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The impact of a homogenous versus a prototypical Web design on online retail patronage for multichannel providers[☆]

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ABSTRACT

For their online shops, multichannel retailers must decide whether to adopt a prototypical design (with channel-specific attributes) or a homogenous design (with cues corresponding to their physical stores). While most retailers use a prototypical design, we propose that the effectiveness of a Web design depends on customers' cognitive shopping orientations (i.e., specific schemas of store-based or web-based experiences) and their situational processing intensity (i.e., the level of cognitive processing). Three experiments reveal that a homogenous design increases online shop patronage among store-oriented customers if processing intensity is high; a prototypical design does not affect patronage among web-oriented customers. To capitalize on a homogenous design, multichannel retailers should activate customers' cognitive processing, such as with non-competitive pricing or task involvement. If store-based orientation or cognitive processing is low across the customer base, a prototypical design works as well as a homogenous design. Because retailers can induce a store-based orientation through highly visible physical cues in stores, multichannel retailing may evolve to a competition for customers' mindsets.

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1. Introduction

Multichannel retailing has grown increasingly common, and various retailers rely on a range of channels to sell their products. Related literature thus is increasingly devoted to finding ways to coordinate retail mix instruments, such as prices, services, and assortments, across channels (e.g., [Berry et al., 2010](#); [Zhang et al., 2010](#)). In addition, studies investigate the effects of store design (color, shopping paths, product display) on customers' retail experiences in stores (e.g., [Baker, Parasuraman, Grewal, & Voss, 2002](#); [Donovan & Rossiter, 1982](#)), as well as for online retailing and e-commerce, with considerations of usability and aesthetics ([Vrechopoulos, O'Keefe, Doukidis, & Siomkos, 2004](#); [Wang, Minor, & Wei, 2011](#)). These studies show that design strongly enhances customers' perceptions of the online retail

environment and positively influences their patronage intentions. Yet we know of no studies that investigate design coordination across multiple channels – specifically, coordination between offline (physical store) and online channels.

In a multichannel context, the question of whether and to what extent the design of offline and online channels should be coordinated is critical though. Two design strategies are common: (1) distinct designs that ensure a channel-specific format for the online shop and (2) homogenous designs that link the two channels. Most multichannel retailers apply the former, so their online shop reveals a prototypical online design, with standardized, conventional representations of transaction-related information ([Vrechopoulos et al., 2004](#)), including a navigation menu at the top left, a shopping cart symbol at the top right, browsing lists, thumbnails, recommendation displays, search windows, sitemaps, and streamlined transaction procedures. Such standardized web designs offer expected orientation cues for customers who shop online ([Badrinarayanan, Becerra, Kim, & Madhavaram, 2010](#); [Bellman & Rossiter, 2004](#); [Coyle & Gould, 2002](#)). A homogenous design instead emphasizes cues that correspond to the retailer's physical store layout. It might feature corresponding category arrangements, similar sorting within categories, typical markings, and similar campaign presentations. Because a homogenous design may allow customers to switch more seamlessly between store and online channels, customers might experience more multichannel synergy ([Bendoly, Blocher, Bretthauer, Krishnan, & Venkataraman, 2005](#)).

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Some existing conceptual articles discuss whether multichannel retailers should aim for such synergies or capitalize on channel-specific advantages (e.g., Berry et al., 2010; Neslin & Shankar, 2009), but empirical assessments of the impacts of different retail mix instruments are scarce (e.g., Emrich, Paul, & Rudolph, 2015), and no research has scrutinized design. Therefore, we address whether multichannel retailers should use a homogenous or prototypical design online with three experimental studies, in which we investigate the effects of the different designs on customers' patronage intentions and behavior. We also detail the moderating effects of customers' shopping orientation and processing intensity while shopping online. Accordingly, we describe our conceptual framework and main hypothesis in the next section. After we present our three studies, we close with a discussion of the main findings and implications for multichannel management and research.

2. Conceptual development

2.1. Conceptual model

Fig. 1 contains our conceptual model, which we use to compare the impact of homogenous and prototypical designs on customers' patronage intentions and behavior toward a multichannel retailer's online shop. The impact of the web design depends on customers' preconditions when they process design cues. We consider the moderating role of cognitive shopping orientations that arise from customers' previous shopping experiences, because these shopping orientations determine the cues on which a customer focuses when processing the retail environment (Morales, Kahn, McAlister, & Broniarczyk, 2005). We also anticipate that customers' processing intensity moderates the interplay of web design and cognitive shopping orientations. Prior literature shows that processing intensity strongly influences cognition about specific cues in the retail environment and thus their impacts on customer attitudes and behavior (e.g., Wathieu & Bertini, 2007).

Accordingly, we propose that the impact of a homogenous versus a prototypical design is moderated by the fit of the design with customers' cognitive shopping orientations (two-way interaction) and that this moderating effect also depends on customers' processing intensity in the specific situation (three-way interaction).

2.2. Main hypothesis

In line with cognitive schema research (e.g., Fiske & Taylor, 1991), we predict that consumers develop cognitive shopping orientations, which represent simplified categorizations of their environment (Morales et al., 2005). Two shopping orientations are relevant for processing design cues in a multichannel environment: store-based and web-based. A store-based orientation entails cognition about corresponding orientation cues between store environments and online shops, arising after repeated exposure to stores and online channels. In principle, customers with a store-based orientation focus on the cues in a web design that match those in the physical store. In contrast, a web-based orientation implies cognition about online-specific information and search patterns (Bellman & Rossiter, 2004; Häubl & Murray, 2003), which arise from frequent exposure to virtual shopping environments. Customers with a web-based orientation therefore focus on online-specific cues in a web design, which differ from store cues. In summary, fit between the design and a customer's shopping orientation enhances his or her perceptions of the retail environment (Morales et al., 2005).

In this article, we predict that the fit between a web design and shopping orientation increases patronage intentions more substantially if it also activates positive subjective experiences from memory such as knowledge about a retailer's differentiation (Aggarwal & McGill, 2007; Fiske & Taylor, 1991). A homogenous design should activate such positive subjective experiences because physical environments are strongly associated with intensive, sensual stimuli (Berry et al., 2010). Thus, when they see a homogenous design, store-oriented customers may retrieve these positive subjective experiences and their patronage intentions might increase.

This two-way interaction between a homogenous design and a store-based orientation then may be moderated further by the intensity with which the customer processes the design. Processing intensity (i.e., the level of the customer's cognitive activation) is determined intrinsically by high task involvement (Petty & Cacioppo, 1979). High processing intensity strengthens the activation of subjective experiences in memory (Fiske & Taylor, 1991; Tormala, Petty, & Briñol, 2002), so store-oriented customers with high processing intensity may more strongly consider the positive subjective experiences associated with a homogenous design.

Fig. 1. Conceptual model.

Retailers can use extrinsic cues to activate high processing intensity. Wathieu and Bertini (2007) report that moderate overpricing directs more customer attention to attributes that differentiate the retailer from its competition. Therefore, we predict that high processing intensity strengthens the impact of a homogenous design on patronage intentions for store-oriented customers because they more readily recognize the homogenous design cues and access positive subjective experiences.

For a prototypical design, the activation of positive experiences is uncertain, because online environments offer less intensive positive stimuli. These designs tend to be associated with analytical procedures, such as searching through search engines, and rely on attribute-based filtering, such as price sorting (Alba et al., 1997; Häubl & Trifts, 2000).

Although with a prototypical design, higher processing intensity still may lead to a stronger activation of subjective experiences, these experiences will be less intensive and positive, so activation cannot lead to higher retail patronage intentions. With this reasoning, we predict that the fit between a prototypical design and a customer's shopping orientation does not have a positive effect on patronage intentions, irrespective of processing intensity. We thus derive our main hypothesis:

H1. For store-oriented customers, a homogenous design leads to (a) higher patronage intentions and (b) a higher choice probability for the online shop than does a prototypical design if high processing intensity is activated.

3. Overview of empirical studies

We test our conceptual model and hypothesis in three studies, which we summarize in Table 1. In Study 1, we develop and measure a scale to assess store- and web-based orientations as latent cognitive shopping orientations. We manipulate schematic, highly controlled visual cues in the web design, according to either a homogenous or a prototypical design, and we manipulate processing intensity by imposing non-competitive pricing (i.e., higher prices than competitors'). As the dependent variable, we measure online shop patronage intentions.

Study 2 features a more realistic scenario in which customers evaluate product brands, and the design adopted by a real retailer is manipulated subtly in the background. To activate customers' processing intensity, we manipulate the task involvement. Then, to measure online shop patronage, we provide an incentive-compatible choice that conceals its true purpose.

Study 3 manipulates the designs of both the physical store environment and the online environment for a multichannel retailer. Although consumers' shopping orientation schemas are latent, they might be induced by the situation (e.g., Fitzsimons, Chartrand, & Fitzsimons, 2008). Therefore, we investigate whether a store-based orientation can be induced by exposing customers to highly visible physical cues in the store. Processing intensity is high and constant across all

conditions of Study 3, which features a high task involvement manipulation for all respondents. As online patronage measures, we use both intentions and an incentive-compatible choice measure.

4. Study 1

4.1. Pre-study

4.1.1. Scale development

In a pretest, we developed measurement scales for store-based and web-based orientations. From cognitive schema research, we identified facets of cognitive orientation that we transferred to the context of web- and store-based orientations, in line with Churchill's (1979) deductive procedure. To reflect general experiences during online shopping, we generated an initial set of 12 items that captured different facets of web- and store-based orientations. Then to account for content and face validity, 15 people with academic backgrounds in consumer research evaluated the items' comprehensiveness, clarity, and conceptual fit (Nunnally & Bernstein, 1994). All judges agreed that 8 items from the initial set clearly represented the assigned orientation schema. We also assessed their individual interpretations with a think-aloud method (Russo, Johnson, & Stephens, 1989). The elicited free associations led us to adjust the wording of 3 items to improve their comprehensiveness, resulting in a refined set of 8 items.

4.1.2. Pretest

Using a sample with 1,020 respondents from an online panel (49% women, 46% younger than 35 years), we assessed the validity and reliability of the store-based and web-based orientation scales. A confirmatory factor analysis (CFA) revealed that the loadings for both orientation scales achieved convergent validity (Nunnally & Bernstein, 1994). The two scales also were internally consistent, with sufficiently high Cronbach's alphas (store-based $\alpha = .91$; web-based $\alpha = .83$). The composite reliabilities (CR) and average variances extracted (AVE) provided further evidence of reliability ($CR_{STORE} = .91$; $CR_{WEB} = .83$; $AVE_{STORE} = .71$; $AVE_{WEB} = .55$). The squared correlation between constructs was less than the AVE for each construct, in support of discriminant validity. Finally, the latent factor model with two factors offered sufficient fit (confirmatory fit index = .979; Tucker-Lewis index = .970; root mean square error of approximation = .049; standardized root mean residual = .038; $\chi^2 = 66.27$; d.f. = 19) (Baumgartner & Homburg, 1996).

4.1.3. Study set-up

To construct the homogenous and the prototypical design stimuli for Study 1, we also asked the pretest participants to indicate the retailer they knew best that operates both physical stores and an online shop. They then rated the perceived homogeneity and prototypicality of this retailer's online shop and named two attributes that most reminded

Table 1
Overview of empirical studies.

	Study 1	Study 2	Study 3
Main objectives	Compare the impact of a homogenous versus a prototypical design ... in a highly controlled online environment	in a realistic online environment	in a realistic multichannel environment
Sampling frame	Online panel	Online panel	Store customers
Sample size	514	584	156
Dependent variables	Patronage intentions	Incentive-compatible choice	Patronage intentions Incentive-compatible choice
Experimental design of stimuli	2 (homogenous/prototypical design) $\times$ 2 (high/low processing intensity)	2 (homogenous/prototypical design) $\times$ 2 (high/low processing intensity)	2 (homogenous/prototypical design) $\times$ 2 (corresponding/non-corresponding physical cues)
- Design	Schematic cues	Real web design cues	Real web design and store design cues
- Orientation schemas	Latent schema measurement	Latent schema measurement	Situational schema inducement
- Processing intensity	Extrinsic price cues (non-competitive/competitive)	Intrinsic task involvement (high/low)	Intrinsic task involvement (high across all conditions)

them of its stores. Two researchers independently coded the answers to this open question, resulting in nine orientation cue categories: logo 34%, color 28%, structure and arrangement of categories 12%, scope of assortment 10%, advertisements 4%, single-product brands 3%, images and symbols 3%, overall impression 3%, and other 3%.

An analysis of the online shops that earned the highest homogenous design ratings in turn showed that those online shops strongly emphasized the orientation cues mentioned by participants in response to the open question. These insights were used to create five defining orientation cues for the homogenous design (see Fig. 2). Then, for the online shops with the highest prototypical design scores, we analyzed which design cues determined typical web site structures, as established by popular pure Internet retailers. Across these online shops, we identified five online-specific design cues (Fig. 2).

4.2. Method

4.2.1. Experimental design

Study 1 manipulated design and processing intensity in a 2 (homogenous/prototypical design) $\times$ 2 (non-competitive/competitive price) between-subjects design. Store-based and web-based orientations were measured and not manipulated.

4.2.2. Sample

Members of a representative online sample maintained by an international market research agency were randomly selected, with quotas for age, gender, and geographical location, according to the distribution of Internet users. Among the 675 completed surveys, 110 came from respondents who did not pass the instructional manipulation check,

Fig. 2. Stimuli development: Prototypical and homogenous designs.

indicating that they did not read the descriptions (Oppenheimer, Meyvis, & Davidenko, 2009). In addition, we excluded 51 respondents because they interrupted the survey or needed more than 7 minutes to read the stimuli description, indicating they were distracted by other activities. The final sample of 514 respondents included 54% women and a range of ages (24% younger than 30 years; 39% between 30 and 49 years; 37% 50 years or older).

4.2.3. Procedure

Respondents first read a scenario description, which instructed them to purchase a specific cosmetic product from the fictional brand SoulFlower. To account for potential differences in product involvement, they were to imagine purchasing it for a friend. They then read a description of the fictional multichannel retailer Lana, including an illustration of its layout and in-store environment with shelves, which provided a reference for the homogenous design. Next, the respondents considered the e-hoppy website, presented as a popular pure Internet retailer, which served as the reference for a prototypical design.

They were assigned randomly to the homogenous or prototypical design version of Lana's online shop. The same Web design elements appeared in both designs, but we varied the visual emphasis on five distinct design cues (as identified in the pretest), which allowed us to control for potential confounding influences. The other design parameters remained equivalent, such that the sites included the same number of displayed products, same length of text symbols, colors with the same degree of redness, and images with the same attractiveness. Both treatments contained, in the third position of the product display, the SoulFlower cosmetic product that respondents were to purchase (see Fig. 2). In the price competitive condition, its price was the same as on e-hoppy (35.99). For the non-competitive price manipulation, Lana offered the product for 38.99, approximately 8% more than the price on e-hoppy, which is within the range of average price differences for multichannel compared with pure Internet retailers (Ancarani & Shankar, 2004). After these manipulations, respondents answered several questions related to our dependent, independent, and control variables.

4.2.4. Measures

To measure patronage intentions toward Lana's online shop, we used a three-item scale adapted from Baker et al. (2002). We used the store- and web-based orientation scales we developed in the pre-study. To control for potential bias from the design stimuli, due to differences other than the homogenous versus prototypical design, we also included an established, multidimensional, 15-item scale to measure perceptions of navigation (Bart, Shankar, Sultan, & Urban, 2005). Respondents specifically rated their perceptions of the attractiveness of illustrations and the homogeneity of the price and assortment across channels. As manipulation checks for the design, we adapted items from Badrinarayanan et al. (2010) to measure the degree to which respondents perceived Lana's online shop as similar to or different from its physical stores and the prototypical online e-hoppy site. To measure the manipulation of price competitiveness, we asked respondents how expensive the price of SoulFlower offered by Lana was (Janiszewski & Lichtenstein, 1999). All items used 7-point scales. In Appendix A, we provide a detailed overview of the measures.

4.3. Quality of scales and experiment

4.3.1. Scales

In a CFA using maximum likelihood, the store-based and web-based orientation scales showed satisfactory fit indices, within the recommended cut-off criteria (see Appendix B). The Cronbach's alpha value for patronage intentions was also acceptable ($\alpha = .74$).

4.3.2. Control checks

We tested whether the homogenous/prototypical design stimulus influenced design perceptions other than the intended manipulation. The mean differences across the 15 navigation perception items were not significant for concrete perceptions ("The site has legible images, colors, and text"; $t = -.43$, n.s.) or overall impressions ("The site feels warm and comforting"; $t = -.20$, n.s.). The mean differences for the attractiveness of the illustrations and homogeneity of the price and assortment also were not significant (Appendix C).

Fig. 3. Three-way spotlight analysis for online shop patronage intentions.

Table 2
Regression analyses for online shop patronage intentions in Study 1 (N = 514).

Online shop patronage intentions	β	z	β	z
<i>Simple Effects</i>				
Design (Homogenous = 1, Prototypical = 0)	.10	.61	.09	.57
Price (Non-competitive = 1, Competitive = 0)	-.67*	-4.01	-.68*	-4.10
Store-based orientation	.43*	5.48	.38*	8.32
Web-based orientation	.31*	5.12	.23*	2.06
<i>Two-way interactions</i>				
Design $\times$ Price	.29	1.25	.28	1.22
Design $\times$ Store-based orientation	-.05	-.45		
Design $\times$ Web-based orientation			.15	.98
Price $\times$ Store-based orientation	-.20†	-1.85		
Price $\times$ Web-based orientation			.31*	2.07
<i>Three-way interactions</i>				
Design $\times$ Price $\times$ Store-based orientation	.31*	2.01		
Design $\times$ Price $\times$ Web-based orientation			-.57*	-2.77

* $p < .05$. † $p < .10$.

4.3.3. Manipulation checks

The mean differences between a homogenous and a prototypical design were significant, in the proposed directions, for both similarity to a physical store ($M_{\text{Homog}} = 5.01$; $M_{\text{Proto}} = 4.69$, $t = 3.43$, $p < .05$) and similarity to a prototypical online shop ($M_{\text{Homog}} = 3.60$; $M_{\text{Proto}} = 4.24$, $t = -5.75$, $p < .05$). The manipulation of non-competitive prices produced perceived differences in expensiveness ($M_{\text{Non-Competitive}} = 4.88$; $M_{\text{Competitive}} = 1.96$, $t = 19.54$, $p < .05$). We found no confounding influences between the manipulations for the similarity measures related to the physical store ($M_{\text{Non-Competitive}} = 4.87$; $M_{\text{Competitive}} = 4.84$, $t = .30$, n.s.), the prototypical online shop ($M_{\text{Non-Competitive}} = 3.85$; $M_{\text{Competitive}} = 3.98$, $t = -1.08$, n.s.), or expensiveness ($M_{\text{Homog}} = 3.55$; $M_{\text{Proto}} = 3.36$, $t = .95$, n.s.). Nor did the design manipulation affect the measures of Web-based orientation ($M_{\text{Homog}} = 4.74$; $M_{\text{Proto}} = 4.76$, $t = -.16$, n.s.) or store-based orientation ($M_{\text{Homog}} = 3.47$; $M_{\text{Proto}} = 3.60$, $t = -.86$, n.s.).

4.4. Results

The regression analysis included patronage intentions as the dependent variable and design (1 = homogenous, 0 = prototypical), price (1 = non-competitive, 0 = competitive), and mean-centered shopping orientations as independent variables. We analyzed two models each for store- and web-based orientation, with the three-way interactions of design, price, and shopping orientations, as well as all two-way interactions (see Table 2). From this analysis, we identified significant three-way interaction effects for both store-based ($\beta = .31$, $z = 2.01$, $p < .05$) and web-based ($\beta = -.57$, $z = -2.77$, $p < .05$) orientation, which we analyze further in a spotlight analysis (Fig. 3).

For store-oriented customers, a homogenous design increases patronage intentions more than a prototypical design, but only if prices are non-competitive ($\beta = .79$, $t = 3.36$, $p < .05$; see left side of Fig. 3), in support of H_{1a} . A prototypical design also has a detrimental effect on the patronage intentions of customers with a low web-based orientation if prices are non-competitive ($\beta = .90$, $t = 3.89$, $p < .05$; see right side of Fig. 3).

4.5. Discussion

These findings suggest that a homogenous design increases online patronage intentions of store-oriented customers if their processing intensity is activated by extrinsic cues, such as non-competitive prices. In contrast, the prototypical design does not increase patronage intentions and even can be detrimental if it does not fit to a customer's schema. To move beyond this hypothetical, scenario-based experiment, in the next two studies, we manipulate the online design of a real retailer and use a

sample from its target market. We also study an incentive-compatible choice, as a dependent variable with real implications for participants, instead of testing their patronage intentions. Finally, whereas in Study 1, we used non-competitive prices as situational extrinsic cues to induce higher processing intensity, we next adopt a direct treatment of processing intensity by manipulating customers' intrinsic task involvement.

5. Study 2

5.1. Method

5.1.1. Experimental design

We again conducted a 2 (homogenous/prototypical design) $\times$ 2 (high/low processing intensity) experiment in the context of a cosmetic product evaluation and measured store-based and web-based orientation as in Study 1.

5.1.2. Sample

In collaboration with a real retailer, we identified a sample of potential customers, which a market research agency then recruited online. In the sample, 131 of the 726 respondents were screened out on the basis of the instructional manipulation check (Oppenheimer et al., 2009). After passing this check, 8 additional respondents did not complete the survey and 3 people were excluded because they took more than 25 minutes to read the treatment procedure or more than 50 minutes to complete the overall survey, indicating that they were distracted. The final sample was 584 participants who were representative of female customers buying cosmetic repair products from this specific retailer (17% younger than 30 years; 33% 30–49 years; 27% 50–59 years; 23% older than 60 years).

5.1.3. Procedure

Respondents were invited to participate in a study of cosmetic products. We used a task involvement manipulation to prime high or low processing intensity (e.g., Litt & Tormala, 2010). In the high processing intensity condition, participants saw a headline "YOUR OPINION COUNTS," then read that they could participate in the creation of cosmetic products and that the survey would investigate their preferences for future products. In the low processing intensity condition, participants read that they would participate in a broad, mass investigation, in which their individual answers would have no direct impact but might play a minor role in advertising planning.

The "background information" included a short description of a multichannel retailer with different brands in the assortment, along with pictures of the retailer's in-store environment, including the shelf display for each noted brand. On the following page, a short direction asked respondents to evaluate the brands about to be shown, independent of their attitude toward the retailer. We then repeated the high or low processing intensity conditions (Litt & Tormala, 2010). Finally, products from three brands appeared on the three subsequent pages, in random order. Depending on the condition, the products were embedded in an online shop with either a homogenous or a prototypical design. The orientation cues for the homogenous and prototypical designs were similar to those in Study 1 but adapted to the design context of the actual retailer.

5.1.4. Measurement

Respondents answered several questions about the three brands that served as distraction tasks. They also provided their preference for cosmetic attributes, such as scents. Then, out of appreciation for their responses, which would help the firm develop its cosmetic assortment, they were informed that five vouchers, valued at 50 Euro each, would be raffled. We used an incentive-compatible choice to measure their patronage, because respondents could choose to receive a voucher for the multichannel retailer's online shop or for Amazon if they won.

In the next section of the survey, consumers indicated how frequently they used the multichannel retailer's online shop and Amazon in the past (see [Appendix A](#)), noted their cosmetics and channel experience, and completed the store-based and web-based orientation scales (see Study 1). The Study 1 scales served as design manipulation checks. As the manipulation check for processing intensity, we used the five-item scale from [Litt and Tormala \(2010\)](#). To check for perceived differences in web design, we included the five-item web design scale developed by [Wolfenbarger and Gilly \(2003\)](#). All the continuous measures used 7-point scales. Of the socio-demographic variables, we used income in this analysis as a control. Similar to previous research, we standardized it which enables to “zero out” missing values ([Goldfarb & Tucker, 2011](#)). A funneled debriefing section asked respondents about the purpose of the study and the goals it sought to achieve ([Bargh & Chartrand, 2000](#)).

5.2. Quality of scales and experiment

5.2.1. Scale

As in Study 1, the store-based and web-based orientation scales fulfilled all criteria in a CFA that used maximum likelihood ([Appendix B](#)). The reliabilities of the scales used for manipulation checks also were good: similarity to physical score $\alpha = .88$, similarity to a prototypical online shop $\alpha = .91$, and processing intensity $\alpha = .92$.

5.2.2. Manipulation and control checks

Similarity to the physical store was ranked higher for the homogenous design ($M_{\text{Homog}} = 4.81, M_{\text{Proto}} = 4.42; t = 4.06, p < .001$), and similarity to a prototypical online shop was higher for the prototypical design ($M_{\text{Homog}} = 4.18, M_{\text{Proto}} = 4.52; t = -3.15, p < .01$). Customers in the high processing intensity condition reported a higher processing intensity ($M_{\text{High_processing}} = 4.30, M_{\text{Low_processing}} = 3.96; t = 2.85, p < .01$). The manipulations of the online shop design and processing intensity did not confound each other for the measures of similarity to the physical store ($t = -.08, n.s.$), of similarity to a prototypical design ($t = .74, n.s.$), and of processing intensity ($t = .36, n.s.$), nor did the manipulation of the online shop design affect the measures of store-based orientation ($t = 1.33, n.s.$) or web-based orientation ($t = .33, n.s.$). No perceived differences in web design arose between homogenous and prototypical design ($M_{\text{Homog}} = 4.83, M_{\text{Proto}} = 4.84; t = -.11, n.s.$), so no design aspects other than the manipulation of homogenous and prototypical structures were perceived to be different.

5.3. Results

We performed a logistic regression with the incentive-compatible choice as the dependent variable (1 = choice of multichannel retailer, 0 = choice of Amazon). We included the three-way interaction of online shop design, processing intensity, and store-based orientation, as well as all two-way interactions. We also included age, income, and previous usage frequencies of the online shop and Amazon as control variables (see [Table 3](#)). The results revealed a significant three-way interaction ($\beta = .58, z = 2.07, p < .05$). In support of H_{1b} , the slope from prototypical design to homogenous design was positive and significant ($\beta = .81, t = 2.01, p < .05$) for store-oriented consumers if their processing intensity was high (see [Fig. 4](#)). No other slope from prototypical to homogenous design was significant. For web-based orientation, we did not find any significant two- or three-way interactions with online shop design or processing intensity (two-way $\beta = -.19, z = -1.23, \beta = -.17, z = -1.12, n.s.$; three-way $\beta = .10, z = .34, n.s.$).

We also analyzed fluency effects, to assess customers' possible use of naïve theories or implicit assumptions about cause-and-effect links when no real causal relationships exist. On the single-item scale suggested by [Deval, Mantel, Kardes, and Posavac \(2013\)](#), respondents assessed if a high price for the cosmetic product at a retailer indicates a low value for money (1) or high quality (7). This dependent variable, with the same independent variables (as for patronage behavior),

Table 3

Logistic regression analysis for incentive-compatible choice in Study 2 (N = 584).

Incentive-compatible choice of multichannel retailer	β	z
<i>Simple Effects</i>		
Design (Homogenous = 1, Prototypical = 0)	.09	.28
Processing intensity (High = 1, Low = 0)	.25	.84
Store-based orientation	.34*	2.54
Web-based orientation	.06	.71
<i>Two-way Interactions</i>		
Design $\times$ Processing intensity	.14	.33
Design $\times$ Store-based orientation	-.21	-1.04
Processing intensity $\times$ Store-based orientation	-.33†	-1.78
<i>Three-way Interaction</i>		
Design $\times$ Processing intensity $\times$ Store-based orientation	.58*	2.07
<i>Control Variables</i>		
Usage frequency of the multichannel retailer's online shop	.49*	7.22
Usage frequency of Amazon online shop	-.50*	-8.90
Age	.01	.85
Income	.28*	2.29

* $p < .05$. † $p < .10$.

revealed a marginally significant three-way interaction of online shop design, processing intensity, and store-based orientation ($\beta = .25, z = 1.92, p = .06$). When exposed to a homogenous design, store-oriented customers tended to be biased toward interpreting the high prices as a quality signal, in support of fluency effects (i.e., the slope from prototypical to homogenous design is positive but not significant; see [Alter & Oppenheimer, 2009](#)).

5.4. Funneled debriefing

To analyze whether respondents were aware of the design and processing intensity manipulations, we used funneled debriefing. A substantial portion of the open answers to the funneled questions (42%) indicated that the purpose and goals of the study were to gain insights about cosmetic products. Approximately 21% suspected that the study sought to learn more about channel choice (i.e., whether people prefer to purchase online or in physical stores), and 26% offered no answer

Fig. 4. Three-way spotlight analysis for incentive-compatible choice (of multichannel retailer).

or stated that they did not know the purpose of the study. A small share of responses (5%) indicated that the goal was to optimize the online shop, and 2% stated that the study investigated the online presentation of products. However, 4% of respondents also guessed that the purpose was to measure willingness to pay for cosmetics or advertise for the multichannel retailer, two elements we did not manipulate. Therefore, the vast majority of respondents did not recognize the web design as the subject of the investigation.

5.5. Discussion

In line with Study 1, we find that store-oriented customers are more likely to choose a multichannel retailer if they are exposed to a homogenous design and their intrinsic task involvement is high. Study 2 confirms that high processing intensity is a precondition for the positive effects of a homogenous design to arise. It also provides evidence that fluency effects are involved and rules out demand effects as the trigger for the positive effect. Beyond consumers' latent orientation schemas, retail cues might situationally induce shopping orientations. Therefore, with Study 3 we investigate whether visible, corresponding cues in a store environment induce a store-based orientation that in turn influences evaluations of the online shop in a high processing intensity mode. If retailers can shape the cognitive shopping orientations of their customers, they also can influence the impact of homogenous designs.

6. Study 3

6.1. Method

6.1.1. Experimental design

In collaboration with an international multichannel retailer, we performed a 2 (homogenous/prototypical design) $\times$ 2 (corresponding/non-corresponding physical cues) between-subjects experiment. Across all conditions, we induced high processing intensity, because Studies 1 and 2 clearly showed that such intensity was a precondition for the effectiveness of a homogenous design.

6.1.2. Procedure

Participants were recruited from two physical stores of the same retailer, situated in the same shopping district and with a comparable customer base in terms of frequency and heterogeneity. One physical store provided corresponding physical cues to the homogenous design, thus creating an overall multichannel shopping atmosphere in conjunction with the homogenous design. We used this manipulation to induce a situationally determined, store-based orientation. The other physical store had a different shelf design in the typical standard layout of the retailer and was used as a control condition. All products offered on the landing pages of the website were available in both physical stores.

Two interviewers conducted the experiment over the course of one week. To avoid interviewer effects, they switched physical stores after half of each day. Customers who passed the focal shelf were asked to participate in a survey and guided to a place where they could no longer observe the shelf. To start, the interviewer read an involvement induction similar to those of Study 2 ("YOUR OPINION COUNTS..."), to induce greater processing intensity for all participants.² The interviewer then provided a tablet PC and asked the respondent to inspect the website, for as long as needed. The tablet randomly presented a landing page with either the homogenous or the prototypical design. The two versions matched the designs for the cosmetic brand in Study 2. The

landing pages were integrated with the real online shop of the multichannel retailer and contained the same products, as well as identical product images and information.

After respondents signaled that they had finished inspecting the website, they completed the survey. At the end of the survey, each participant received a flyer ("WE HAVE A SURPRISE FOR YOU") that showed a web link to the landing page, which would display a homogenous or prototypical design, according to the design presented on the tablet. We then tracked the web traffic on both landing pages.

6.1.3. Measures

The survey contained a scale to measure online patronage intentions (three items; Baker et al., 2002). We included the incentive-compatible choice from Study 2 (raffled voucher for multichannel retailer or Amazon). After the dependent variables, respondents completed the store-based and web-based orientation scales, as control variables. Because many exogenous factors influence the dependent variables in this retail setting, we also measured other customer-specific covariates, including individual differences in the frequency of visits to the retailer's physical store ("How often do you visit this store per year?"). To control for individual differences in cognitive processing intensity, we measured customers' subjective assessment of the time they spent inspecting the website ("How much time have you spent actively inspecting the website?" 1 = "very short time" to 7 = "very long time"). Finally, we controlled for consumers younger than 19 years of age, using a dummy variable, because the cosmetic brand focuses on repair and care products and thus targets adult customer groups.

6.1.4. Sample

The experiment took place in the women's department of the retailer, and 174 women participated. We used all survey responses that did not contain missing values for the analyses. The incentive-compatible choice was not completed by 12 respondents, and the independent variables contained 6 missing values, so we excluded these 18 respondents. The final survey sample size was 156 women (37% younger than 25 years; 56% 25–54 years; 7% older than 55 years).

6.2. Results

6.2.1. Scales

The store-based and web-based orientation scales (used here as control variables) showed acceptable fit in a CFA using maximum likelihood with robust standard errors (see Appendix B). The reliability of the scale measuring patronage intentions also was sufficient ($\alpha = .79$).

6.2.2. Patronage intentions

We performed a regression analysis with patronage intentions toward the online shop as our dependent variable. The independent variables were a dummy web design variable (1 = homogenous, 0 = prototypical) and a dummy physical cue variable (1 = corresponding, 0 = non-corresponding) and their two-way interaction. The control variables included the measured latent store-based and web-based orientation, frequency of store visits, subjective time assessments, and the dummy age variable.

We found a positive interaction effect ($\beta = 1.04$, $z = 2.10$, $p < .05$), indicating that exposure to corresponding physical cues led to a positive impact of a homogenous design on online patronage intentions (Table 4). In support of H_{1a}, the slope from prototypical to homogenous design was significantly positive if corresponding physical cues appeared in the store ($\beta = 1.01$, $t = 2.91$, $p < .05$) (see Fig. 5). The slope from prototypical to homogenous design was not significant when no corresponding physical cues were provided ($\beta = -.03$, $t = -.07$, n.s.). The results indicate that the high visibility of physical cues in the store situationally induced a store-based orientation that led to a detrimental effect of a prototypical design ($\beta = -.86$, $t = -2.56$, $p < .05$).

² It is conceivable that the procedure itself, with an interviewer and task, already introduced high processing, which reinforces our goal of inducing high processing intensity for this study.

Table 4

Regression analysis for online shop patronage intentions and logistic regression analysis for incentive-compatible choice in Study 3 (N = 156).

Online shop patronage intentions	β	z	β	z
Simple Effects				
Design (Homogenous = 1, Prototypical = 0)	.42	1.63	-.03	-.07
Physical cues (Corresponding = 1, Non-Corresponding = 0)	-.30	-1.20	-.86*	-2.56
Store-based orientation	.15	1.28	.16	1.42
Web-based orientation	.29*	2.38	.30*	2.46
Two-way Interaction				
Design $\times$ Physical cues			1.04*	2.10
Control variables				
Frequency of visits at the physical store	-.00†	-1.66	-.00†	-1.75
Subjective time assessment	.30*	3.44	.31*	3.70
Age	.48	1.58	.47	1.51
Incentive-compatible choice of multichannel retailer				
Simple Effects				
Design (Homogenous = 1, Prototypical = 0)	.83†	1.89	1.27*	2.15
Physical cues (Corresponding = 1, Non-Corresponding = 0)	-.48	-1.11	-.08	-.13
Store-based orientation	.09	.44	.07	.35
Web-based orientation	-.37	-1.60	-.38	-1.61
Two-way Interaction				
Design $\times$ Physical cues			-.88	-.98
Control variables				
Frequency of visits at the physical store	.03	1.27	.03	1.19
Subjective time assessment	.27	1.65	.26	1.59
Age	-1.63*	-2.79	-1.62*	-2.68

* $p < .05$. † $p < .10$.

6.2.3. Incentive-compatible choice

In a logistic regression with the incentive-compatible choice (1 = multichannel retailer, 0 = Amazon voucher) as the dependent variable, the independent variables remained the same. We found a marginally significant, positive main effect of homogenous design on the

incentive-compatible choice of the multichannel retailer ($\beta = .83$, $z = 1.89$, $p = .06$, Table 4).³ The interaction between web design and the physical stores is, however, not significant ($\beta = -.88$, $z = -.98$, n.s.). This result does not support H_{1b} .

6.3. Discussion

A homogenous design leads to higher patronage intentions toward the online shop of a multichannel retailer, compared with a prototypical design, if customers are exposed to corresponding cues in the physical store design. The positive effect of the homogenous design does not occur if no corresponding cues are visible in the physical store. In a post hoc analysis, we found no interaction effects with latent store-based/web-based orientations for any dependent variable ($z = .50$, $z = .62$, $z = -.45$, $z = .27$, n.s.), so visible physical cues in the store appear to induce a store-based orientation that even offsets customers' latent orientations.

In terms of behavioral outcomes, a homogenous design tends to enhance retailer choice. The difference with Study 2, in which we found no main effect of a homogenous design, may stem from the different customer samples (online customers in Study 2, in-store customers in Study 3), such that the in-store customers in Study 3 tended to indicate an inherently higher store-based orientation than the online customers in Study 2 ($M_{\text{Study 3}} = 3.85$, $M_{\text{Study 2}} = 3.57$; $t = 1.78$, $p = .08$).

7. General discussion

Our results contribute to multichannel literature (Neslin & Shankar, 2009; Neslin et al., 2006; Verhoef, 2012) by revealing whether firms should adopt the commonly used prototypical web design or strive for a homogenous web design to create synergies with their physical store designs. In three experimental studies, we find that only the homogenous design creates positive effects for patronage intentions and behavior, mainly when customers have acquired rich shopping experiences in physical environments and exhibit high processing intensity. Our results even indicate that a prototypical design can have detrimental effects for store-oriented customers, which could be a major concern for multichannel retailing as customers increasingly switch across multiple channels (Rigby, 2011). Appealing to this growing customer segment with a store-based orientation may induce new opportunities for multichannel retailers to differentiate themselves by using homogenous designs.

The results of our study also might lead to a different interpretation though. Conceptual articles generally emphasize the importance of channel coordination and synergies (Neslin et al., 2006). Our study suggests more segmented approaches (see also Konuş, Verhoef, & Neslin, 2008), because a homogenous design creates synergies only for store-oriented customers, not web-oriented customers. Multichannel retail strategies should account for the activation level of customers, which may differ between and within them. Our results suggest that a homogenous design is effective only when high processing intensity is activated. With low processing intensity, customers may not access the positive subjective experiences associated with the design cues and thus might not recognize the multichannel retailer's differentiation compared with pure online retailers. These findings contradict paradigms that propose homogenizing channels, irrespective of customers' shopping orientation or the situational context. Cognitive shopping orientations and activation levels thus offer new criteria for web morphing that adapts to individual consumers' cognitive mindsets (Hauser, Urban, Liberali, & Braun, 2009).

³ After leaving the store, 27% of participants visited the landing pages (homogenous 29%, prototypical 25%). Product clicks were significantly higher in the homogenous than the prototypical design condition (homogenous 10%, prototypical 4% of expected page views per condition; $\chi^2 = 3.80$; $p = .05$). The average stay also was longer (homogenous 19 sec, prototypical 10 sec).

Fig. 5. Two-way spotlight analysis for online shop patronage intentions.

In addition to multichannel literature, this study contributes to research about the interaction of situational and latent schema activation (e.g., [Fitzsimons et al., 2008](#)). A common assumption indicates that cognitive schemas are latent, but Study 3 provides evidence that the overall channel design can induce a cognitive shopping orientation. This finding has practical relevance; exposure to highly visible store cues increases the ratio of store-oriented customers to web-oriented customers.

7.1. Managerial implications

Web design can be effective for increasing patronage intentions and behavior. Retail managers who aim to increase their channel synergies can use a homogenous design to serve the important, growing segment of store-oriented customers. The importance of this segment is particularly emphasized in Study 2, where 44% of respondents indicated a high latent store-based orientation (i.e., percentage of respondents indicating at least the scale averages). Although the share of customers with a high web-based orientation (69%) was higher, predominantly store-oriented consumers represent the more valuable customer segment, because they are more than twice as likely to purchase at least monthly from the multichannel retailer.⁴ Serving these customers with homogenous designs can increase their retail patronage and thus potentially improve revenues.

Multichannel retailers might foster the development of store-oriented mindsets across customers by creating an overall channel experience with highly visible, corresponding design cues. In turn, they can increase the patronage intentions of store-oriented customers and dynamically induce a store-based orientation across their remaining customer base. The potential of design as a retail mix instrument also might be strengthened if multichannel retailers complement their homogenous design with other instruments that activate customer cognitions. For example, they might adopt a deliberate non-competitive pricing strategy or include innovative, unique design approaches in their channels ([Noseworthy, Di Muro, & Murray, 2014](#)).

7.2. Research limitations and further research

Several limitations of this study also provide avenues for research. In Study 1, we varied price competitiveness to create higher or lower processing intensity; for retail practice, the combined use of pricing and design demands more detailed investigation. Non-competitive pricing exerts a strong negative effect, which could exceed the positive impact of a homogenous design. Although we investigated a realistic competitive price difference of 8%, we did not determine the influence of other price differences. To clarify the profitability consequences of different designs, researchers should consider different price levels and the resulting margins, the actual presence of store- and web-based customers, and the costs of different design approaches.

We studied online shop patronage, but it also would be interesting to investigate how web design cues affect customer behavior in physical stores. A field experiment might vary the design (e.g., using web morphing for different customer groups; [Hauser et al., 2009](#)), then measure actual effects on store or channel choice and customer spending ([Konus, Neslin, & Verhoef, 2014](#)).

A further question pertains to the contrast between a homogenous and a prototypical design, which seems to depend on the customer context. That is, in an online context (Study 2), store-oriented customers seem to value the homogenous design but do not penalize the prototypical design. Presumably, a (typical) online environment is a salient reference for their comparison. However, in a physical store context (Study 3), store-oriented customers seem to penalize the prototypical design more, perhaps because the physical cues are salient, causing customers

to expect a homogenous design. When more multichannel retailers use a homogenous design, it may evolve from a differentiating factor to a basic requirement before store-oriented customers will purchase. More research on the development of different designs by multichannel retailers and consequences for their effectiveness would be helpful.

Finally, because the effect of a homogenous design is associated with shopping experiences in physical environments, differences may occur across retail categories (e.g., more intense shopping experiences for fashion than for household appliances). The role of design also might depend on the multichannel strategy (e.g., role of physical stores). Design cues are subtle, powerful instruments to guide customer perceptions in multichannel environments. We believe that more research on the interplay of design and cognitive processing in retailing thus is needed.

Appendix A. Scales used in studies

<i>Study 1</i>		
Online shop patronage intentions		
The probability that I will buy "SoulFlower" at Lana's online shop is high.		Baker et al., 2002; Zeithaml, Berry, & Parasuraman, 1996
I am willing to buy products at Lana's online shop. Lana's online shop would be my first choice.		
<i>Study 2</i>		
Naïve theory bias assessment		
A high price of a cosmetics product at a retailer indicates... (a low value for money—a high quality)		Deval et al., 2013
Usage frequencies of the online shop of the multichannel retailer/Amazon		
How often have you used the multichannel retailer's online shop in the past (very seldom—very often)		
How often have you used Amazon's online shop in the past (very seldom—very often)		
<i>Study 3</i>		
Online shop patronage intentions		
I would like to buy the displayed products of the brand at this online shop.		Baker et al., 2002; Zeithaml et al., 1996
The probability that I will buy the cosmetic products at this online shop is high.		
I am willing to buy the cosmetic products at this online shop.		
Frequency of visits at the retailer's physical store		
How often do you visit this store per year?		
Subjective time assessment of inspecting the web site		
How much time have you spent actively inspecting the website? (very short time—very long time)		

Notes: Scales were mean-centered for analyses.

Appendix B. Standardized factor loadings and confirmatory fit measures of store-based and web-based orientation

No	Items	Study 1		Study 2		Study 3	
		Store-based	Web-based	Store-based	Web-based	Store-based	Web-based
1	While shopping on the Internet, I want to navigate in an online-environment that I am familiar with from the store.	.94		.95		.96	
2	It is important to me that an online shop is structured similarly to a store environment.	.88		.91		.76	
3	During my shopping trips on the Internet, I often recall comparable shopping situations in a store.	.89		.89		.75	

⁴ More customers with an equal or higher score on store-based orientation, compared with web-based orientation, reported monthly purchases from the multichannel retailer (store-oriented customers 19.2%; web-oriented customers 8.8%).

Appendix B (continued)

No	Items	Study 1		Study 2		Study 3	
		Store-based	Web-based	Store-based	Web-based	Store-based	Web-based
4	It is easier for me to orient myself in an online shop if the arrangement and presentation of products and categories reminds me of the ones in the store.	.82		.82		.67	
5	In an online shop, I follow an online-specific routine of shopping that is not comparable with shopping in a store.		.80		.82		.86
6	When I use an online shop, I like to act in a completely different manner compared with shopping in a store.		.74		.81		.64
7	In an online shop, I want to make use of new opportunities to do shopping that cannot be realized in a store.		.69		.69		.77
8	When I choose between products on the Internet, I orient myself toward other attributes compared to a decision in a store.		.64		.64		.68
Cronbach's α		.94	.81	.94	.83	.88	.83
Composite reliability		.93	.81	.94	.83	.87	.83
Average variance extracted		.78	.52	.80	.55	.63	.55
χ^2		54.22		72.54		32.53	
Degrees of freedom		18		18		18	
Confirmatory fit index		.987		.983		.963	
Tucker-Lewis index		.978		.973		.942	
Root mean square error of approximation		.063		.072		.072	
Standardized root mean residual		.041		.051		.049	

Notes: Items were measured on a 7-point Likert scale ("strongly disagree" to "strongly agree"). To achieve high goodness-of-fit across studies, the covariance between the residuals of two items (2 and 4) had to be fixed which was consistently applied in the analyses.

Appendix C. Control checks for treatments in Study 1

Items from navigation construct (Bart et al., 2005)	Homogenous Design	Prototypical Design	t
	Mean	Mean	
The site is easy to use.	5.05	5.15	−.85
Overall layout of the site is clear.	5.18	5.24	−.57
The process for browsing is clear.	5.23	5.24	−.07
The site has legible images, colors, and text.	5.19	5.24	−.43
The site uses a layout that is familiar.	4.98	5.00	−.22
The site is visually appealing.	4.76	4.69	.54
The visual appearance and manner of the site is professional (not amateur looking).	4.85	5.02	−1.28
The site displays a high level of artistic sophistication/creativity.	3.81	3.96	−1.18
This site features are state-of-the-art, better than most sites in this industry.	4.63	4.67	−.32
The site visually conveys a sense of honesty.	4.44	4.57	−1.06
The site feels warm and comforting.	4.28	4.31	−.20
The site is engaging and captures attention.	4.20	4.18	.15
The site is entertaining.	3.59	3.75	−1.26
Information on the site can be obtained quickly.	4.76	4.78	−.22
The illustrations for the products and services at the site are helpful in making a purchase decision.	4.59	4.66	−.59
The woman in the illustration is attractive.	4.38	4.53	−1.01
The products in the online shop and store of Lana are the same.	5.67	5.70	−.26
The prices in the online shop and store of Lana are the same.	5.56	5.66	−.71

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