A multi-tier approach to supply chain collaboration: implications of shopper solutions

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Abstract

Purpose – The authors explored the impact of a popular supply chain collaboration initiative – the shopper solution – on both retailers and manufacturers, as well as on the shopper.

Design/methodology/approach – The authors conducted a quasi-experimental field study, an experimental online study and an experimental behavioral lab study.

Findings – Overall, results revealed that shopper solutions increase the quantity and breadth of displayed products sold, along with sales totals. Shoppers also expressed higher willingness-to-pay (WTP) for products displayed in solutions. Shoppers positively (negatively) attributed the presence (absence) of solutions more strongly to retailers than to manufacturers due to perceived differences in manufacturers' concern for shoppers. Specifically, shoppers expressed higher (lower) word-of-mouth (WOM) and loyalty intentions toward retailers than manufacturers when solutions were (not) provided.

Originality/value – The authors provide a more holistic view of supply chain collaboration by showing how different chain members (retailers vs manufacturers) can experience disparate benefits from collaboration. The authors explain this within the context of shopper solutions by demonstrating that differences in perceived concern for shoppers underlies these effects. Thus, findings suggest that shopper marketing initiatives, such as solutions, are not always "win-win-win" outcomes for retailers, manufacturers and shoppers as intended. Overall, this is the first research to assess the implications of shopper solutions for retailers, manufacturers and shoppers, alike.

Keywords Buyer–supplier relationships, Retail logistics, Supplier management

Paper type Research paper

Introduction

Supply chain collaboration is defined as two or more firms working together to design and implement a joint project for the achievement of mutual benefits (Carvalho *et al.*, 2021; Daugherty, 2011; Ralston *et al.*, 2017; Rejeb *et al.*, 2021). Research suggests that collaboration is the cornerstone of supply chain management (Mentzer *et al.*, 2001) and is associated with a plethora of desirable outcomes (Chen *et al.*, 2017; Li *et al.*, 2015; Liao and Kuo, 2014; Manthou *et al.*, 2004; Ramanathan and Gunasekaran, 2014; Simatupang and Sridharan, 2005). For example, supply chain collaboration can lead to superior supply chain performance (Liao *et al.*, 2017), sustainability performance (Pakdeechoho and Sukhotu, 2018), firm performance (Zhu *et al.*, 2017; Panahifar *et al.*, 2018) and financial performance (Ralston *et al.*, 2017).

Intense competition has led firms to increasingly rely on such inter-firm collaboration to better respond to customers' changing needs (Ekanayake *et al.*, 2017; Gabler *et al.*, 2017; Gligor, 2018; Suzuki and Lu, 2017; Um and Kim, 2019). Researchers have previously noted "in the past decades, there has been a need for firms to look outside their organizations for opportunities to collaborate with partners" (Cao and Zhang, 2011, p. 149), and "today almost

every firm is in the process of applying collaborative activities in their supply chain to make the supply chain more competitive" (Singh *et al.*, 2018, p. 149).

Supply chain collaboration has become particularly important with the increasing popularity of shopper marketing. As we expand upon later, shopper marketing involves joint collaborations between supply chain members that are intended to create "win-win-win" outcomes for manufacturers, retailers and shoppers, alike (Newman *et al.*, 2014; Shankar, 2011, 2014; Stolze *et al.*, 2016). We focus on one in-store shopper marketing initiative, specifically the "shopper solution," that has gained considerable prominence in the marketplace (Grocery Manufacturers Association [GMA], 2011; Food Marketing Institute [FMI], 2006; Shankar, 2014). This approach allows us to explore supply chain collaboration in the context of multi-tier members while additionally accounting for the role of shoppers.

Although supply chain management entails the creation of supply chain surplus and win–win solutions for all members (Chopra and Meindl, 2007; Gligor, 2017; Whipple and Russell, 2007), extant research has largely focused only on its benefits for single members. To illustrate, Panahifar *et al.* (2018) surveyed manufacturing firms to assess whether collaboration impacts these firms' performance, while Pakdeechoho and Sukhotu (2018) surveyed food manufacturing firms to determine whether collaboration impacts their sustainability performance.

Soosay and Hyland (2015, p. 622) relatedly suggest in their comprehensive review of the supply chain collaboration literature that "a more holistic approach to supply collaboration research is warranted, where multi-tier perspectives should be considered simultaneously." Stolze *et al.* (2016, p. 185) echo these sentiments, noting that the supply chain researchers "often ignore the desires and experiences of consumers and rarely acknowledge the shopper", while marketing researchers "pay far less attention to supply chain implementation."

Therefore, we conducted three studies to address these shortcomings. Study 1 was a field study in a real retail store that assessed the impact of this type of supply chain collaboration on the overall supply chain (Study 1). Specifically, we evaluated the impact of shopper solutions on *joint* retailer–manufacturer performance outcomes (i.e. quantity of products sold, sales amount and breadth of products sold) to determine if this type of supply chain collaboration increases supply chain surplus. Next, in Study 2 we conducted an online experiment to investigate the impact of shopper solutions on *retailer-specific* and *manufacturer-specific* performance outcomes (i.e. word-of-mouth (WOM) and loyalty intentions toward retailers and manufacturers) to determine whether different parties in the supply chain benefit differently from this type of supply chain collaboration. Finally, in Study 3 we expanded our investigation to a controlled retail lab environment where participants physically shopped in the presence (or absence) of a shopper solution. There we replicated our Study 2 findings using a different type of solution and assessed its impact on shoppers' product choices and willingness-to-pay (WTP) for items in solutions. Key theoretical and managerial implications findings of these three studies are subsequently discussed.

Theoretical development
Shopper solutions as a form of supply chain collaboration
Extant literature offers various definitions for supply chain collaboration (Zhang and Cao, 2018). For example, Whipple *et al.* (2010, p. 507) refer to it as "relationships where participants generally cooperate, share information, and work together to plan and even modify their business practices to improve joint performance", while Cao and Zhang (2011, p. 166) define it more succinctly as "a business process whereby two or more supply chain partners work together toward common goals." Regardless of the adopted definition, past studies argue that supply chain collaboration yields mutual benefits for the involved parties (Carnovale *et al.*, 2019; Kraft and Raz, 2017; Ralston *et al.*, 2017; Singh *et al.*, 2018).

In this research, the form of supply chain collaboration of interest is shopper marketing, with a specific focus on shopper solutions. Shopper marketing has become an increasingly popular and important practice among major retailers and manufacturers (e.g. Newman *et al.*, 2014; Nikolova *et al.*, 2014). Shankar (2011, p. 217) defined shopper marketing as "the planning and execution of all marketing activities that influence a shopper along, and beyond, the entire path-to-purchase, from the point at which the motivation to shop first emerges through to purchase, consumption, repurchase, and recommendation." As mentioned, shopper marketing initiatives are jointly created and executed by retailers and manufacturers with the premise that they will create "win-win-win" outcomes for shoppers, retailers and manufacturers (Shankar *et al.*, 2011). Since shoppers make up to 76% of their purchase decisions in-store (Liljenwall and Daugherty, 2013), many shopper marketing initiatives are executed in-store and designed to influence consumers while they are in "shopping mode" (GMA, 2011; Hui *et al.*, 2013).

We define shopper solutions here as in-store promotional displays that offers shoppers – in a single convenient location – a defined set of two or more thematically related products designed to satisfy a particular shopper problem or need. Solutions are most often cross-categorical and largely driven by shopper insights (GMA, 2011). The key objectives of shopper solutions are to provide shoppers with incremental value beyond the benefits and features of a single product, while simultaneously streamlining their path-to-purchase (GMA, 2011). For example, a Labor Day-themed solution can offer numerous items from around the store that shoppers often seek to purchase together for their holiday celebration: charcoal, lighter fluid, plates, cups, bug spray, sunscreen and a variety of food and drink items. These complementary items collectively serve as a valuable, convenient "solution" to shoppers' specific need.

Shopper solutions differ in several key ways from more widely studied in-store supply chain collaborations and marketing initiatives (end caps, promotional aisles, islands, demonstrations, window displays, etc.). First, most in-store displays have traditionally featured only a single product (e.g. a certain breakfast cereal), or a variety of *substitute* products from within the *same category* (e.g. many different breakfast cereals) (Huffman and Kahn, 1998; Morales *et al.*, 2005; Nakkas *et al.*, 2020). By contrast, shopper solutions offer an assortment of *complementary* products that are also most often *cross-categorical* in nature (a display of breakfast cereals, pastries, jams fruits, assorted juices, etc. that collectively serve as a "Breakfast" solution). Second, extant research acknowledges that most retail displays have traditionally been used (and thus studied by researchers) in combination with promotional pricing (Cornelius *et al.*, 2010).

Shopper solutions also differ from traditional forms of supply chain collaboration, such as vendor managed inventory (VMI) and efficient consumer response (ECR), in terms of objective and product scope (Frankel *et al.*, 2002; Kaipia *et al.*, 2006; Krichanchai and MacCarthy, 2017; Mejias-Sacaluga and Prado-Prado, 2002; Yang *et al.*, 2005). On the one hand, the objective of VMI and ECR is to ensure product availability on the shelf, with no goal to influence consumers' product choices (Beheshti *et al.*, 2020). On the other hand, the objective of shopper solutions is to influence consumers' product choices and subsequent behavior toward the product (e.g. repurchase and recommendation) (Shankar, 2011). Further, VMI and ECR differ from shopper solutions in terms of product scope. Specifically, VMI and ECR are designed in a way that customers derive value from the individual products included in the VMI and ECR collaboration, while shopper solutions provide shoppers with incremental value beyond the benefits of a single product. Thus, shopper solutions represent a distinct, emerging shift from traditional category management strategies to more innovative solution-driven strategies and "shopper friendly" retail formats (Shankar and Kannan, 2014).

Choice architecture as a framework to predict shopper inferences and behaviors toward shopper solutions
It has been argued that such supply chain collaboration should yield a plethora of benefits, including improved overall performance for involved parties (Li *et al.*, 2017; Soosay and

Hyland, 2015; Singh *et al.*, 2018). The growing "choice architecture" literature provides an appropriate framework to predict such benefits within the context of shopper solutions. Choice architecture is a concept which acknowledges that the precise manner in which options are offered often has a great influence on shoppers' choices (Thaler and Sunstein, 2008). Embedded in this research is the notion that there is no truly neutral way to present options to shoppers. That is, the manner in which a choice is presented will inherently affect shoppers' choices in some way (commonly referred to the "nudge effect") (Johnson *et al.*, 2012; Thaler and Sunstein, 2008). The impact of choice architecture has been observed in a variety of contexts including personal health (Thaler and Sunstein, 2008), finance and investment (Morrin *et al.*, 2012) and food-related decisions (Lamberton and Diehl, 2013).

Existing literature demonstrates that consumers generally hold marketing strategy beliefs that bias their evaluation of marketing stimuli (e.g. shopper solutions). Pertinent to our choice architecture framework, extant work shows that consumers often make inferences about products that retailers strategically choose to display. They tend to rely on retailers to evaluate products on their behalf (Buchanan *et al.*, 1999) and fulfill their needs with the best products possible (Kennedy *et al.*, 2001; Purohit and Srivastava, 2001). Thus, when shoppers evaluate products in a retail display, they often assume that the retailer has chosen to include high quality products in it (Buchanan *et al.*, 1999). They infer that those products will provide them with certain benefits, thereby positively influencing their subsequent product evaluations and purchase decisions (Keh *et al.*, 2021). Displays of complementary products, such as solutions, can further signal to shoppers when, how and where to use the items (Englis and Solomon, 1996; Sun and Gilbert, 2019).

Therefore, we propose that retailers can use solutions as a choice architecture tool to positively affect shoppers' evaluations of displayed complementary products and nudge them toward purchasing the items. That is, shoppers should respond more favorably to products when the retailer chooses to display them together as a solution compared to when the retailer offers them individually in their respective categories around the store. Specifically, we expect the quantity and breadth of products sold to increase when retailers utilize solutions, along with the sales amount. In sum, we expect shopper solutions to have an overall positive impact on the *joint* retailer–manufacturer performance outcomes outlined below. More formally we hypothesize the following, which we test in Study 1:

H1. Compared to a control condition, the presence (absence) of a shopper solution will lead to a higher (lower) (a) quantity of products sold, (b) sales amount and (c) breadth (variety) of products sold.

Choice architecture as a framework to predict shopper inferences and behaviors toward supply chain members

We also examine whether shopper solutions influence consumers' inferences about, and behaviors toward, different supply chain members. Any individual, firm or any other party that organizes, presents or frames choices to shoppers is considered to be a "choice architect." Thus, both retailers and manufacturers act as choice architects when jointly collaborating on shopper solutions. However, there is scant research on the inferences that shoppers may make about choice architects in retail shopping environments. It is further unknown if such inferences differ for retailers as compared to manufacturers.

Prior research demonstrates that consumers often make inferences about retailers based on a number of factors. For example, shoppers make assumptions about retailers based upon the brands they carry (Jacoby and Mazursky, 1984) and the prices they charge (Bodur *et al.*, 2015). Shoppers also make inferences about retailers' motives when they institute price increases (Campbell, 1999) and execute cause-related marketing campaigns (Folse *et al.*, 2010) that subsequently affect their related behaviors.

Building on this, we propose that consumers make inferences about the extent to which a retailer cares about its customers based on whether the retailer voluntarily offers shopper solutions to its or not. In support, prior shopper marketing research demonstrates that retailers who choose to provide extra nutrition information to assist shoppers with their food evaluations and choices are perceived as more concerned about their customers' well-being than retailers who did not offer such information (Newman *et al.*, 2014). Similarly, Cho *et al.* (2018) found that shoppers' perceptions of retailer concern mediated the relationship between the provision of sustainability labeling and their attitudes toward the retailer (see also Cheema and Patrick, 2008; Ellen *et al.*, 2006). We similarly suggest here that shoppers will positively attribute the provision of shopper solutions to retailers; that is, they should infer that a retailer cares a great deal about its customers based on its gesture of offering its shoppers the "best" products for them in convenient solutions. In contrast, prior research on attribution valence in retailing contexts suggests that shoppers may also *negatively* attribute the *absence* of solutions to retailers by inferring that they are *less* concerned about their customers (Puccinelli *et al.*, 2009). We, therefore, formally hypothesize the following, which we test in Studies 2 and 3:

H2. Compared to a control condition, the presence (absence) of a shopper solution will lead to higher (lower) perceptions of (a) retailer concern for shoppers and (b) manufacturer concern for shoppers.

Recall that, in principle, shopper marketing activities should create "win-win-win" outcomes for retailers, manufacturers and shoppers. However, as shown in Figure 1, we propose a novel asymmetry here that shoppers make inferences about retailers as choice architects based on the presence/absence of shopper solutions (regardless of valence), and to a relatively lesser extent, about manufacturers.

In support, prior research shows that shoppers distinguish between the distinct roles that different members of supply chains undertake (e.g. De Jonge *et al.*, 2008; Kennedy *et al.*, 2001; Purohit and Srivastava, 2001). Shoppers expect manufacturers to create high-quality products and expect retailers to serve as intermediaries that match these products with customer needs (Kennedy *et al.*, 2001; Purohit and Srivastava, 2001). Retailers closely interact with customers on a daily basis and are better able to influence shoppers in stores (Shankar, 2014). They typically decide what items to carry and how they are merchandised, thereby maintaining their own unique store images through key decisions about in-store promotions, pricing, service levels and atmospherics (Machleit *et al.*, 2000; Martenson, 2007). In sum, retailers are largely responsible for the wide variety of aspects that affect shoppers' experiences in a typical shopping trip (Puccinelli *et al.*, 2009; Shankar, 2014).
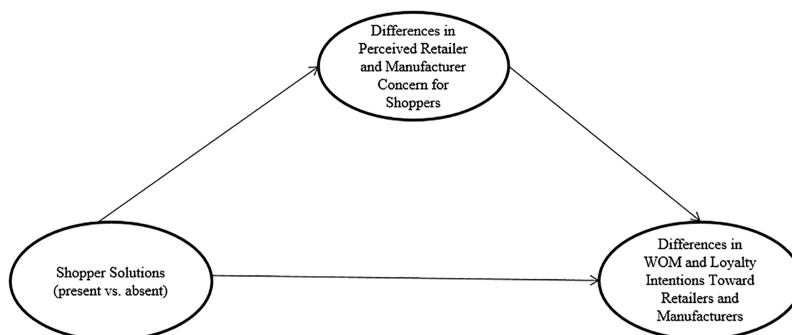
Thus, if shoppers attribute the presence/absence of shopper solutions relatively more strongly to retailers than to manufacturers, the potential benefits/drawbacks of (not) providing solutions should be relatively more pronounced for retailers. We propose that differences in shoppers' perceptions of retailer and manufacturer concern for shoppers will account for differences in their WOM and loyalty intentions toward the two parties. That is, the provision of a shopper solution should increase shoppers' perceptions of retailer concern (relative to manufacturer concern), which should in turn increase WOM and loyalty intentions toward retailers (relative to manufacturers). We conversely expect the *absence* of a solution to have a *negative* indirect effect (IE) on WOM and loyalty intentions toward retailers (as compared to manufacturers). We formally predict the following hypotheses, which we test in Studies 2 and 3.

H3. Perceived retailer concern for shoppers will mediate the effect of the presence/ absence of a shopper solution. Specifically, the presence (absence) of a solution will have a positive (negative) IE on shoppers': (a) WOM intentions and (b) loyalty intentions toward the retailer. Similarly, the presence (absence) of a solution will have a positive (negative) IE on shoppers', (c) WOM intentions and (d) loyalty intentions toward the manufacturer.

H4. Differences in perceived retailer and manufacturer concern for shoppers will mediate the effect of the presence/absence of a shopper solution on: (a) differences in positive WOM intentions expressed toward retailers and manufacturers and (b) differences in loyalty intentions expressed toward retailers and manufacturers [1].

Lastly, we examine the implications of solutions for shoppers as well. As theorized in H1, shoppers are influenced by assortments of complementary items when determining how products should be utilized (Englis and Solomon, 1996). They are more likely to respond in a positive manner when products are presented together as part of a solution. Therefore, it is plausible that shoppers' product choices and WTP for those items should be superior when the products are offered as a solution. We formally hypothesize the following, which we test in a controlled setting in our final study (Study 3).

H5. Compared to a control condition, the presence (absence) of a shopper solution will have a positive (negative) effect on shoppers' (a) choices and (b) WTP.

Study 1
Methods and measures
The purpose of Study 1 was to test H1. Five "outfit solutions," which were displayed on five full-sized mannequins, were implemented in a high-end women's boutique clothing store that sells a variety of clothing, shoes and accessories. For example, a mannequin was dressed in a matching blouse, skirt, shoes and purse to give shoppers a complete outfit solution. The other four mannequins were similarly dressed in complementary items of differing styles and options. In total, there were 21 "items of interest" across all solutions. Since most shopper marketing research has been conducted in a Consumer Packaged Goods (CPG) context, this women's clothing context provides a novel research setting to enhance the generalizability of our findings.

The outfit solutions were present in the store for one week. We recorded how many items of interest were sold during that week (i.e. units sold of each item in the solutions), as well as the total sales (in dollars) of each item of interest during that period. We also recorded this information for the same items of interest during two other time periods: the week immediately before the solutions were introduced and the week immediately after the solutions were removed. All of the items of interest were located in their respective categories around the store during these two time periods when solutions were absent.

Based on the reviewed literature, we expect the total quantity of the items of interest sold – and the associated sales amounts – to be higher during the week when the items are displayed in solutions compared to either week when they are not displayed in solutions (i.e. during the week before the solutions were introduced and during the week after the solutions were removed). We similarly expect the breadth of the items of interest sold to be higher when the solutions are present (i.e. a higher percentage of the 21 items of interest will be sold when they are offered in solutions) [2].

The store did not promote or advertise any products during the study. All prices in the store, including prices of the items of interest, were regular (non-sale) prices and remained constant throughout the entire study regardless of whether an item was in a solution (prices of the items of interest ranged from US$78 to US$575; the average price was US$352.29). The composition of the solutions also remained constant, and all solutions were rotated uniformly around the store to control for any potential positioning confounds (e.g. location prominence).

Results
Overall, the retailer sold a significantly higher overall quantity of the items of interest during the week when the solutions were present ($n = 21$) than during the combined two weeks when the solutions were absent ($n = 9$) ($t = 4.26$, $p < 0.0001$) (see panel A of Figure 2). Specifically, paired sample t-tests revealed that the total quantity of items of interest sold significantly increased from 3 during the week *before* the solutions were introduced to 21 during the week when the solutions were present ($t = 3.70$, $p < 0.01$). The total quantity of items of interest sold then significantly decreased from 21 to 6 during the week *after* the solutions were removed from the store ($t = 3.10$, $p < 0.01$). The total quantity of the items of interest sold did not significantly differ between the two time periods when the solutions were absent ($n_{Before} = 3$ vs $n_{After} = 6$; $p = 0.42$) offering support for H1a.
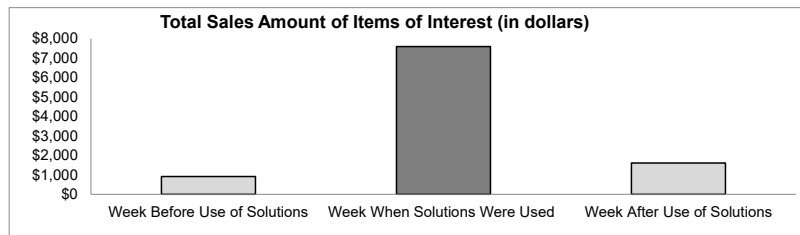
Relatedly, the total sales amount of the items of interest sold was significantly higher during the week when the solutions were present ($n = \$7,587$) compared to the combined two weeks when the solutions were absent ($n = \$2,520$) ($t = 7.51$, $p < 0.0001$) (see panel B of Figure 2). Paired sample t-tests revealed that the total sales amount of the items of interest increased significantly from US$911 during the week *before* the solutions were introduced to US$7,587 during the week when the solutions were present ($t = 6.78$, $p < 0.0001$). The total sales amount of the items of interest then significantly decreased from US$7,587 to US$1,609 during the week *after* the solutions were removed ($t = 5.56$, $p < 0.0001$). The total sales amount of the items of interest did not significantly differ between the two time periods when the solutions were absent ($n_{Before} = \$911$ vs $n_{After} = \$1,609$; $p = 0.47$), offering support for H1b.

Lastly, analyses also revealed a relationship between the breadth of shoppers' purchases (as related to the items of interest) and the presence/absence of solutions (see panel C of Figure 2). Logistic regression results indicate that a wider variety of the 21 items of interest were purchased when the solutions were present ($n = 16$) than when the solutions were absent ($n = 7$) ($b = 2.77$, $p < 0.0001$). More specifically, shoppers purchased only 2 of the 21 items of interest (9.52%) during the week *before* the solutions were introduced, but subsequently purchased 16 of the 21 items (76.19%) during the week when the solutions were present ($b = 3.41$, $p < 0.0001$). The breadth of the items of interest purchased then significantly decreased from 16 to 5 (23.81%) during the week after the solutions were removed ($b = 2.33$, $p < 0.01$). Results from a paired sample t-test indicated that the variety of items of interest purchased did not significantly differ between the two time periods when the solutions were absent ($n_{Before} = 2$ vs $n_{After} = 5$; $p = 0.07$) [3]. Thus, H1c is supported.
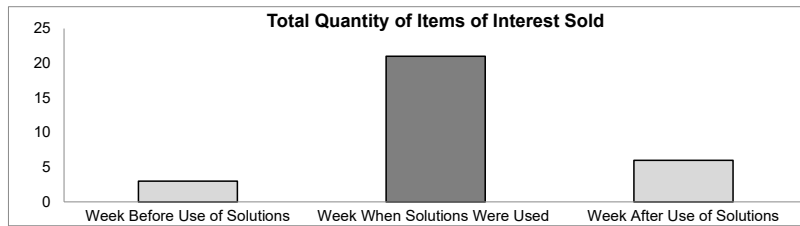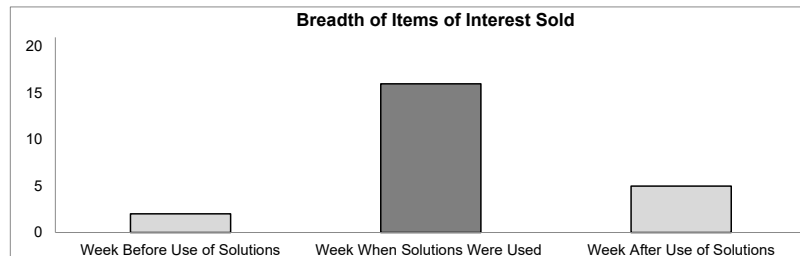
(a)

Note(s): Panel A displays the total quantity of the items of interest sold before, during, and after the use of solutions. Multiple purchases of the same item of interest are included in the totals, where applicable

(b)

(c)

Figure 2.
Study 1 effects of shopper solutions on total number of items of interest sold, total sales amounts of items of interest and breadth of number of items of interest sold

Note(s): The columns in Panel C display the number of unique items that were purchased out of the 21 items of interest before, during, and after the use of solutions. Multiple purchases of the same item of interest are not included in the totals

Study 2

Pretest

The primary purpose of Study 2 was to test H2-H4. We first conducted a pretest of the cold and flu shopper solution utilized in Study 2 to confirm that the proposed products were appropriate for such a solution. We chose to use a cold and flu solution since it is commonly used in retail stores. In total, 30 adult participants were recruited from Amazon Turk (mTurk) to evaluate the assortment of products. We measured the degree of fit for each product in the solution (1 = not a good fit, 7 = good fit), as well as the extent to which the solution was believable (1 = not at all believable, 7 = very believable) and met the cold/flu needs of shoppers in a satisfactory manner (1 = strongly disagree, 7 = strongly agree). Results indicated that all items had a high degree of fit and could be categorized together as a set of

similar cold/flu products (r's ranged from 0.43 to 0.68, all p's < 0.05; M's ranged from 5.27 to 6.67). Results also showed that the assortment was a satisfactory cold/flu solution ($M = 6.10$) and was highly believable ($M = 6.20$). Thus, we used this solution in Study 2.

Methods

Study 2 was an online study that employed a three-between-subjects design (shopper solution provided vs shopper solution not provided vs control) [4]. In total, 224 adult participants recruited from mTurk completed the online study for monetary compensation (62% women; mean age = 32 years, range: 18–61 years). Participants in both the shopper solution present and absent conditions were provided with an example for a Barbecue (BBQ) solution that included charcoal, lighter fluid, matches and tongs. Next, all participants, regardless of condition, imagined that they were shopping for cold and flu products. Their task was to evaluate a variety of cold and flu products, as well as the retailer and manufacturers providing them.

To manipulate the presence/absence of the solution, participants in the solution present condition were told, "The products are offered in one central location." By contrast, participants in the solution absent condition were told, "The products are dispersed around the store in their respective aisles and categories." Shopper solutions were never mentioned at all to participants in the control condition; they were instead told that their responses would be used for marketing research purposes only. This baseline control condition was used to determine whether the provision of a solution merely produces positive effects relative to the solution absent condition, or if the presence of the solution truly has an (absolute) positive impact compared to a baseline control (i.e. when solutions were never mentioned). All participants then answered the dependent measures with the stimuli available at all times.

Measures

Retailer and manufacturer concern for customers were assessed with the items, "This retailer (these manufacturers) cares (care) about its (their) customers" and "This retailer (these manufacturers) is (are) concerned about its (their) customers' welfare" (1 = strongly disagree, 7 = strongly disagree; r's = 0.97 and 0.92, respectively) (Newman *et al.*, 2014). Retailer and manufacturer WOM intentions were assessed with the items: "How likely are you to say positive things about the retailer (these manufacturers) to other people?" and "How likely are you to encourage friends and relatives to do business with this retailer (these manufacturers)?" (1 = not at all likely, 7 = very likely; r's = 0.89 and 0.86, respectively) (adapted from Zeithaml *et al.*, 1996). Retailer and manufacturer loyalty intentions were assessed with the items: "How likely are you to continue to do business with this retailer (these manufacturers) if its (their) prices increase somewhat?" and "How likely are you to pay a higher price at this retailer (for these manufacturers' products) relative to the competition for the same benefit?" (1 = not at all likely, 7 = very likely; r's = 0.58 and 0.66, respectively) (adapted from Srinivasan *et al.*, 2002).

Results

Before testing the mediation outlined in H3 and H4, we conducted a series of repeated-measures ANOVAs to provide initial insight into the Study 2 findings. The solution manipulation served as a between-subjects factor (present vs absent vs control), while the repeated-measure factors consisted of the perceived concern, loyalty intentions and WOM intentions measures for (1) the retailer and (2) the manufacturers.

The repeated-measures analyses revealed significant solution × target (retailer vs manufacturer) interactions for perceived concern for shoppers ($F(2,221) = 17.33$, $p < 0.001$), WOM intentions ($F(2,221) = 26.14$, $p < 0.001$) and loyalty intentions ($F(2,221) = 19.20$, $p < 0.001$) (see Figures 3 and 4). Referring to Figure 3, contrasts revealed that participants in

the solution present condition indicated higher levels of perceived *retailer* concern ($M_{Present}$ = 5.30) than participants in the control condition ($M_{Control}$ = 4.53, p < 0.001) and the solution absent condition (M_{Absent} = 3.89, p < 0.001). Conversely, the absence of the solution decreased perceptions of retailer concern compared to the control (p < 0.001). However, no significant differences emerged for perceived *manufacturer* concern across any of the three conditions (all p's > 0.09). Combined, these effects provide support for H2a, but not for H2b.

As shown in Figure 4, participants in the solution-present condition indicated higher loyalty intentions toward the *retailer* ($M_{Present}$ = 4.03) than participants in the control condition ($M_{Control}$ = 3.32, p < 0.01) and the solution-absent condition (M_{Absent} = 2.87, p < 0.001). Conversely, the absence of the solution decreased retailer loyalty intentions compared to the control (p < 0.05). No significant differences emerged for manufacturer loyalty intentions (all p's > 0.12). Similarly, the provision of the solution led to higher WOM intentions toward the *retailer* ($M_{Present}$ = 5.38) compared to the control condition ($M_{Control}$ = 4.53, p < 0.001) and the solution absent condition (M_{Absent} = 3.86, p < 0.001). The absence of the solution decreased retailer WOM intentions compared to the control (p < 0.01). No significant differences emerged for *manufacturer* WOM intentions (all p's > 0.06).

Mediation
To formally test the IEs proposed in H3 and H4, we used PROCESS.

Model 4 with 5,000 bootstrap samples and 95% bias-corrected confidence intervals (CIs) (Hayes, 2017). Mediation is established when the upper and lower levels of the CI associated with the IE of interest do not contain a value of zero (Hayes, 2017; Hayes and Preacher, 2014). Results for the "solution present → perceived *retailer* concern → retailer WOM intentions" mediational path revealed a significant positive IE of the presence of the solution on participants' expressed WOM intentions toward the retailer (IE = 0.50; CI [0.28, 0.74]). Similarly, there was a significant positive IE of the solution on participants' retailer loyalty intentions through the same mediational path (IE = 0.30; CI [0.16, 0.49]). By contrast, the absence of the solution had a significant negative IE on participants' WOM intentions (IE = −0.37; CI [−0.72, −0.13]) and loyalty intentions (IE = −0.25; CI [−0.47, −0.09]) toward the retailer.
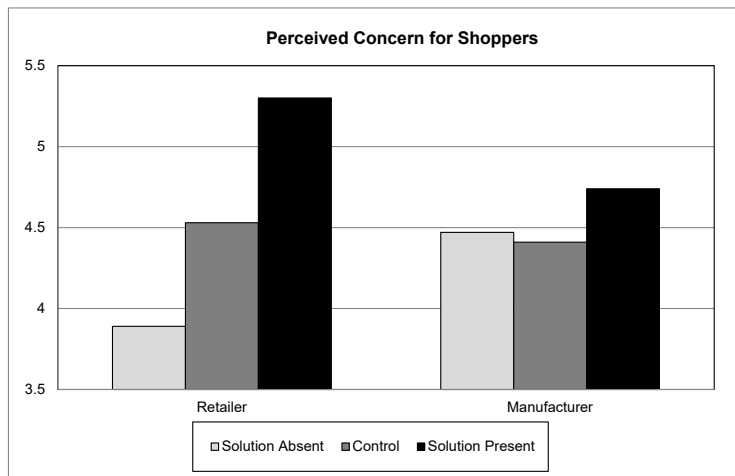

Figure 3.
Study 2 effects of shopper solutions on perceived retailer and manufacturer concern for shoppers
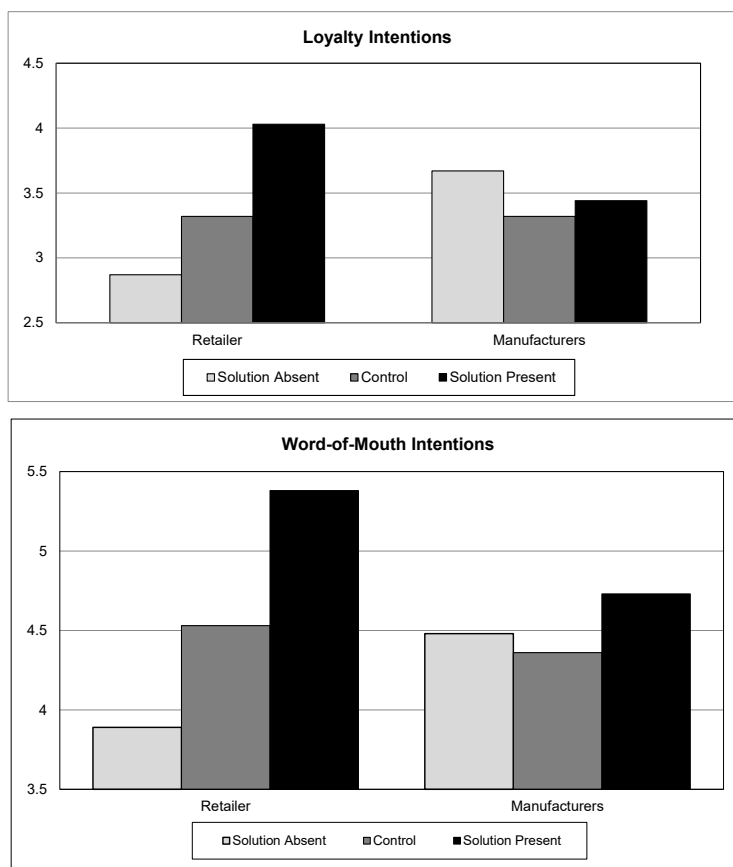
However, analyses of the IE's through perceived *manufacturer* concern indicated that neither the presence nor absence of the solution had a significant IE on participants' manufacturer WOM intentions or loyalty intentions (i.e. all CI's contained zero). Together, these results suggest that perceived concern for shoppers underlie shoppers' WOM and loyalty intentions toward retailers, but not toward manufacturers. Thus, H3a and H3b are supported, while H3c and H3d are not supported.

To expand upon these findings, we subsequently assessed whether participants expressed higher WOM and loyalty intentions toward the retailer than the manufacturers due to differences in perceptions about how concerned each are for their customers (as proposed in H4). In line with prior research, we computed difference scores for each participant for the purpose of conducting the mediation analyses (Patrick and Hagtvedt, 2011; see Tisak and Smith, 1994). A participant's perceived concern difference score was created by subtracting the measure of his/her perception of manufacturer concern from the measure of his/her perception of retailer concern. We used the same approach to create difference scores for the WOM and loyalty intention measures, resulting in a total of three difference score measures for each participant.

To formally test the IEs proposed in H4, we again used PROCESS Model 4 with 5,000 bootstrap samples and 95% bias-corrected CIs (Hayes, 2017). The perceived concern difference score was used as the mediator and the WOM intention and loyalty intention difference scores were each used separately as dependent measures. Results for the "solution present → difference in perceived concern → difference in WOM intentions" mediational path revealed a significant *positive* IE of the *presence* of the solution on differences in WOM intentions expressed toward the retailer and manufacturers (IE = 0.24; CI [0.10, 0.42]). There was similarly a significant *positive* IE of the *presence* of the solution on differences in loyalty intentions through the same mediational path (IE = 0.21; CI [0.08, 0.40]). By contrast, results for the "solution absent → difference in perceived concern → difference in WOM intentions" mediational path revealed a significant *negative* IE of the *absence* of the solution on differences in both participants' WOM intentions (IE = −0.37; CI [−0.72, −0.13]) and loyalty intentions (IE = −0.33; CI [−0.62, −0.12]). Together, these findings confirm that differences in perceived concern mediate the effect of the shopper solution manipulation on differences in participants' WOM and loyalty intentions. Thus, H4a and H4b are fully supported.

Discussion
Study 2 served as a more controlled test of the effects of shopper solutions in a new (online) setting using a new type of solution (cold/flu). We moved beyond Study 1 by examining two new important outcomes for retailers and manufacturers (shoppers' WOM and loyalty intentions; Inman and Nikolova, 2017). We further demonstrated that perceived concern underlies the effects of solutions on these outcomes. The positive IE's associated with the provision of the solution suggest that participants expressed higher WOM and loyalty intentions toward retailers relative to manufacturers because they viewed the retailer as relatively more concerned for shoppers' well-being. Conversely, the negative IE's indicated that participants had *lower* WOM and loyalty intentions toward retailers relative to manufacturers when the solution was *not* offered. Overall, these findings support the notion that shoppers attribute shopper solutions much more strongly to retailers than to manufacturers.

We next seek to replicate these Study 2 findings in a retail lab setting in our final study (Study 3). We then aim to build upon our prior findings by additionally assessing two additional key outcomes for retailers and manufacturers: shoppers' product choices and their WTP for those products in the presence/absence of solutions. The controlled, yet realistic, setting of Study 3 affords us more internal validity than Study 1 while allowing us to also enhance the generalizability of the Study 2 online findings.

Study 3
The objectives of Study 3 were to replicate H2-H4 and to test H5. Study 3 employed a one-factor-between-subjects design (shopper solution provided vs shopper solution not provided). A mixed sample of 122 adults and undergraduate students (55% women; mean age = 22 years, range = 18–50) were recruited from a large public university's subject pool and participated for a chance to win several gift cards. The study was conducted in the university's Shopper Experimental Lab Facility (ShELF), a behavioral research laboratory carefully designed to look like a real retail store. The ShELF offers a wide variety of products (food items, cosmetic products, cleaning supplies, etc.) and it can be arranged to accommodate a number of different store layouts.

Study 3 procedures were consistent with those used in the previous studies. Participants read the same written information about shopper solutions that was offered to participants in the solution present and absent conditions in Study 2. As in prior studies, participants imagined that they were shopping for the focal products (snacks) and that their task was to

evaluate a number of snack products, as well as the retailer and manufacturers providing them. After reading this information, participants were escorted to the retail lab by a lab assistant.

Once inside the store, the strategic placement of the snack items visually suggested the presence or absence of the solution. In the solution present condition, there was a display labeled as "Snack Central," which offered a variety of different snack items that can commonly be found in a typical grocery store (chips, soda, popcorn, etc.). In the solution absent condition, the same snack items were instead placed around the store in their respective categories (e.g. the chips could only be found in the chip section, the soda could only be found in the soft drink section, etc.). We refer to these items collectively as the "focal products" in our subsequent analyses. The presentation of the snack products was counterbalanced in the solution and on the retail shelves in order to control for any potential positioning confounds (e.g. prominence due to eye level). We chose snacks to mirror solutions often used in retail stores.

All participants completed a pencil and paper survey while in the retail store that contained the main dependent measures of interest. In order to facilitate natural shopping behaviors, participants were allowed to move around the store freely and handle the products while taking as much time as needed to complete the survey. Participants were escorted by a lab assistant to a separate computer lab upon completion of the questionnaire to answer manipulation check and demographic questions in a concluding online survey.

Measures
Product choices were measured by asking participants to "Please circle any of the products below that you would consider purchasing." The listed products included the nine products of interest that were available in the solution, along with nine other "dummy" snack products that were not offered in the solution (but were offered elsewhere in the store to all participants). The dummy snacks were included as possible choices to limit forced decision-making and to better reflect a real shopping experience where many options are available (further, participants were not required to choose any products at all). This allowed for a more conservative test of whether shoppers' choices differed based on how the same nine products were offered (i.e. together in single solution vs separately in their respective categories around the store). Participants received one point for each of the nine products of interest that they chose (if any), resulting in a minimum score of 0 and a maximum score of 9. We assessed participants' average WTP for those nine focal products using the same procedures from Study 1 (participants were again not given a frame of reference for prices and were told to indicate a price of US$0 if they were unwilling to pay for a product). Lastly, we used the same measures from Study 2 to assess perceived retailer/manufacturer concern for shoppers, retailer/manufacturer WOM intentions and retailer/manufacturer loyalty intentions (r's ranging from 0.70 to 0.89).

Results
One objective of Study 3 was to replicate the Study 2 findings in a more realistic setting with a different shopper solution. Consistent with Study 2, the provision of the solution increased perceived retailer concern for shoppers ($M_{Present}$ = 4.16 vs M_{Absent} = 3.66; $F(1,119)$ = 4.38, $p < 0.05$) but had no effect on perceived manufacturer concern for shoppers ($p > 0.90$). These findings offer additional support for H2a and further confirm the lack of support for H2b. Also consistent with Study 2, the presence of the solution led to higher *retailer* WOM intentions ($M_{Present}$ = 4.44 vs M_{Absent} = 3.71; $F(1,119)$ = 8.43, $p < 0.01$) and loyalty intentions ($M_{Present}$ = 4.16 vs M_{Absent} = 3.66; $F(1,119)$ = 3.62, $p = 0.03$). However, the solution had no effect on *manufacturer* WOM or loyalty intentions (both p's > 0.35).

Further in line with Study 2, results from PROCESS Model 4 with 5,000 bootstrap samples and 95% CIs indicated that the presence of the solution had a significant *positive* IE through perceived retailer concern on participants' *retailer* WOM intentions (IE = 0.16; CI [0.03, 0.31]) and loyalty intentions (IE = 0.12; CI [0.02, 0.25]). Conversely, there was no IE of the solution through perceived manufacturer concern on WOM or loyalty intentions toward the *manufacturers* (i.e. both CI's contained zero; Hayes, 2017). These findings provide additional support for H3a and H3b and further confirm the lack for support for H3c and H3d.

Lastly, we again created difference scores for the perceived concern, WOM intentions and loyalty intentions measures using the same procedures from Study 2. Findings from PROCESS Model 4 with 5,000 bootstrap samples and 95% CIs revealed a significant positive IE of the solution – through differences in perceived concern – on differences in participants' WOM intentions (IE = 0.13; CI [0.02, 0.27]) and loyalty intentions (IE = 0.10; CI [0.01, 0.27]). These results suggest that differences in perceived concern for shoppers mediate the effects of the solution on the dependent measures, thus providing more support for H4a and H4b (Hayes, 2017).

The other main objective of Study 3 was to assess the impact of shopper solutions on participants' product choices and their WTP for those choices (as outlined in H5). To this end, MANOVA results revealed a positive main effect of the solution on participants' product choices ($F(1,119) = 17.90$, $p < 0.001$) and averaged WTP for the products ($F(1,119) = 2.81$, $p < 0.05$). Participants chose more items of interest when they were displayed in the solution compared to when they were not ($M_{Present} = 4.46$ vs $M_{Absent} = 3.20$). Similarly, participants expressed higher WTP for the items of interest when they were offered in the solution compared to when they were not ($M_{Present} = US\$2.23$ vs $M_{Absent} = US\$2.03$) [5]. Thus, H5a and H5b are fully supported.

Discussion and contributions

The primary purpose of the current research was to investigate supply chain collaboration outcomes in the context of multi-tier supply chain members while also accounting for the role of shoppers. To do so, we conducted three studies that investigated the impact of a specific shopper marketing initiative – the shopper solution – on manufacturers, retailers and shoppers alike. Next, we discuss the implications theoretical and managerial implications derived from our findings.

Theoretical contributions

We augment the literature examining the performance outcomes of collaboration initiatives within supply chains in several ways (Pakdeechoho and Sukhotu, 2018; Panahifar *et al.*, 2018; Ralston *et al.*, 2017, 2020; Vachon and Klassen, 2008). Our findings provide evidence that supply chain collaboration can have a positive impact on performance metrics that are shared among members of the supply chain and thus help increase overall supply chain surplus. Specifically, our Study 1 results revealed that shopper solutions help increase the quantity of products sold, the sales amount and the breadth of products sold; these are *joint* retailer–manufacturer performance outcomes as both parties benefit from these increases. Thus, the current research answers prior calls for more insight on whether complement-based assortments can increase cross-category purchases (Diehl *et al.*, 2015).

Second, we contribute to supply chain collaboration literature by providing empirical evidence that collaboration initiatives provide disparate benefits to different supply chain members. While extant literature has proposed that supply chain collaboration results in win–win solutions for all members (Mentzer *et al.*, 2001), our findings reveal that the distribution of benefits is not always equal. We highlighted a novel asymmetry wherein

shoppers positively (negatively) attribute the presence (absence) of solutions to retailers – but not to manufacturers. We then showed that differences in shoppers' perceptions of retailer/manufacturer concern for shoppers accounted for these disparate outcomes. These findings suggest that both the positive and negative implications of shopper solutions are relatively stronger for retailers than for manufacturers. This is a noteworthy finding indicating that some members of the supply chain benefit more than others from collaboration initiatives due to the incongruent inferences that shoppers make about them.

Third, we respond to the call for a multi-tier perspective on collaborative relationships within supply chain (Soosay and Hyland, 2015) by investigating the impact of solutions on retailers, manufacturers and shoppers. In doing so, we were able to offer a more holistic perspective on how supply chain collaboration can impact different supply chain members. We also addressed Soosay and Hyland's (2015) call for supply chain collaboration research to account for the role of shoppers. In Study 3, we showed that collaboration initiatives can directly impact shoppers' product choices and their WTP for items in solutions.

Fourth, we also contribute to the growing bodies of work on shopper marketing, choice architecture and in-store decision-making in several important ways (Stolze et al., 2016; Newman et al., 2014; Nikolova et al., 2014). To our knowledge, this research is the first to assess the implications of shopper solutions for retailers, manufacturers and shoppers. Using a choice architecture theoretical framework, we provided evidence that shoppers respond positively to the choice architecture (i.e. solutions) created by retailers and manufacturers in the form of more favorable WTP, choices and purchasing behavior. We also showed that shoppers respond to the choice architects, themselves, (i.e. supply chain members) based on the provision of solutions in the form of future WOM and loyalty intentions. From a shopper marketing perspective, these findings collectively demonstrate that solutions can affect shopper behavior at multiple points along the shopping cycle (i.e. both in-store and post-purchase). They also address prior calls for more insight on shoppers' post-choice behaviors (Broniarczyk and Griffin, 2014).

Lastly, our research makes contributions to the category management and retailing literature. Most existing research on retail assortment strategies has focused on substitute products within single product categories (see Lamberton and Diehl, 2013; Diehl et al., 2015). We instead took an inverse approach by examining unique assortments of complementary products from various categories. Another important point of differentiation lies in the fact that we examined assortments organized based on the common solution they provide, rather than on more traditional considerations such as product attributes, brands or size. Thus, this research answers calls for more investigation into the implications of different assortment organizations for retailers and shoppers (Lamberton and Diehl, 2013).

Managerial implications for retailers

Retailers invest considerable amounts of resources into their in-store shopper marketing initiatives and assortment strategies. At the same time, they face enormous pressure to maintain profit margins amidst increasing costs. Prior research demonstrates that retailers can maximize both customer and store profitability when shoppers make cross-categorical purchases (Kumar et al., 2006). Our results similarly indicate that shoppers express higher WTP and increased choices of cross-category products that are offered together in solutions. Thus, managers should know that retailers may be able to increase profitability by offering shopper solutions. Retailers should also consider including high grossing items in solutions to further maximize their profitability.

Importantly, we treated solutions as a non-price promotional tool in this research (i.e. the prices of items in Study 1 were consistent, non-sale prices, and there was no price information given at all in Studies 2 or 3). Our Study 1 results demonstrate that retailers can use solutions

to increase the quantity and variety of items sold without the need for price discounts. In fact, retailers may even be able to use solutions to sell products at a premium as suggested in Study 3 by participants' increased WTP for items offered in solutions. These favorable effects dispel the notion that shoppers might only respond favorably to solutions due to price savings. They also suggest that if retailers were to discount products in solutions that they would be doing so needlessly to the detriment of profitability.

Lastly, loyalty and WOM are two shopper behaviors that are vital to retailers (Inman and Nikolova, 2017). Retailers accordingly invest heavily in customer retention and new customer acquisition (Kumar *et al.*, 2006; Martenson, 2007). However, 61% of retailers believe that keeping loyal customers is an important challenge they face (Retail Systems Research, 2013). For managers, our results indicate that retailers can increase loyalty and positive WOM intentions among their customers by offering customer-friendly solutions. Thus, in sum, our results suggest that retailers may be able to use shopper marketing (and shopper solutions, specifically) to further differentiate themselves from competitors and help build their own brand equity (see Flint *et al.*, 2016).

Managerial implications for retailer–manufacturer relationships and collaborations

Manufacturer investment in shopper marketing activities is growing more than 21% annually – more than any other facet of marketing. As mentioned, these initiatives are created and executed on the premise that they will create "win-win-win" outcomes for shoppers, retailers and manufacturers. However, such outcomes are often difficult to realize due to challenges in aligning retailer–manufacturer strategies (Shankar *et al.*, 2011; Silveira and Marreiros, 2014). Assortment organization, in particular, has been cited as a potential source of conflict between retailers and manufacturers (Lamberton and Diehl, 2013; Silveira and Marreiros, 2014).

The current research provides new insight on the implications of collaborative, cross-category assortments for retailer–manufacturer relationships. Our findings suggest to managers that manufacturers that display products in shopper solutions may be able to realize benefits in the form of increased choices of, and WTP for, their brands and products. Manufacturers may also be able to minimize the long-term loss of profit margins and brand equity often associated with price discounting by using solutions as a non-price shopper marketing tool. Critically, however, manufacturers can only realize these benefits if retailers elect to offer their products and brands in solutions (i.e. retailers may instead choose to place only private labels in solutions or may choose to display a competing manufacturer's brands).

Further, managers should be cautious that the presence of solutions was shown to have no direct effect on shoppers' WOM or loyalty intentions toward the manufacturers whose products were in the display. Shoppers did not perceive manufacturers as more concerned about shoppers when solutions were offered either. So while shoppers may have positive perceptions of retailers that offer solutions and behave positively toward those retailers, they are not likely to also recommend or loyally purchase a particular manufacturer's product or brand that is offered in a solution. Managers should be aware that these differential outcomes can potentially (further) strain relationships between retailers and manufacturers. Disparities may also increase among competing manufacturers (i.e. manufacturer A has its products in a solution but manufacturer B does not).

Limitations and future research

While the three studies we conducted allowed us to gain some unique insights, they are not without limitations. First, the lack of performance measures to assess the actual impact of

shopper marketing initiatives remains a major drawback for both retailers and manufacturers (Shankar *et al.*, 2011; Shankar, 2014; Silveira and Marreiros, 2014). Our field study (Study 1) directly demonstrated how shopper solutions can positively impact actual retail sales. Our Study 2 and 3 findings further reinforced the notion that practitioners can financially benefit from offering solutions (via shoppers' higher WTP, WOM intentions, loyalty intentions, etc.). However, the field study effects were only observed in one store where random assignment was not practically feasible. Future research can build upon this foundation by establishing and testing other key performance metrics in more controlled settings to assess the financial impact of shopper solutions and other in-store shopper marketing activities.

Additional research is also needed to identify conditions in which the (relative) benefits of shopper marketing initiatives for retailers and their suppliers may be enhanced or attenuated. For example, manipulating the type of brands in solutions (e.g. private vs national; Garretson *et al.*, 2002) could be of interest (and might also have important implications for branding decisions in other shopper marketing initiatives). Future research could also observe the potential effects of premium and discounting pricing strategies on the efficacy of shopper solutions. Next, individual consumer characteristics, such as shoppers' product and/or category knowledge, could moderate the documented effects. Similarly, situational characteristics – such as time constraints, the complexity of the problem/solution or perceived scarcity of the items in the solution – could all impact the effects observed here and are worthy of future exploration. Lastly, we examined in-store solutions since retailers tend to focus more on in-store marketing than other areas of the path to purchase (GMA, 2011). Exploring the impact of solutions in other contexts (e.g. online) is highly desirable, however, especially as mobile shopping and usage of retailer apps continue to gain popularity (Newman *et al.*, 2018).

Notes

1. We use difference scores (rather than only individual measures for retailers and manufacturers) to assess if shopper solutions – which are collaborative in nature (GMA, 2011) – are *relatively* more or less advantageous for retailers than for manufacturers. From a practical standpoint, this also allows us to more easily test the proposed mediation.

2. Due to privacy concerns expressed by the store owner and manager, we were not allowed to collect individual-level customer data or to interact with customers in any way (hence the quasi-experimental design). However, we have no reason to believe that the composition or number of the retailer's patrons varied significantly over the course of the study, and we strategically chose the study time frame to avoid any major external events which might have otherwise disproportionately affected sales (e.g. seasonal holidays). Importantly, we also compare observations from the week when solutions were present to observations from both the week before and the week after that period to further mitigate any potential drawbacks (see Nikolova and Inman, 2015).

3. Supplementary analyses show that the total quantity of items of interest sold did not significantly vary across the different solutions (p's ranging from 0.14 to 0.66) nor did the total sales amount of the items of interest (p's ranging from 0.41 to 0.91). These outcomes collectively suggest that no one solution in particular affected shoppers' purchases of the items of interest more than any other solution.

4. We also originally included another between-subjects factor in which only participants in the solution present and absent conditions were told either: (1) the retailer and manufacturers were equally responsible for (not) providing the solution or (2) the retailer was solely responsible. This was done to rule out the alternative explanation that participants attribute more responsibility – rather than concern – to the retailer than the manufacturers (and thus react more positively/negatively toward retailers than manufacturers when a solution is provided/not provided). ANOVA results show no main effect of responsibility on any of the dependent measures, and no solution × responsibility interactive effects. Also responsibility did not moderate any of the Study 2 mediation effects (i.e. there were significant positive IEs through differences in perceived concern that did not vary in strength based on manipulated responsibility). Thus, the responsibility factor was not included in any of the analyses here.

5. We also conducted a separate analysis with log-transformed WTP scores to account for any potential outliers. We observed the same main effect of the solution, such that its provision led to higher WTP ($p < 0.05$).

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