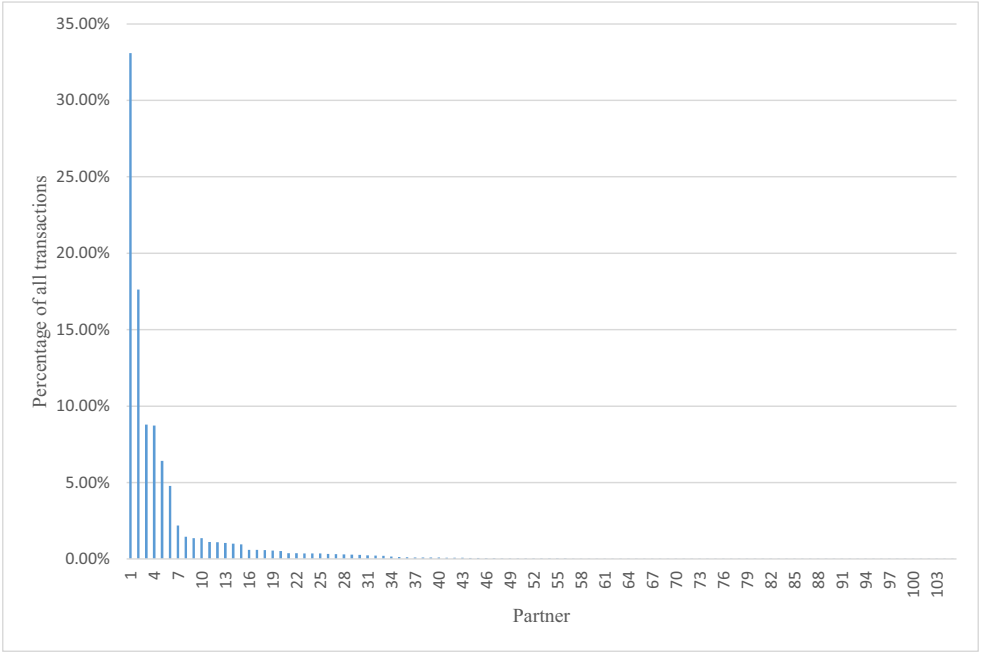

Fig. 1 Distribution of the transactions across partners in the partnership LP

Distribution of transactions across uniquely identifiable partners in the partnership LP. The percentage of transactions on the y-axis represents the percentage of all transactions within the partnership LP that occurred per unique partner on the x-axis (the partner ID is recoded to preserve data anonymity).

$$E\left[Y_{cp,t}^{new}\right] = \Pr[non{-}zero\ outcome]E\left[Y_{cp,t}^{new}|non{-}zero\ outcome\right]$$
$$= \left(1-\frac{exp\left(\mu_{cp,t}^{(1)}\right)}{1+exp\left(\mu_{cp,t}^{(1)}\right)}\right)exp\left(\mu_{cp,t}^{(2)}\right)$$
$$= \frac{exp\left(\mu_{cp,t}^{(2)}\right)}{1+exp\left(\mu_{cp,t}^{(1)}\right)}. \quad (1b)$$

Expression (2) is a combination of the logit probability expression and the expectation from the Poisson model, i.e., the probability of a nonzero outcome multiplied by the expectation count given the nonzero outcome. The rates $\mu_{cp,t}^{(l)}, l = 1, 2$ are functions of the same set of explanatory factors.

To allow for relatively straightforward parameter interpretation, we use semi-elasticities for variables that enter linearly into the rate and normal elasticities for variables that enter through a logarithmic transformation. Semi-elasticity gives the percentage change in the dependent variable due to a unit change in an explanatory factor. Let x denote a focal explanatory variable (e.g., whether the partner allows for point redemption) with parameters $\beta^{(l)}$, $l = 1, 2$. The semi-elasticity[3] of x is as follows:

$$\frac{\partial \mathrm{E}\left[Y_{cp,t}\right]/\partial x_{cp,t,j}}{\mathrm{E}\left[Y_{cp,t}\right]} = \beta_j^{(2)} - \frac{\exp\left(\mu_{cp,t}^{(1)}\right)}{1+\exp\left(\mu_{cp,t}^{(1)}\right)}\beta_j^{(1)}. \quad (1c)$$

In other words, the semi-elasticity of the representative variable x is between $\beta^{(2)}$ and $\beta^{(2)} - \beta^{(1)}$ depending on the excess-zeros probability. This implies that if the sign of $\beta^{(1)}$ is the opposite of the sign of $\beta^{(2)}$, then the sign of the semi-elasticity will be equal to the sign of the coefficient in the Poisson part of the model, that is, $\beta^{(2)}$. The average semi-elasticity can be easily obtained by inserting the average probability of excess zeros. This allows us to calculate the average semi-elasticities for the relevant explanatory components of the model.

Some of the explanatory variables enter through an $ln(1 + x)$ transformation. For such variables, we can show that the elasticity is as follows:

$$\frac{\partial \mathrm{E}\left[Y_{cp,t}\right]}{\partial x_{cp,t,j}}\frac{x_{cp,t,j}}{\mathrm{E}\left[Y_{cp,t}\right]}$$
$$= \frac{\partial \mathrm{E}\left[Y_{cp,t}\right]}{\partial ln\left(1+x_{cp,t,j}\right)}\frac{\partial ln\left(1+x_{cp,t,j}\right)}{\partial x_{cp,t,j}}\frac{x_{cp,t,j}}{\mathrm{E}\left[Y_{cp,t}\right]} =$$
$$= \left[\beta_j^{(2)} - \frac{\exp\left(\mu_{cp,t}^{(1)}\right)}{1+\exp\left(\mu_{cp,t}^{(1)}\right)}\beta_j^{(1)}\right]\frac{x_{cp,t,j}}{1+x_{cp,t,j}}, \quad (1d)$$

[3] Semi-elasticity is preferred over standard elasticity for these variables because, for the ZIP model, it gives a simple expression that is easy to interpret. Semi-elasticity only depends on the parameters and the probability of excess zeros. (Standard) elasticity would also depend on the level of the explanatory variable. A downside of semi-elasticity is that it depends on the scale at which the x-variable is measured.

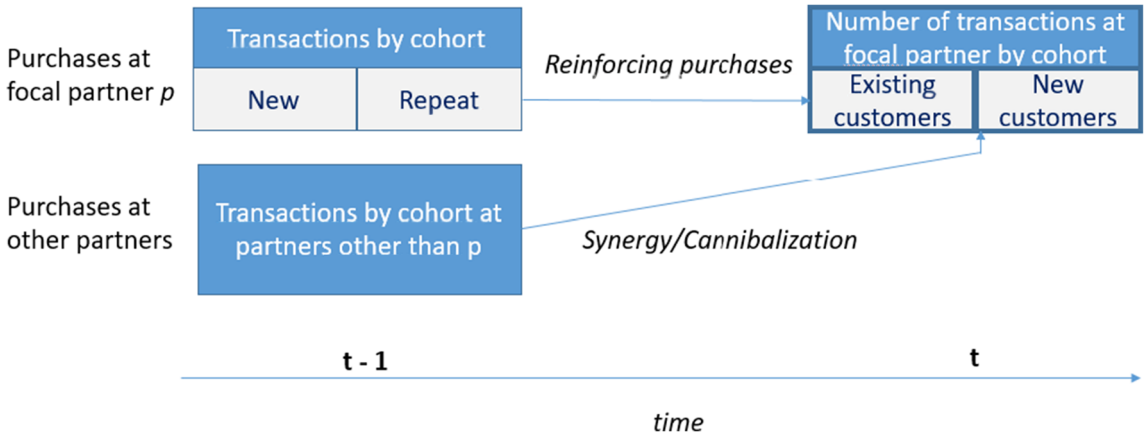

Fig. 2 Graphical representation of the modeling approach

where we again use $\beta^{(l)}$, $l = 1, 2$ to denote the coefficients of the variable $\ln(1 + x_{cp,\ t,\ j})$. This implies that when $x_{cp,\ t,\ j}$ is large enough, we can approximate the *elasticity* of the variable $x_{cp,\ t,\ j}$ by using the following formula:

$$\left[\beta_j^{(2)} - \frac{\exp\left(\mu_{cp,t}^{(1)}\right)}{1 + \exp\left(\mu_{cp,t}^{(1)}\right)}\beta_j^{(1)}\right]. \quad (1e)$$

In sum, when interpreting the parameters of our model, we will use the average semi-elasticity for variables without logarithmic transformation and the (approximate) average elasticities for variables with $\ln(1+x)$ or $\ln(x)$ transformations. For convenience, we will drop the word "approximate" in our tables and discussions.

Defining the cross-partner effect

We next describe how the rates $\mu_{cp,t}^{(1)}$ and $\mu_{cp,t}^{(2)}$ in Eq. (1a) are specified. Both components contain the cross-effects of transactions at other partners and several controls. The controls are related to a flexible time trend, cohort effects and individual partner characteristics.

To model the cross-effects between partners, we consider the $J = 16$ main partner types in the partnership identified in the data section, and we index these types by j. We model the impact of the previous transactions at type j on focal partner p. Of course, if the focal partner is also of type j, the transactions at the focal partner are excluded. We denote by $Y_{cp,j,t}$ the number of transactions at partners of type j (other than the focal partner p) by the customers in cohort c at time t. Using this variable, we specify the rate $\mu_{cp,t}^{(l)}$ as follows:

$$\mu_{cp,t}^{(l)} = \gamma^{(l)} \sum_{j=1}^{J} W_{ji} ln\left(1 + Y_{cp,j,t-1}\right) + z'_{cp,t}\beta^{(l)}, l = 1, 2. \quad (2)$$

The overall magnitude of the cross-effect is captured by $\gamma^{(l)}$, $l = 1, 2$. The importance of partner type j for partner p is determined by the cross-effect weight W_{ji}, where i corresponds to the type of partner p. We elaborate on the exact specification of this cross-effect weight below. The vector $z_{cp,t}$ in Eq. (2) contains cohort-specific fixed effects, a flexible time trend, lagged transactions at partner p, lagged transactions at partner p by new customers, and the lagged size of the customer base at partner p for cohort c. The time trend starts at 0 for the first observation of every cohort. We include linear, quadratic and logarithmic trend components.[4] The lagged transactions and customer base variables are transformed using an $\ln(1+x)$ function, where we define the customer base of partner p at time t as the number of customers within a cohort that have made a transaction at p at least once at or before t.

The sign and the magnitude of the cross-partner effect of a partner of type j on a partner of type i depends on the cross-effect weight W_{ji}. With 16 partner types, there are $16 \times 16 = 256$ weights to specify. Instead of estimating all 256 weights separately, we parameterize the weights using a map in a two-dimensional latent space. This not only reduces the number of parameters but also yields results that can be easily visualized and interpreted in terms of distances.

Each partner type is represented by a point on the two-dimensional map, where we impose a common map for both dependent variables (i.e., transactions by new and recurring customers). The location of partner type i is given by the two-dimensional vector θ_i. The impact weight of partner type j on type i depends on the Euclidian distance between the two types. The impact weight is high for the partner types that are nearby in the latent space but diminishes as the distance increases. Once a critical distance is passed, the impact weight turns negative and starts to increase in magnitude again. The distance between two partners of the same type is 0 by construction, so we treat this combination separately. Mathematically, we specify the impact weights as:

[4] These three variables will be highly correlated, but this is not a problem for the estimation because we are predominantly interested in controlling for any time trend that may be present rather than in accurately attributing the time trend to the linear, quadratic, and log parts.

$$W_{ji} = \begin{cases} \alpha_{1,j} - \|\theta_i - \theta_j\| & \text{if } i \neq j, \\ \alpha_2 \text{ if } i = j. \end{cases} \quad (3)$$

In Eq. (3), $\|\theta_i - \theta_j\|$ is the Euclidian distance between partner types i and j. The maximum weight of partner type j on the other types is given by the *radius* indicated as $\alpha_{1,j}$, which is restricted to be positive and varies across the types. This radius influences the critical distance at which the sign of W_{ji} changes, i.e., the radius of positive weight for partner type j. As $\alpha_{1,j} > 0$, W_{ji} is positive if partner type i is close to type j. W_{ji} is negative if the two partner types are more than $\alpha_{1,j}$ apart. Graphically, W_{ji} is positive for partner types i that are inside a circle with radius $\alpha_{1,j}$ centered at type j (θ_i). The weight is most negative for the most distant types. The radius of a partner type may be very small, and in this case, the impact weight of this partner type on the other types is mostly negative. The impact weight for partners of the same type is specified to equal α_2. The sign of α_2 is not restricted.

To obtain the actual *cross-effects*, the impact weights need to be multiplied with logit or Poisson multipliers $\gamma^{(l)}$; see Eq. (3). Therefore, the ultimate sign of the cross-effect inside and outside the circle depends on the estimates we obtain for $\gamma^{(l)}$. If the logit multipliers are negative ($\gamma^{(1)} < 0$) and the Poisson multipliers are positive ($\gamma^{(2)} > 0$), then nearby partners exert positive cross-effects on each other. We use the result in (4) to obtain the average cross elasticity of transactions at partners of type j on the transactions of a partner of type i. To this end, we fill in $\gamma^{(l)} W_{ji}$ for the generic parameters $\beta^{(l)}$ that appear in the equation. The impact weights W_{ji} are restricted to be the same across the two dependent variables for parsimony and ease of interpretation. The magnitude and sign of the cross-effects may be different across these variables, as the $\gamma^{(l)}$ parameters can be different.

To uniquely identify the map, we place, without loss of generality, one of the partner types at the origin of the map and one other type at another prespecified location; that is, we set $\theta_1 = (0, 0)'$ and $\theta_2 = (1, 0)'$. These identification restrictions are without loss of generality, as rotations and translations of the entire map do not affect the implied W_{ji}. The scale of the map is compensated by the parameters $\gamma^{(l)}$, $l = 1, 2$.

Model estimation

The model parameters can be estimated using the maximum likelihood estimation. As the model for the new transactions and the model for the recurring transactions share a common latent map, the parameters of both need to be estimated simultaneously. The specification of the log likelihood function is straightforward. Numerical maximization of the log-likelihood function, however, is complicated because the model is highly nonlinear in terms of the parameters. To circumvent the local maxima problem, we repeated the maximization using 25 starting values. The reported results are based on the highest likelihood value obtained.

Results

Table 6 provides the full set of parameter estimates for the models for the two dependent variables (transactions of new and recurring customers within the partnership LP). Due to the nonlinear nature of the model, direct interpretation of the individual parameters in Table 6 is not straightforward. In columns six and eleven, we present the average (semi)elasticity for every variable. The exact impact of an explanatory variable depends on which partner is analyzed, in which cohort, and at what time (customer base in the cohort and the estimated nonlinear time trend). Furthermore, some control variables are clearly correlated; for example, the customer base is by construction positively correlated with time. Given that the focus of our analysis is on the cross-partner effects, we treat all the partner characteristics and cohort characteristics primarily as controls for differences across partners, time, and customer characteristics. We will not discuss these in detail.

The "rich-get-richer" effect among partners in the partnership LP

To facilitate the interpretation of the parameter estimates, we focus on the average (semi) elasticity parameters in Table 6, which combine the Poisson and logit estimates. Notably, the customer base has an important positive impact on transactions by both recurring and new customers. A larger customer base (i.e., in which a large number of customers have already adopted the partner) leads to more expected transactions and a lower probability of zero transactions, which ultimately results in an elasticity of .833 for new transactions and 1.005 for recurring customers' transactions. This is evidence of a "rich-get-richer" effect. If a partner is adopted by many customers, the probability of adoption by other customers increases.

Similarly, the transactions show positive state dependence on both new and recurring transactions. In terms of the focal partner gaining new customers/transactions, we find a positive impact of the overall previous transactions at the focal partner on the likelihood of attracting new customers (avg. elasticity .25), as well as a positive impact of new transactions in the previous period on the attraction of other new customers (avg. elasticity .23). Therefore, the "popular" partners that attracted more new customers in the previous period also obtain more new transactions/customers in subsequent periods. This further supports the "rich-get-richer" effect.

For the impact on transactions by recurring customers, we find similar effects. Partners with a high number of transactions in a past period also have more transactions from repeat

Table 6 Parameter estimates for partner- and cohort-specific effects

	New transactions (Y^{new})					Recurring transactions (Y^{recur})				
	Poisso ($\beta^{(2)}$)	stderr	Logit (zero purchase) ($\beta^{(1)}$)	stderr	Avg (semi) elast.	Poisson ($\beta^{(2)}$)	stderr	Logit (zero purchase) ($\beta^{(1)}$)	stderr	Avg (semi) elast.
Constant	**.873**	.088	**1.902**	.400		**1.008**	.086	**2.475**	.318	
Founding partner (longest tenure)	**−.096**	.034	**−.448**	.160	*.054*	**.147**	.055	**−.239**	.120	.242
Conversion rate	**−.253**	.041	**−.677**	.214	*−.027*	**.589**	.051	.323	.189	.460
Redemption option	**.203**	.033	**.495**	.165	*.037*	**−.851**	.038	−.231	.124	−.759
Hedonic/utilitarian assortment	**−.123**	.035	**−1.039**	.335	*.225*	**.792**	.041	−.051	.172	.812
Ln(1+lag transactions)	−.005	.020	**−.757**	.264	*.249*	**.578**	.013	**−1.829**	.175	1.310
Ln(1+lag new transactions)	**.282**	.022	.150	.318	*.232*	**−.108**	.010	**1.467**	.221	−.695
Ln(1+customer base)	**.651**	.022	**−.546**	.135	*.833*	**.612**	.019	**−.983**	.101	1.005
Trend*10	**.314**	.123	**3.058**	.731	*−.710*	**.389**	.079	**1.413**	.528	−.177
Trend^2	**−.804**	.210	**−5.836**	1.459	*1.150*	**−.732**	.124	**−2.213**	.968	.154
10*ln(trend)	**−.523**	.159	**−3.673**	.864	*.706*	**−.544**	.107	**−1.821**	.642	.185
Indicator for no other partner within type	**−.279**	.034	**−.851**	.205	*.006*	**−.389**	.063	**−.752**	.148	*−.088*
Cross effect multipliers ($\gamma^{(l)}$)	**−.024**	.004	**−.062**	.018	*−.004*	**−.069**	.009	.003	.011	*−.070*

Bolded numbers represent significant effects at the 95% confidence level or more. The number of cohort/partner/period observations is 8328 per dependent variable (16,656 observations from a sample of 12,467 customers). $\beta(1)$ relates to the likelihood of observing zero purchases, and $\beta(2)$ relates to the number of transactions if transactions occur. In addition, cohort-specific intercepts are estimated but for succinctness not reported here. The 6th and 11th columns give the average semi-elasticities for variables without log transformation and the (approximate) average elasticities for variables with ln(1+x) or ln(x) transformations (see Eq. 1c and 1d)

Table 7 Cross-partner impact weights for different types of partners (W_{ji})

		Cross-partner impact weight of partner…															
		Travel ag.	Dep stores	Conv stores	Fuel & car	Appar.	Electr.	Rest.	Hotels	Pers. serv.	Park & wash	Shoes	Drug stores	Liquor	Sport	Jewel.	Optic.
... On Partner…	Travel ag.		2.28	−.42	1.94	.43	−.21	−.26	1.36	.04	.02	2.08	−.14	−.12	.15	−.80	.31
	Dep. stores	.81	*1.22*	.26	.98	−.53	.49	.06	1.69	.03	−.45	1.43	.07	.87	−.53	−1.69	1.00
	Conv. stores	−.13	2.02		.25	−1.25	1.69	1.00	.58	.61	−.40	.29	−1.16	.54	−.90	−2.26	1.20
	Fuel & car	1.21	1.71	−.77	*1.22*	1.03	−.58	−.42	.79	.05	.28	1.70	−.67	−.69	.43	−.27	−.10
	Apparel	1.19	1.69	−.78	2.52	*1.22*	−.59	−.42	.77	.06	.29	1.67	−.70	−.71	.45	−.25	−.12
	Electronics	−.14	2.02	1.47	.22	−1.28		.95	.58	.56	−.45	.28	−1.15	.58	−.94	−2.29	1.19
	Restaurants	−.22	1.56	.75	.35	−1.14	.92		.27	1.29	.09	.10	−1.64	−.19	−.65	−2.06	.71
	Hotels	1.15	2.94	.08	1.31	−.20	.30	.01		.10	−.24	1.71	.08	.54	−.26	−1.37	.83
	Pers. serv.	−.06	1.39	.22	.68	−.80	.39	1.15	.21		.65	.21	−1.74	−.60	−.25	−1.67	.39
	Park & wash	.33	1.33	−.39	1.32	−.16	−.21	.36	.29	1.06		.62	−1.57	−.91	.40	−.97	.02
	Shoes	1.27	2.08	−.82	1.61	.10	−.60	−.76	1.11	−.50	−.51	*1.22*	.23	−.22	−.35	−1.19	−.07
	Drug stores	.36	2.03	−.96	.56	−.96	−.72	−1.18	.79	−1.14	−1.39	1.54		.24	−1.29	−2.23	−.24
	Liquor	−.16	2.30	.20	.00	−1.51	.47	−.28	.71	−.54	−1.27	.55	−.30		−1.46	−2.66	.63
	Sports & bike	.92	1.71	−.42	1.94	.46	−.24	.09	.73	.63	.87	1.24	−1.02	−.64	*1.22*	−.39	.15
	Jewelry	1.01	1.59	−.75	2.26	.79	−.56	−.30	.65	.23	.52	1.43	−.92	−.81	.64		−.12
	Opticians	.39	2.54	.98	.70	−.80	1.20	.74	1.12	.57	−.21	.83	−.67	.74	−.55	−1.85	*1.22*

*Coefficients in italics (diagonal entries) are cross-partner effects within the same partner type when more than one partner is of the same type (nonempty cells); see Table 3 for a more extensive description of the partner types. Note that for the interpretation of cross-partner effects, these weights are multiplied by $\gamma^{(1)}$ multipliers in Table 6; therefore, the sign of the cross-partner effect is opposite the sign of the cross-weights in this table. Travel ag= travel agencies and tour operators, Dep. stores= department stores, Conv. Stores= convenience stores; Fuel & Car= gasoline stations and car services; Appar.= apparel (clothing and accessory) stores; Electr. = electronics store; Rest. = restaurant; Pers. Serv.=personal services; Park & wash= parking places and car wash services; Shoes= shoes retailer stores; Sports & bike= sports and bike equipment stores; Liquor= wine and spirits retailer; Jewelry=jewelry retailer; Opticians= opticians and glass retailers

customers in the current period (the elasticity for lagged transactions is 1.31). If a large proportion of the previous transactions come from newly acquired customers, the positive impact is smaller (the elasticity for lagged new transactions is −.69), which reconfirms the importance of building long-term relationships with customers.

Cross-partner effects on new and recurring transactions

Our parametrization of the cross-partner effects explores the asymmetric impact of one type of partner on others (and vice versa) using cross-partner weights W_{ji} and multipliers $\gamma^{(l)}$ for count- and excess-zero rates. We present the cross-partner weights in Table 7; these need to be multiplied with the $\gamma^{(l)}$multipliers in Table 6 to obtain the final cross-partner effects (see Eq. (2)). In our exposition below, we combine both events (gaining new transactions and reinforcing recurring transactions) to elaborate on the total cross-partner effect.

Together, the results show that there are significant cross-partner effects on both aspects of customer behavior, i.e., the attraction of new transactions from the partnership base and from returning customers. For both dependent variables, the $\gamma^{(l)}$multipliers are negative and significant in the Poisson part (−.069 and −.024, respectively). In the logit part, we find a negative parameter for the number of new transactions (−.062) and a nonsignificant effect for the number of recurring transactions. The average elasticity is negative for both dependent variables (−.070 and −.004, respectively). This implies that partners that are close together in the latent map, i.e., those with a positive weight W_{ji}, exert a *negative influence* on each other. To be exact, the mentioned elasticities hold for a pair of partner types with weight equal to 1. For different weights, the elasticities should be scaled accordingly. On average, the cross-partner effects are weaker for new transactions than for recurring transactions, which is reasonable to expect.

It is important to emphasize that given that the multipliers ($\gamma^{(l)}$) are negative, the direction of cross-partner elasticity is *opposite* the sign of the cross-partner weights W_{ji} in Table 7. A large positive weight implies a strong negative cross-effect. In other words, for the positive W_{ji} weights in Table 7, the interpretation is as follows: if the number of transactions increases for partners of type *j* (in the heading of the columns), this will have a negative cross-partner (cannibalization) effect on partners of type *i* (in the rows of Table 7). One of the main insights gained from Table 7 is that within the partnership LP, both *synergies* and *cannibalization*s occur among partners. In fact, when only the number of partner combinations corresponding to positive versus negative cross-partner weights is counted, we find that although many partners show positive cross-effects for both recurring and new transactions (negative W_{ji}), there are even more combinations in which cannibalization effects occur (positive W_{ji}) (383 versus 693, respectively). This occurs due to notable asymmetries in the effects between partners, which we discuss further below. Since for some types, we have more than one partner (e.g., different brands of apparel retailers), we also analyze the cross-partner effects *within* a partner type. Within the partner type, the cross-effect weight is 1.215 (with a standard error of .183). The positive sign of this cross-partner weight, together with negative multipliers, implies a negative (cannibalization) effect between partners of the same type.

Insights into cross-partner effects and asymmetries For the purpose of providing more insightful explanations, we calculate the cross-effect elasticities of the impact of transactions at one partner on others (cf. Eq. (1d)) using six distinct partners. These partners are selected based on conceptual meaningfulness and are typically represented in partnership LPs: department stores (wide assortment, upscale characteristics and a prominent place in the LP), electronics (specialized partners with a narrow assortment and relatively infrequent purchases), drug stores (a somewhat narrower assortment than department stores, high purchase frequency, utilitarian purchases), apparel retailers (clothes and accessories chain, medium purchasing frequency, competing with department stores in apparel assortment) and restaurants (service provider, lower purchasing frequency, hedonic purchases). The cross-partner elasticities of new transactions and recurring transactions among the selected partners are presented in Table 8.

In this partnership LP, the department stores have a prominent place from the start of the partnership and attract more than one-third of all transactions in the partnership LP. Interestingly, Tables 7 and 8 show that purchases at the department stores *incite* negative (cannibalization) effects on both new and recurring transactions at the other selected partners. The cannibalization effects are particularly prominent for recurring transactions at focal partners (cross-elasticities ranging from −.084 to −.141 for returning customers and −.004 to −.038 for new customers). Similar effects are exhibited by the strong fuel and car service partner type. Moreover, department stores *receive* some positive (synergistic) and some negative (cannibalization) effects from other partner types. Even when cannibalization effects occur, they are smaller than those department stores have on other partner types. In particular, some of the most specialized partners that could be seen as offering an assortment similar to that offered by department stores (apparel retailers, sport equipment, jewelers) show synergistic effects on the department stores (cf. Table 7). In Table 8, we focus on the asymmetries between department stores and a large apparel retailer. 1% increase in the transactions at the main department store cannibalizes new transactions from the apparel retailer with a cross-elasticity of .004 and cannibalizes recurring transactions with an elasticity of .118. On the other hand, purchasing at the apparel retailer

Table 8 Cross-partner elasticities and the resulting impact on transactions for selected partners

		Cross-partner elasticities of avg. transactions of partner…					
		Dep store (main)	Electronics	Restaurant	Drug stores	Apparel chain	Department store (second)
on New Transactions of Partner…	Department store (main)		−.010	−.035	−.001	.011	−.025
	Electronics	−.038		−.011	.022	.024	
	Restaurant	−.021	−.013		.022	.016	
	Drug stores	−.017	.006	−.007		.008	
	Apparel chain	−.004	.001	−.002	.002		
	Department store (second)	−.016	−.006	.000	−.001	.007	
... on Recurring Transactions of Partner…	Department store (main)		−.034	−.116	−.005	.037	−.084
	Electronics	−.140		−.040	.079	.088	
	Restaurant	−.109	−.064		.114	.079	
	Drug stores	−.141	.050	−.055		.067	
	Apparel chain	−.118	.041	−.054	.049		
	Department store (second)	−.084	−.034	−.002	−.005	.037	

*New/recurring transactions refer to the number of transactions at the focal partner by customers who had not previously purchased from the partner (new) and by repeat customers who had purchased from the partner in the past, respectively. The elasticities are calculated based on Eq. 1d. They show the percentage increase/decrease in the expected transactions of the focal partner (in the row) based on the 1% increase in the average number of transactions with the partner during the previous period (in the column). Elasticities are calculated as $\beta_2 - \beta_1$*logit_prob, where $\beta_{2=} \gamma^{(Poisson)} W_{ji}$ and $\beta_1 = \gamma^{(logit)} W_{ji}$ from Tables 6 and 7

shows a positive synergistic effect on the next period's purchases at the department store (elasticities increase by .011 for new transactions and .037 for recurring transactions). In fact, the apparel retailer has a positive synergistic effect on other selected partners (Table 8 column 7) and receives more cannibalization than synergy from others (Table 8, "Apparel chain partner" rows).

The specialized retailer in electronics exhibits and receives both synergistic and cannibalization effects vis-à-vis other partners. The electronics retailer negatively affects transactions at department stores (−.01 and −.034, respectively) but experiences even greater cannibalization effects from department stores (−.038 and −.14, respectively). Interestingly, the positive synergistic effects for electronics retailers come from other retailers with specialized (noncompeting) assortments, such as apparel chains (.024 and .088) and drug stores (.022 and .079). In return, the apparel retailer and drug stores also receive positive synergies from the electronics retailer (.001 and .041 and .006 and .050, respectively). Nevertheless, the effect sizes are relatively small.

Hedonic services, such as restaurant partners, also have and receive both synergistic and cannibalization effects. Among the selected partners, restaurants have the strongest cannibalization effects on the main department store's new and recurring transactions (−.01 and −.116, respectively). For restaurants, notable synergies come from more specialized retailers, such as apparel and drug stores (elasticities of .016 and .079 from the apparel retailer and .022 and .114 from the drug stores).

Last, we look at the cross-partner impact within the same partner type, i.e., the impact of one department store on another in the partnership LP. Table 8 shows cannibalizations between the department stores. The cannibalizations are more pronounced for recurring transactions and are approximately the same size. However, for the new transactions, the negative impact of the second department store is stronger than the main department store's cannibalization of the second store (−.025 versus −.016, respectively). Therefore, asymmetric effects also occur among partners of the same type.

Graphical representation of all cross-partner effects To extend this discussion to all combinations of partner types and facilitate readers' interpretation of the cross effects, we graphically present all the cross-partner weights in a map in Fig. 3. To interpret the findings in the map, the reader needs to select a partner type from the map and find the radius for this partner in Table 9 The radius presented for each partner in Table 9 defines the area of positive, neutral and negative cross-partner weights. For partners that are close to one another on the map (i.e., the distance is smaller than the radius for the selected partner), the cross-partner weights W_{ji} are positive, and thus, the cross-effects themselves are negative (when combined

Table 9 Position and radii for partner types on the two-dimensional map

	Position on coordinates		*Radius* ($\alpha_{1,j}$)
	X	Y	
Travel agencies	0	0	1.811
Department stores	1	0	3.277
Convenience stores	1.581	−1.119	1.518
Fuel & car services	−.543	−.256	2.542
Apparel	−.561	−.274	1.053
Electronics	1.623	−1.087	1.742
Restaurants	1.092	−1.710	1.768
Hotel	.665	−.006	2.022
Personal services	.480	−1.810	1.913
Parking & car washes	−.293	−1.453	1.500
Shoes	−.065	.540	2.627
Drug stores	.778	1.226	1.314
Liquor stores	1.970	.140	1.854
Sports/bike equipment	−.336	−.820	1.036
Jewelry	−.607	−.528	.006
Opticians	1.243	−.698	1.735

*Within-partner distance α_2 for partners of the same type equals 1.215 (std.err. .183). The radius α refers to the critical distance of the baseline impact of one partner type on another, as defined in Eq. (3). The coordinates of the first two partner types are fixed for identification

with the negative γ multipliers in Table 6). At precisely the boundary of a circle with a given radius, the cross-partner effects are zero (neutral), and outside the boundary of the circle, the cross-partner effects become positive. The map shows these circles for two partner types (apparel and electronics retailers). The dimensions in the map (axes) do not have a specific interpretation; the map can be rotated without affecting the interpretation of the cross-partner effects.

The department store type represents a category of partners with a large radius (radius=3.28). For this type of partner, all the other partners are within the radius; therefore, as previously discussed, this partner has negative cross-partner effects on the other partners. On the other end of the spectrum are specialized, narrow-assortment partners that are not frequently patronized (such as jewelers, sports and bike equipment retailers, and liquor stores). They have relatively small radii (closer to zero) and have mostly positive cross-partner effects on other partners. The asymmetric cross-partner effects are easy to follow graphically. Consider the two circles in Fig. 3, i.e., for the apparel retailer on the left and the electronics retailer on the right. Apparel retailers have negative cross-partner effects on nearby partners (such as gas stations, jewelry stores, and sports and bike equipment retailers), but they induce synergies by increasing transactions at other partners (such as drug stores, department stores, opticians, restaurants and personal services). Interestingly, while the department stores have cannibalization effects on apparel, purchasing in the previous week at the apparel partners positively increases the expectation of purchasing at the department stores in the partnership.

On the other hand, the electronics retailer has negative cross-partner effects, cannibalizing transactions from partners such as department stores, convenience stores, opticians, and restaurants, but it shows positive synergies with partners such as drug stores, shoe retailers, fuel stations, apparel stores, and sports equipment retailers.

Robustness check of cross-partner weight specifications The specification of the cross-partner weights allows the sign of the weight to depend on the relative positioning of two partners in the latent space. The sign of the cross-effect therefore also depends on the positioning. To check whether a mix of positive and negative effects indeed exists, we consider an alternative model in which the sign of the cross-effect is fixed. To this end, we change the specification of W_{ji} and define the following:

$$W_{ji} = \begin{cases} \exp\left(\alpha_{1,j} - \left\|\theta_i - \theta_j\right\|\right) & \text{if} \quad i \neq j, \\ \alpha_2 \text{ if } i = j, \end{cases} \tag{4}$$

such that W_{ji} is always positive for $i \neq j$.

The results of this alternative specification show that the fit of this model is substantially worse than the specification shown in Eq. (3). The difference in log likelihood values equals 21.78 in favor of the original model when the two models contain the same number of parameters. This clearly indicates that the specification in Eq. (3) is preferrable and that positive *and* negative cross-effects do indeed exist.

Discussion

Partnership LPs represent the fastest-growing form of networking in relationship marketing and can span a wide range of diverse partner types; i.e., they typically include different types of retailers and service providers (Finaccord 2015). An implicit promise of joining a partnership LP for individual firms is the opportunity to benefit from a large base of LP members and cross-partner synergies. However, with examples that differ in practice and scarce and inconsistent findings in the literature, it is difficult to obtain a good understanding of the possible cross-partner effects. In this study, we aim to contribute to the literature by analyzing the empirical evidence of cross-partner effects in a large partnership LP. Our study provides systematic evidence of synergy and cannibalization effects and the effectiveness of these programs, outcomes that have been debated in the marketing literature (e.g., Dowling

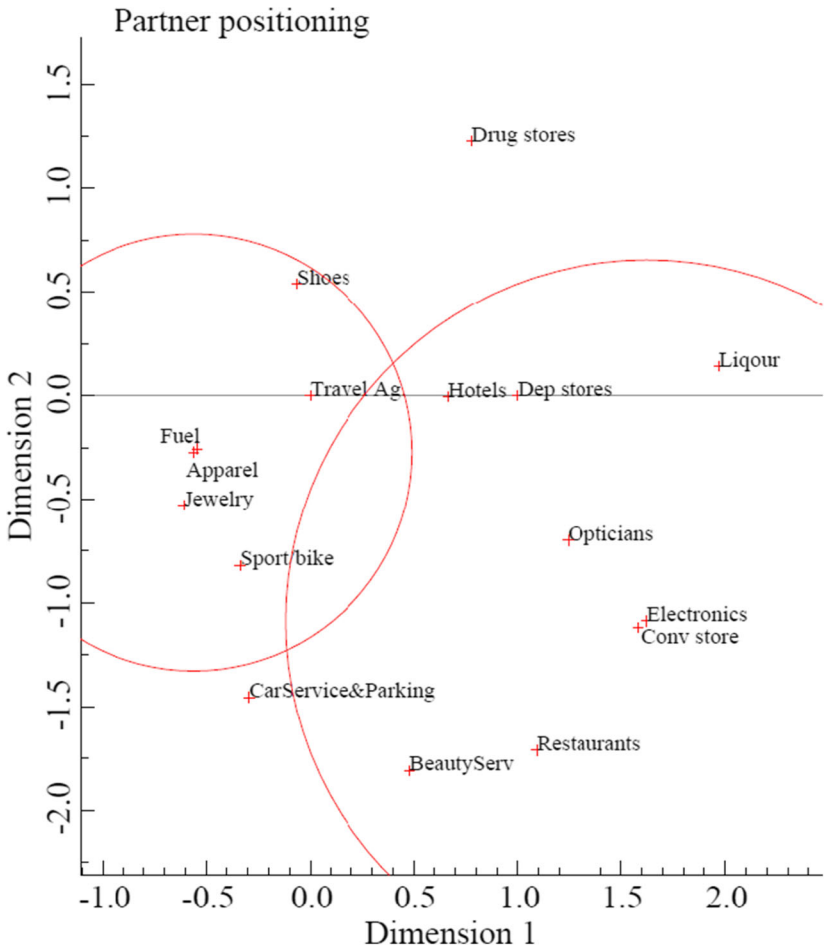

Fig. 3 Graphical representation of cross-partner weights

The map shows cross-partner weights for both new and returning customers' transactions with a partner. The map can be read by considering the distance from a selected partner to another partner. The circles in the map correspond to apparel partners (on the left) and electronics partners (on the right). Given the estimated γ multipliers, the apparel partner type has negative cross-partner effects (cannibalization) on nearby partners within the radius (fuel, jewelry, sports equipment and bicycles and travel agencies), but it shows positive cross-partner synergies with partner types that are farther away on the map (e.g., electronics, convenience stores, restaurants and opticians). The electronics retailer exhibits a negative cross-partner effect on nearby partners within the radius on the right (e.g., convenience stores) and synergies with the partners outside that radius (e.g., shoes or apparel). Abbreviations: *Travel Ag= travel agencies and tour operators, Dep. stores= department stores, Conv. store= convenience stores; Fuel = gasoline stations and car services; Apparel.= clothing and accessory stores; Electronics = electronics store; Rest. = restaurant; Pers. Serv.=personal services; CarService&Parking= parking places and car wash services; Shoes= shoes retailer stores; Sports bike= sports and bike equipment stores; Liquor= wine and spirits retailer; Jewelry=jewelry retailer; Opticians= opticians and glasses retailers.*

and Uncles 1997; Sharp and Sharp 1997) and in practice (e.g., Shoulberg 2018).

First, with our synthesis of prior studies and our analysis, we reconcile diverse findings in the literature. The few studies that have specifically analyzed the impact of one partner on another employed diverse measures and methodologies and found that the effects differ, ranging from a positive impact to a nonsignificant or negative impact (De Noni et al. 2014; Lemon and Wangenheim 2009; Sharp and Sharp 1997). Often, prior studies used aggregated data across all customers and/or all partners; this prevented them from exploring the evolution of purchases across partners, which is a prerequisite for understanding cross-partner effects. We provide empirical evidence of the disputed cross-partner effects for partners within a partnership LP by employing the following approaches: a) examining cross-buying among partners, b) considering the monthly evolution of customer purchases starting from the moment the customer enrolls in the LP, c) performing an analysis across many diverse partners (33 partners from 16 main types) and d) controlling for idiosyncratic partner characteristics.

Overall, our empirical findings demonstrate that significant cross-partner effects occur in partnership LPs through the impact of the transactions at one partner on other partners. In particular, we find that the partnership LP effects reinforce

recurring transactions more strongly than they bring in new transactions through cross-buying within the LP. The positive reinforcement effect on recurring customers is in line with what should be expected in an LP. We find that, in line with other studies on LPs, the analyzed partnership LP reinforces customer purchases at adopted partners, thereby increasing transactions from recurring customers through positive state dependence (Dorotic et al. 2014; Kim et al. 2015; Wang et al. 2018).

Nevertheless, the majority of the transactions conducted within the partnership LP are with a few main partners. This finding is in line with initial evidence regarding other partnership LPs (De Noni et al. 2014; Moore and Sekhon 2005; Wang et al. 2018). In our sample, as much as 95% of all transactions occur at 33 out of 104 identified unique partners. Therefore, we find a long tail of partners with very low transaction frequencies in the partnership.

Moreover, our results show the "rich-get-richer" effects among partners. The partners who have already attracted a large customer base (e.g., department stores, fuel and car services and shoe retailers, in our context) benefit the most. They benefit from the reinforcement effects on their recurring customers, and these customers are not swayed by cross-buying from other partners. They also attract more new transactions. In addition, they are the partners that have negative cross-partner effects (cannibalization) on other partner types; i.e., purchasing at these partners reduces the expected transactions from returning customers at other (typically smaller or narrow-assortment) partners. This finding is in line with initial evidence of De Noni et al. (2014) showing that all partners may not benefit equally from the partnership. Moreover, Wang et al. (2018) found that among customers in a partnership LP, the greatest increase in purchases occurs for high-penetration categories (however, that study did not examine cross-partner effects but focused on aggregated purchases across partners). Hence, we find that for the partners in this partnership LP (which has a structure typical of this type of partnership), evidence of "rich-get-richer" effects exists.

The differences in the impact of partners on one another are evident in the evaluation of cross-partner effects, although we acknowledge that the sizes of the cross-partner effects are small. We find both significant positive (synergistic) and negative (cannibalization) effects in the partnership LP. Overall, our study suggests that cannibalization effects dominate over synergistic effects. This is primarily due to 1) cannibalization within the same partner type and 2) the negative influence of dominant partners on others. Prominent partners (such as department stores and gas and car services) have cannibalization effects on other (typically smaller) partners because purchases from the major partners reduce the expected number of new transactions at the smaller partners in the subsequent period. For example, we find that department stores attract new transactions and reinforce recurring transactions through membership in a partnership LP and, through their wide assortment of offerings, can have cannibalization effects on smaller (specialized assortment) partners, such as apparel retailers and jewelry retailers.

On the other hand, some more specialized stores, such as apparel, electronics, jewelry and sports and bike equipment stores, have positive synergistic effects on many other partners, including specialized partners, such as electronics stores, and large-assortment partners (such as department stores). Purchases from these specialized partners reinforce the expected number of transactions at other partners in the subsequent period.

In conclusion, it is worth noting the asymmetric effects of dominant partners on others, such that department stores have cannibalization effects on other partners but experience both synergistic and cannibalization effects from other partner types. For example, we find asymmetric effects of department stores on apparel stores, in which department stores have cannibalization effects on subsequent purchases at apparel stores. However, purchases at apparel stores show synergistic effects on the attraction of new transactions and the reinforcement of existing customer transactions at department stores.

These intricacies of cross-partner dynamics are minimally explored in the literature, and they can only be analyzed by following the evolution of purchases across partners. Unlike sole-proprietary LPs, partnership LPs encourage cross-buying through variety-seeking and purchasing consolidation within the LP. Since customers gain LP points for purchases across numerous partners, this LP characteristic can lead to both the adoption of new partners within the LP and store switching or cannibalization (particularly among competing partners). Therefore, our finding that both synergy and cannibalization effects occur within the partnership have high face validity.

Our findings strengthen and extend extant insights from the literature. In a survey of UK partnership LP members, Moore and Sekhon (2005) found that LP members perceived the partnership as the LP of a main partner and were largely unaware of the other partners. We find similar evidence here in terms of the transactions, as purchases were grouped across several main partners, and many other partners received very few transactions. Nevertheless, among the 33 partners analyzed, we find that customers adopt multiple partners from within the partnership, so these partners within the LP may gain new transactions from the LP customer base. This finding advances the LP literature by showing that customers do not consider the partnership merely the main partner's LP (as proposed by Moore and Sekhon 2005) but instead perceive it as a network of several partners that allows them to gain rewards (e.g., Dorotic et al. 2012).

In line with the prior arguments in the literature, we provide evidence that cross-partner effects are stronger for nondirectly competing partners and that cannibalization effects occur

more for competing partners (Lemon and Wangenheim 2009; De Noni et al. 2014). We extend the results of Lemon and Wangenheim (2009) by including a larger number of partners with various degrees of complementarity and competition among partner types and showing that both synergies and cannibalization effects occur.

Finally, as noted, our results provide evidence of synergies but also show that cannibalization effects prevail. The prevalence of cannibalization effects over synergies may help explain the recent finding by Bombaij and Dekimpe (2020). Their study found that partnership LPs have lower effectiveness than sole-proprietary LPs and concluded that the positive effects of an LP on sales productivity disappear for partnership LPs.

Managerial implications

Using the insights from this study, we discuss some phenomena observed in practice. Partnership LPs have spurred debate, particularly following the demise of the largest partnership LP in the US, i.e., the Plenti program. Our conceptualization and obtained results suggest that partnership synergies and cannibalizations depend on a partnership LP's ability to encourage cross-buying from partners and relationship building with focal partners. Some sources report that Plenti, in essence, failed to substantively engage customers in a way that allowed the LP mechanisms to reinforce their relationship with the adopted partners (Shoulberg 2018; Nachis 2018). Moreover, customers reported a lack of awareness of the potential synergies among partners by referring to the partnership LP as a "nebulous network of seemingly unrelated partners". In this context, Plenti may have not been able to promote cross-buying to the extent that partners could gain from synergies, particularly if this notion were accompanied by an inability of the LP to reinforce the relationship with focal partners' repeat customers.

Firms need to carefully consider whether they will benefit from a partnership LP by analyzing all potential gains versus costs. There are several caveats that firms must consider when evaluating their position in a partnership LP. First, firms clearly have to consider the costs of joining such programs and make a cost-benefit trade-off. Note that partnership programs are generally less costly than running sole-proprietary LPs, and typically, a specialized LP provider organizes and runs the LP for all partners. From this perspective, to truly evaluate the benefits of being in the LP, a firm must evaluate the cost savings versus potential synergies or cannibalizations on its sales. The second caveat is the marketing promotions and actions that the partnership LP may implement to promote cross-buying effects. Although such actions were not employed by this data provider (to the best of our knowledge), active effort to promote cross-buying between complementary partners can reinforce synergies. However, our findings show that such actions may be a double-edged sword, as they may also promote cannibalizing effects (Dorotic et al. 2011). Third, not all firms benefit alike, and the "rich-get-richer" effect may apply, in which a few of the major partners in the partnership LP (may) benefit the most. Firms should be hesitant to join an LP when there are already competing firms within the LP and when it is unlikely that they will be the major partner. We have noted that many large partnership LPs feature a few dozen to even a few hundred partners. We believe that the distribution of total transactions across all partners in all these partnerships tends to show a "long tail", with a few pronounced partners and numerous other partners in the tail with much fewer transactions.

Research limitations and future research

This study has several limitations. Notably, we study one specific partnership LP in Europe. Our findings are based on this specific case, and although they likely apply to similar partnership LPs, this research stream would benefit from a broader analysis across multiple partnerships. Furthermore, we cannot make causal claims about the impact of joining the partnership relative to not being part of it (i.e., whether firms should join LP partnerships and cease sole proprietary LPs). Although we have a rich data set, we only observe transactions across partners *within* this LP. Our findings suggest that the partnership and individual partners may experience synergy and cannibalization from the transactions at different partners; we cannot claim any insights related to other potential drivers of network synergies.

Although the LP card for this partnership is also a payment card (similar to credit and debit cards) and therefore likely to be used regularly for purchases, our data do not include information about whether customers purchase using different means of payment, such as cash. Furthermore, the partnership we analyze did not use marketing instruments to promote cross-partner adoptions (e.g., offering bonus points for adoptions of program partners). According to the data provider specification, there were no specific promotions of cross-partner adoption. Hence, we could not distinguish between organic, promotion-induced purchases by new adopters and potential cross-partner effects. Therefore, further studies might investigate the size effects of the synergies, based on both the number and amount of transactions, in the presence of explicit marketing actions that promote cross-partner adoption and cross-buying.

Finally, the data did not allow us to study differences among product categories to determine whether differences in mental accounting or some hierarchical form of

decision-making exist across different product categories. Since we are interested in the impact of each partner type on the others, we kept partners of the same type together and analyzed the effects within each type. Future research on cross-partner effects could focus on exploring different groupings of partner types and hierarchies among the product categories. For the operator of the partnership LP, the selection of partners to include in the partnership resembles the choice for creating bundles composed of multiple categories. Therefore, future research may make valuable contributions to investigating the composition of partnerships using general choice models for bundles with multiple product categories (e.g., based on Chung and Rao (2003)). Moreover, customers who are early adopters of a partnership LP may differ from customers who join later; therefore, future research could also look at the differences in cross-effects among early/middle and late cohorts of partnership LP adopters.

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References

Berman, B. (2006). Developing an effective customer loyalty program. *California Management Review, 49*(1), 123–148.

Bolton, R. N., Kannan, P. K., & Bramlett, M. D. (2000). Implications of loyalty program membership and service experiences for customer retention and value. *Journal of the Academy of Marketing Science, 28*(1), 95–108.

Bombaij, N., & Dekimpe, M. (2020). When do loyalty programs work? The moderating role of design, retailer-strategy, and country characteristics. *International Journal of Research in Marketing, 37*(1), 175–195.

Breugelmans, E., Bijmolt, T. H. A., Zhang, J., Basso, L. J., Dorotic, M., Kopalle, P., Minnema, A., Mijnlieff, W. J., & Wünderlich, N. V. (2015). Advancing research on loyalty programs: a future research agenda. *Marketing Letters, 26*, 127–139.

Capizzi, M. T., & Ferguson, R. (2005). Loyalty trends for the twenty-first century. *Journal of Consumer Marketing, 22*(2), 72–80.

Chaudhuri, M., Voorhees, C. M., & Beck, J. M. (2019). The effects of loyalty program introduction and design on short-and long-term sales and gross profits. *Journal of the Academy of Marketing Science, 47*(4), 640–658.

Chung, J., & Rao, V. R. (2003). A general choice model for bundles with multiple-category products: application to market segmentation and optimal pricing for bundles. *Journal of Marketing Research, 40*(2), 115–130.

Colloquy (2017). *2017 Colloquy Loyalty Census, LoyaltyOne*, Retrieved on May 20, 2018 from https://www.colloquy.com/reports/

De Noni, I., Orsi, L., & Zanderighi, L. (2014). Coalition loyalty-programme adoption and urban commercial-network effectiveness evaluation. *International Journal of Retail & Distribution Management, 42*(9), 818–838.

Dorotic, M., Fok, D., Verhoef, P. C., & Bijmolt, T.H.A. (2011). Do vendors benefit from promotions in a multi-vendor loyalty program? *Marketing Letters, 22*(4), 341–356.

Dorotic, M., Bijmolt, T. H. A., & Verhoef, P. C. (2012). Loyalty programmes: cu rrent knowledge and research directions. *International Journal of Management Reviews, 14*(3), 217–237.

Dorotic, M., Verhoef, P. C., Fok, D., & Bijmolt, T. H. A. (2014). Reward redemption effects in a loyalty program when customers choose how much and when to redeem. *International Journal of Research in Marketing, 31*(4), 339–355.

Dowling, G. R., & Uncles, M. (1997). Do customer loyalty programs really work? *Sloan Management Review, 38*(4), 71.

Drèze, X., & Nunes, J. C. (2011). Recurring goals and learning: The impact of successful reward attainment on purchase behavior. *Journal of Marketing Research, 48*(2):268–281.

Dwyer, F. R., Schurr, P. H., & Oh, S. (1987). Developing buyer–seller relationships. *Journal of Marketing, 51*(2), 11–27.

Evanschitzky, H., Ramaseshan, B., Woisetschläger, D. M., Richelsen, V., Blut, M., & Backhaus, C. (2012). Consequences of customer loyalty to the loyalty program and to the company. *Journal of the Academy of Marketing Science, 40*(5), 625–638.

Finaccord (2015). *Global Coalition Loyalty Programs*, Retrieved on September 20, 207 from http://www.finaccord.com/documents/report_prospectus_global_coalition_loyalty_programs.pdf

Geyskens, I., Gielens, K., & Wuyts, S. (2015). United we stand: the impact of buying groups on retailer productivity. *Journal of Marketing, 79*(4), 16–33.

Heilman, C. M., Bowman, D., & Wright, G. P. (2000). The evolution of brand preferences and choice behaviors of consumers new to a market. *Journal of Marketing Research, 37*(2), 139–155.

Kim, S. J., Wang, R. J. H., & Malthouse, E. C. (2015). The effects of adopting and using a brand's mobile application on customers' subsequent purchase behavior. *Journal of Interactive Marketing, 31*, 28–41.

Kivetz, R., Urminsky, O., & Zheng, Y. (2006). The goal-gradient hypothesis resurrected purchase acceleration, illusionary goal progress, and customer retention. *Journal of Marketing Research, 43*, *39–58*.

Lara, P. R., & De Madariaga, J. G. (2007). The importance of rewards in the management of multisponsor loyalty programmes. *Journal of Database Marketing & Customer Strategy Management, 15*(1), 37–48.

Lederman, M. (2008). Are frequent-flyer programs a cause of the "hub premium"? *Journal of Economics & Management Strategy, 17*(1), 35–66.

Leenheer, J., Van Heerde, H. J., Bijmolt, T. H. A., & Smidts, A. (2007). Do loyalty programs really enhance behavioral loyalty? An empirical analysis accounting for self-selecting members. *International Journal of Research in Marketing, 24*(1), 31–47.

Lemon, K. N., & Wangenheim, F. V. (2009). The reinforcing effects of loyalty program partnerships and core service usage: a longitudinal analysis. *Journal of Service Research, 11*(4), 357–370.

Liu, Y. (2007). The long-term impact of loyalty programs on consumer purchase behavior and loyalty. *Journal of Marketing, 71*(4), 19–35.

Moore, G., & Sekhon, H. (2005). Multi-brand loyalty cards: a good idea. *Journal of Marketing Management, 21*((5–6)), 625–640.

Nachis, J. (2018). *Coleman insights: why the Plenti loyalty program failed*. Retrieved January 10, 2020 from https://colemaninsights.com/coleman-insights-blog/why-the-plenti-loyalty-program-failed

Orbis Research (2019). *Loyalty management: Market growth trends and forecasts (*2019-2024*)*. Retrieved on January 27, 2020 from https://www.orbisresearch.com/reports/index/loyalty-management-market-growth-trends-and-forecasts-2019-2024

Roehm, M. L., Pullins, E. B., & Roehm Jr., H. A. (2002). Designing loyalty-building programs for packaged goods brands. *Journal of Marketing Research, 39*, 202–213.

Schumann, J. H., Wünderlich, N. V., & Evanschitzky, H. (2014). Spillover effects of service failures in coalition loyalty programs: the buffering effect of special treatment benefits. *Journal of Retailing, 90*(1), 111–118.

Sharp, B., & Sharp, A. (1997). Loyalty programs and their impact on repeat-purchase loyalty patterns. *International Journal of Research in Marketing, 14*(5), 473–486.

Shoulberg, W. (2018). *Forbes: Plenti customer loyalty program to end in July: What went wrong?*. Retrieved on Feb 15 2020 from https://www.forbes.com/sites/warrenshoulberg/2018/05/01/no-good-and-plenti-as-the-customer-loyalty-program-winds-down/#7047f5eb156d

The Loyalty Box (2017). *Hidden dangers of coalition loyalty programs*. Retrieved February 8, 2017 from http://www.theloyaltybox.com/blog/general-retail/hidden-dangers-coalition-loyalty-programs/

Villacé-Molinero, T., Reinares-Lara, P., & Reinares-Lara, E. (2016). Multi-vendor loyalty programs: influencing customer behavioral loyalty? *Frontiers in Psychology, 7*, 204.

Wang, R. J. H., Krishnamurthi, L., & Malthouse, E. C. (2018). When reward convenience meets a mobile app: Increasing customer participation in a coalition loyalty program. *Journal of the Association for Consumer Research, 3*(3), 314–329.