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# Creating customer repurchase intention in Internet retailing: The effects of multiple service events and product type

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ABSTRACT

Internet retailing literature shows that customers' experience with a retailer's website and order fulfillment separately influence repurchase intention. This study examines these two experiences' interactive effects on repurchase intention. Our research model includes a product type as a moderator, because the type of product can likewise affect a customer's experience with the retailer's website and order fulfillment. Results of multiple-group structural equation modeling (SEM) from customer reviews of 306 Internet retailers demonstrate that the interactive effects of a web site experience and order fulfillment are significant. In the interactive mechanism, order fulfillment experience is proven to serve as a proximal cause of repurchase intention. The moderating role of product type is significant as well. This finding suggests that practitioners should have unmatched measures for retailing different types of goods.



## 1. Introduction

As we all witnessed, Internet retailing emerged and then thrived over the past two decades, and its ongoing evolution is a given. In this service sector, creating customer repurchase intention, which reflects customer loyalty, represents a key managerial goal (Reichheld and Schefter, 2000; Parasuraman et al., 2005). Previous studies tell us that customer repurchase intention is created from a retailer's two service events in different settings: online at a retail website and offline for order fulfillment (Heim and Sinha, 2001; Szymanski and Hise, 2000; Rao et al., 2011; Collier and Bienstock, 2006; Parasuraman et al., 2005; Koufaris, 2002; Devaraj et al., 2002). However, it is not clear how the two events interact with each other to create repurchase intention. This study examines the interactive effects of both events on customer repurchase intention.

An Internet retailer's website offers technology-based interaction with online customers with the goal of attracting their attention and collecting orders. The fundamental significance of web interaction has been highlighted by such concepts as "flow," indicating the total sensory involvement with an electronic service channel (e-channel) (Novak et al., 2000; Koufaris, 2002; Gao and Bai, 2014), and "website quality" (Loiacono et al., 2002; McKinney et al., 2002; Kim and Stoel, 2004; Shobeiri et al., 2013), or more broadly, "e-service quality" (Parasuraman et al., 2005; Collier and Bienstock, 2006; Fassnacht and Koese, 2006). These studies suggest that a retailer's website as an e-channel conveys the moment of truth with unique service quality attributes that create customer satisfaction and repurchase intention (Ba and Johansson, 2008; Parasuraman et al., 2005).

In contrast, retailers' order fulfillment requires back-stage operations, with the goal of delivering an item ordered online on time to the customer. Ironically, the use of a website as an advanced digital storefront deepens the dependence of business success on order fulfillment (Maltz et al., 2004; Sousa and Voss, 2006). As evidence, full-scale delivery failures during the holiday season around the new millennium devastated high customer expectations set by digital storefronts, and increased public anxiety over online shopping (Hallowell, 2001; Ricker and Kalakota, 1999; Scheraga, 2000). This industry experience suggests that limiting the scope of an e-service encounter to web interaction risks missing important drivers of customer loyalty (Boyer et al., 2002; Pei et al., 2014; Cao and Zhao, 2004). A sizable number of studies verify that Internet retailers' on-time delivery brings customer satisfaction and repurchase intention (Heim and Sinha, 2001; Collier and Bienstock, 2006; Thirumalai and Sinha, 2005; Davis-Sramek et al., 2008; Rao et al., 2011).

By integrating those two heterogeneous events of service interaction, this study seeks an answer to the question: "What is the exact mechanism for creating customer repurchase intention from these two events?" While significant advances have increased our understanding of these individual events, previous studies highlight only their independent effects, probably because these discrete events occur in different time frames (before and

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after ordering) via different media (a retail website and a delivery partner). However, exploring the interactive effects is important, because customer loyalty is driven by an overall experience with both events rather than with each separately (Sousa and Voss, 2006; Boyer et al., 2002). Finding an answer to the research question would be simpler if one could ignore the impact of product type. Unfortunately, each focal service event is proven to depend upon a product type (Huang et al., 2009; Thirumalai and Sinha, 2005; Pan et al., 2002). In particular, search products and experience products require different web attributes to attract customer attention (Huang et al., 2009; Hsieh et al., 2005). Therefore, our second research question is "Does the mechanism of creating repurchase intention work consistently with different product types? If not, what is the role of product type in the mechanism?"

This study views the overall service interaction as a *sequence* of two events: customers' experience with a retailer's order fulfillment occurs after that with the retailer's website. Therefore, customers' experience with a website will initially create repurchase intention, but the relationship will be affected by the subsequent experience with order fulfillment. Behavioral science principles provide useful insights for the sequence of service events (Verhoef et al., 2004; Hansen and Danaher, 1999; Chase and Dasu, 2001; Cook et al., 2002). The peak-end rule claims that in a chronologically ordered service process, a peak event—the most extreme and thus most memorable—and a final event dominantly influence a customer's evaluation of the process. Given that experience with order fulfillment is the final event in the focal service interaction, its effect on repurchase intention will be significant. Accordingly, the impact of product type can be inferred within the two consecutive events model, wherein each product type uniquely influences the two events. If a product type induces the high peak in the former event, the end effect will be reduced, and vice versa.

To validate the effects of multiple service events and the product type, empirical data are derived from customer reviews of a total of 306 Internet retailers within two retail sectors: clothing/accessories and electronics/computers. These two sectors have many comparable aspects of Internet retailing. A retail website that handles clothing/accessory items might focus on esthetics, while an electronic retail website might focus on presenting information on technical specifications. To answer the research questions, this study defines customer perception of service quality in the two events distinctively. *Order procurement quality perception* refers to customer perception of an Internet retailer's service quality during interaction with the retailer's website, while *order fulfillment quality perception* refers to customer perception of an Internet retailer's service quality during interaction with the retailer's order fulfillment.

This study advances our understanding of the mechanism that creates repurchase intention in multiple ways. An integrative approach enhances previous findings derived from studies that view these two events—order procurement and order procurement—independently. In addition, we investigate the effect of product type in the Internet retail context. This approach increases the generality of our proposed mechanism. Lastly, use of empirical data from customer reviews on actual retailers' service quality complements previous studies on behavioral sciences performed within a controlled laboratory environment.

## 2. Conceptual background

### 2.1. Order procurement quality perception

A retail website is a technological channel for self-service online shopping. Self-service technologies refer to “technological interfaces that enable customers to produce a service independent of direct service employee involvement” (Meuter et al., 2000). Technology dramatically changes the mode of service interaction and the route to customer loyalty. When a customer interacts with a service provider's self-service technologies, customer loyalty to the service provider depends solely on the customer's experience with the technological channel (Bitner et al., 2000; Meuter et al., 2000; Rayport and Jaworski, 2004). Applied to Internet retailing, customer repurchase intention largely depends on a customer's experience with a retailer's website.

A retail website drives a more complicated interaction than simple self-service technologies like an ATM machine outside a bank or pay-at-the-pump terminals in a gas station (Cho and Menor, 2010). This complexity explains the great diversity of e-service quality factors in the literature that reflects varied customer expectations from a retail website (Rowley, 2006). Parasuraman et al. (2005) find four dimensions of e-service quality, which they term E-S-QUAL: efficiency, system availability, privacy, and fulfillment. Among them, the first three are based entirely on web features. Collier and Bienstock (2006) reduce potentially numerous e-service quality dimensions to two, process quality and outcome quality, and explain that web features, such as web design and web information, are concentrated on the process quality dimension. Rowley's (2006) extensive literature review finds numerous studies on e-service quality, with each suggesting different web features as e-service quality components.

Those diverse web features can be classified as basic or specific. Basic web features represent common requirements for every website. Web esthetics and navigation characteristics are basic web features that contribute to establishing a comfortable web environment (Fassnacht and Koese, 2006), and to producing an enjoyable web experience (Mummalaneni, 2005; Loureiro and Roschk, 2014). Novak et al. (2000) and Koufaris (2002) argue that these basic web features serve to stimulate web users' holistic sensations and guide web users to total sensory involvement, a state that produces repurchase intention (Gao and Bai, 2014). In contrast, specific web features depend on a precise website goal. Internet retailing requires such web features as product selection and product information, which Szymanski and Hise (2000) term merchandizing features. Empirical evidence shows that those merchandizing features influence customers' product choices (Lurie and Mason, 2007), and repurchase intention (Heim and Sinha, 2001; Kim and Lennon, 2008).

### 2.2. Order fulfillment quality perception

From a service taxonomical perspective, order fulfillment belongs to the group of services called quasi-manufacturing, which is characterized by low customer contact and thus a high requirement for efficiency (Chase, 1978). Time-based operational competence in the level of supply chains is required to increase efficiency (Cho and Menor, 2012), which produces a positive customer perception of the retailer's order fulfillment (Cao and Zhao, 2004). From an industrial marketing perspective, Bienstock et al. (1997) note that the quality of physical distribution can be measured by multiple dimensions, such as timeliness, item availability, and order condition.

Order fulfillment in Internet retailing involves customized order handling, including picking, packing, and delivering in small quantities along retail supply chains. However, the literature shows that Bienstock et al.'s (1997) dimensions of physical distribution quality are applicable to Internet retailing as well. In addition, there is considerable evidence that those order fulfillment quality dimensions create customer repurchase intention (Heim and Sinha, 2001; Parasuraman et al., 2005; Rao et al., 2011). Parasuraman et al. (2005) highlight the importance of order

fulfillment by the "fulfillment" dimension, which refers to "the extent to which the site's promises about order delivery and item availability are fulfilled". The E-S-QUAL that includes the fulfillment dimension positively affects repurchase intention. Heim and Sinha (2001) also empirically validate that offline factors, such as on-time delivery, item availability, and ease of return, as well as web features, strongly influence repurchase intentions in Internet food retailing.

Among such operational drivers of e-service quality, item availability in a retailers' inventory is a critical measure of order fulfillment quality, because it ensures on-time delivery. Cao and Zhao (2004) empirically verify that Internet retailers who use a positive inventory policy attract more positive customer evaluations. In the study, the availability of retailers' order tracking systems to customers is also highly associated with positive retailer evaluations. However, as Raman et al. (2001) notice in their study of a leading retailer, inventory records within a retail store are infamously inaccurate. According to their study, inaccuracy occurs more than 65% of the time, with an average of a 35% difference from a retailer's target inventory level. These findings indicate that inaccurate inventory can result in delaying order shipping, which in turn decreases customer repurchase intention. In this regard, Rao et al. (2011) find that poor inventory management practices reduce customers' repurchase behavior. Their longitudinal study empirically verifies that a previous experience with an Internet retailer's delivery failure increases customer order anxiety, and decreases both the repurchase order frequency and order size from that particular retailer.

### 2.3. Product type

Far before the Internet era, Nelson (1970) differentiates between two groups of products, search products and experience products, based on the economic evaluation of information asymmetry (Stigler, 1961). This classification framework has been widely applied to studies in the retail context, including Internet retailing. Search products represent a type of goods whose quality information is worth searching for prior to a purchase, because a marginal return for information searching is higher than the cost involved. In contrast, experience products do not reward information searching as search products do, because consumption or experience with the products is the only way to evaluate their quality.

Huang et al. (2009) extensively examine different web interactions between search and experience products. They find that search products require each online shopper to travel through more web pages prior to each purchase than experience products by 51% (on average, 79.04 pages for a search product vs. 52.46 pages for an experience product), while experience products require each online shopper to spend more time per web page by 19.5% (on average, 54 s for experience product vs. 44 s for search product). According to the authors' findings, search product shoppers may need to look through different web pages to examine and identify goods online, but may not need to linger on each web page, given that information on the pages is relatively clear compared to that of experience products. This unmatched online behavior appears to result from different factors. Hsieh et al. (2005) find that search product shoppers are highly motivated by financial incentives such as special price offers, while experience product shoppers are highly influenced by the opinions of other customers available through electronic word of mouth (eWOM), the customer-to-customer information shared online (Park and Lee, 2009). Because a search product is easily identified online, the major concern of online shoppers might be buying the product at a low price. This concern differs from that generated by assessing an experience product, in which identification regarding quality, price, and product specifications is challenging in the purchase stage, such that shoppers may want to rely on eWOM.

However, several authors argue that applying the framework established before the Internet era to an Internet retail context is problematic, because information asymmetry, which serves as a classification criterion, has been dramatically diminished by the Internet. As a result, experience products have been rapidly transformed into search products (Sinha, 2000). In this regard, Klein (1998) predicts three major drivers of this transformation before the new millennium, which are very relevant today: 1) an easy search for product information via the Internet, 2) an effective emphasis on search information by retailers' websites, and 3) a virtual experience, such as today's open-source software or online reviews from consumers who have used the experience products. Combined, the three drivers blur the boundary between search and experience products. As a result, the old classification framework lost a significant amount of face validity after the Internet was introduced, and remains ambiguous today. For instance, shoes are classified as a search product (Huang et al., 2009), while clothing is classified as an experience product (Girard et al., 2002). Similarly, radios and cell phones are classified as experience products, while computers are classified as search products (Girard et al., 2002, 2003).

Alba et al. (1997) point out another problem of using the old framework. They argue that each item has all the attributes required for being classified as both a search and an experience product, and that retailers' websites can change the formulation of the two categories to best attract online customers, which is akin to the second driver described by Klein (1998) above. However, one critical aspect of product type on Internet retailing is online product identifiability. Some items like clothing/accessory products have low identifiability because face-to-screen interaction is not sufficient for identifying a product's complete features. In contrast, items like electronics and computers have high identifiability, because detailed technical specifications for an item are available online that are useful in identifying the product's features. Therefore, in the context of Internet retailing, a clothing/accessory product is somewhat closer to an experience product by Nelson's (1970) classification, while an electronic/computer product is likewise closer to a search product.

## 3. Hypothesis development

Based on behavioral sciences, this study proposes the mediating role of order fulfillment quality perception and the moderating role of product type in creating repurchase intention. The research model is summarized in Fig. 1.

### 3.1. Order fulfillment quality perception as mediator

Behavioral scientists define a service process as a sequence of events (Verhoef et al., 2004; Hansen and Danaher, 1999). From a customer standpoint, interactions with retailers' websites and order fulfillment represent two major events in Internet shopping, which determine repurchase intention. Two events in sequence create the mediation effect of the second event on the relationship between the first event and repurchase intention, because the effect of the former is intervened by the latter (Baron and Kenny, 1986). Web interaction can influence repurchase intention directly, but an evaluation of the overall process comes only after a customer has experienced a retailers' order fulfillment, where the intervention occurs.

Different analogies have been used to explain a mediation effect. Baron and Kenny (1986) explain that a mediator intervenes between input and output, much as an active organism does

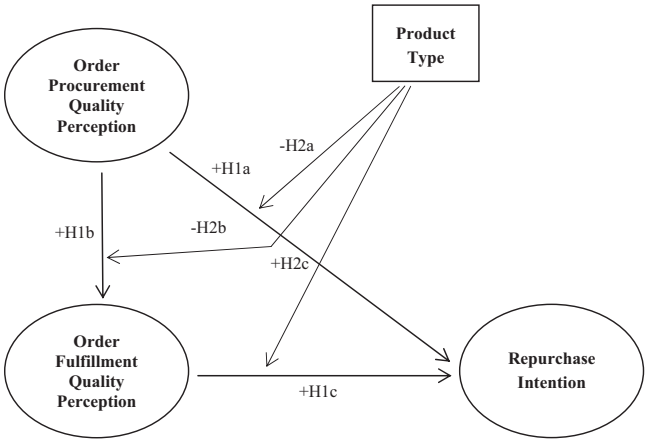


**Fig. 1.** The proposed research model.

between stimulus and response. Collins et al. (1998) use the analogy of dominos to explain mediation within the concept of proximal cause. In their analogy, the proximal cause of each domino's fall is not the first domino, but the one just before it, which is the mediator. Those analogies suggest that mediation leads to a causal model in which a chronological order determines the direction of intervention (Wu and Zumbo, 2008). According to the mediation mechanism, a significant relationship between two variables, the predictor and the outcome, becomes substantially weakened or is completely eliminated by introducing a mediator that has strong relationships to those variables (Baron and Kenny, 1986). The mechanism is illustrated in Fig. 1 by two relationships, indicated by H1b and H1c. Previous studies have established the strong individual effects of order procurement quality perception (H1a) and order fulfillment quality perception (H1c) on customer loyalty. However, the mediation mechanism in our interactive model strongly supports H1b and H1c, because order fulfillment quality perception is a proximal cause of repurchase intention. Accordingly, H1a is expected to become weakened or vanish in the presence of the mediator.

Behavioral science principles are useful for explaining the mediation mechanism. Chase and Dasu (2001) summarize the applications of behavioral sciences to service operations with several principles, including a strong end, an early negative experience, and the segmentation of a positive experience. These principles suggest that all memories from a sequence of service events are not equally important in creating a memorable customer experience. Based on this view, behavioral scientists suggest engraving salient positive memories within customer psychology by manipulating the positive-negative pattern in the sequence and the final event (Chase and Dasu, 2001; Cook et al., 2002; Hansen and Danaher, 1999). The term “the peak-end rule” simplifies those principles (Verhoef et al., 2004; Do et al., 2008; Kahneman, 1994). The rule explains that the peak and the end have stronger influences than other service-related events on the service outcome. Applied to the focal service context, customer experiences with retailers' order fulfillment as the “end” are expected to play a crucial role in producing repurchase intention, which explains why the relationship H1a is weakened or vanishes and the relationship H1c is strengthened after the mediator has been introduced. The peak-end rule differentiates the role of retailers' order fulfillment from retailers' websites, and explains the strong-end effect of order fulfillment quality perception.

In addition to H1a and H1c, the linear path from order procurement quality perception to order fulfillment quality perception (H1b) initiates the mediation effect, which is driven by the chronological order of two events. The time period between web interaction and order fulfillment interaction is critical for the mediation path because, during this period, order procurement quality is perceived, and order fulfillment quality is predicted, by customers. Collier and Bienstock (2006) validate that the web experience develops customers' expectations of the subsequent order fulfillment, which influences customers' perceptions of order fulfillment quality. Likewise, Rabinovich et al. (2008) claim that the promised order fulfillment performance presented on retailers' websites generates customers' expectations regarding order fulfillment. Those studies provide strong evidence of the mediating role of order fulfillment quality perception.

**H1.** Order fulfillment quality perception mediates the relationship of order procurement quality perception to repurchase intention.

**H1a.** Order procurement quality perception has a positive effect on repurchase intention, but the effect is weakened by the introduction of order fulfillment quality perception.

**H1b.** Order procurement quality perception has a positive effect on order fulfillment quality perception.

**H1c.** Order fulfillment quality perception has a positive effect on repurchase intention.

### 3.2. The effect of product type

To explain the moderating effect of product type in online retailing, this study proposes the concept of electronic product identifiability (EPI), defining it as the extent to which a product's exact features or specifications can be identified on an e-channel. As discussed earlier, clothing/accessory products have low EPI, while electronics/computer has high EPI. We argue that shopping for a low EPI item on a retailer's website requires that the customer engage in a more intense web interaction than is required for shopping for a high EPI item.

Indeed, interaction intensity will differ by EPI. For product identification, a retail website offering low EPI products encourages intense interaction with online shoppers. As Huang et al.'s (2009) study suggests, online shoppers who buy low EPI products like clothing/accessories will take more time in each retailer web page to identify and match a retail item's individual features or specifications with their personal preferences. This intense interaction is often facilitated by sophisticated web technologies. For example, some clothing retailers (such as Joy of Clothes, http://www.joyofclothes.com/) use a virtual fitting tool that allows customers to select garments based on their exact height, body shape, hairstyle, and skin tone. In addition, retailers handling low EPI goods should use menu bars and other web functionalities effectively to foster intense web interaction. This suggestion is somewhat different from that accorded retailers selling high EPI products like electronics/computers, where product identification is done by customers reading technical specifications online. In fact, low product identifiability remains the major challenge of Internet retailing, which explains why online shoppers want to “feel” physical surroundings in retailers' websites as if they were in retail stores (Richtel and Tedeschi, 2007).

The difference in interaction intensity by product type creates the moderation effect as illustrated in Fig. 1. The gap of interaction intensity by product type is expected to significantly change how the two events of service interaction influence customer repurchase intention. The influence of order procurement quality perception on repurchase intention (H2a) will be stronger for low EPI items due to the more intense interaction required. This intense interaction will also moderate the relationship between order procurement quality perception and order fulfillment quality perception (H2b). Undoubtedly, experience with the more intense

interaction in the previous event will have stronger effects on customer perceptions of the subsequent event.

The "peak" as the most intense event in the peak-end rule explains the moderating effect. While a customer's experience with a retailer's order procurement occurs before order fulfillment, the earlier event can significantly influence the overall experience by becoming the peak, as the rule claims. Retailers handling low EPI items guide online customers to a more intense web interaction, which raises the possibility of that interaction becoming a peak event. Verhoef et al.'s (2004) examination of service calls in a call center finds that the peak event significantly influences overall customer satisfaction. Baumgartner et al. (1997) also confirm the significant effect of the peak event, as well as the end effect, in customer evaluations of advertising videos. Applying the rule to Internet retailing, this paper posits that retailers handling low EPI goods, due to the goods' requirement for intense web interaction, will show a stronger relationship between order procurement quality perception and repurchase intention, and between order procurement quality perception and order fulfillment quality perception, than will retailers handling high EPI goods. This assertion explains the following negative moderation of product type.

**H2.** A product type moderates the relationships among order procurement quality perception, order fulfillment quality perception, and repurchase intention in H1.

**H2a.** The positive effect of order procurement quality perception on repurchase intention in H1a is stronger in low EPI items (clothing/accessories) than high EPI items (electronics/computers).

**H2b.** The positive effect of order procurement quality perception on order fulfillment quality perception in H1b is stronger in low EPI items (clothing/accessories) than high EPI items (electronics/computers).

EPI is expected to affect the relationship between order fulfillment quality perception and repurchase intention, too, but in a different manner. Because high EPI items require less web interaction, they will lessen the impact of order procurement quality perception on repurchase intention. Therefore, repurchase intention for high EPI items is believed to depend strongly on order fulfillment, which is the final, and potentially the peak, event. Consequently, a positive moderation effect of EPI between order fulfillment quality perception and repurchase intention is highly expected.

**H2c.** The positive effect of order fulfillment quality perception on repurchase intention in H1c is stronger in high EPI items (electronics/computers) than low EPI items (clothing/accessories).

## 4. Methodology

### 4.1. Data source and measurement

In order to test the proposed hypotheses, empirical data of customer experiences with Internet retailers' web services and order fulfillment services, as well as customer repurchase intention, were required. Those data were collected from BizRate.com, a market research firm that rates Internet retailers' service quality by online customer surveys. The BizRate data were particularly useful for this study because they were derived from surveys of individual customers considering the chronological order of their service interactions. BizRate collects data at two different points as a customer shops online. As the first point, an online invitation to participate in the survey is delivered just after the customer places an order. This part of the survey includes questions on web interaction. The second point occurs after the customer has received the ordered item, or after delivery issues, if any, have been resolved. The latter part of the survey focuses on a retailers' order fulfillment, and is conducted by sending a follow-up e-mail invitation to the customer to participate in an online survey. Both parts of the survey use a 10-point Likert scale, with 1 as the minimum and 10 as the maximum, for each service quality or repurchase intention question. The BizRate customer review data have proven very useful for studying customers' interactions with, and their evaluation of, Internet retailers (Heim and Sinha, 2001; Pan et al., 2002; Thirumalai and Sinha, 2005; Srinivasan and Moorman, 2005; Otim and Grover, 2006).

Among different product categories, this study selected two groups: clothing and accessories, and electronics and computers. EPI of the two groups largely differs, given that the exact features or specifications of clothing and accessories are hard to identify online, while those of electronics and computers are easily identified by major technical terms—such as a 14-in. monitor, 4 G RAM for a laptop computer, or simply by a model number. Retailers reported in both groups were excluded from further examination because they handled both high and low EPI items, and thus did not match our research criteria. After the screening process, BizRate data from a total of 306 retailers were collected for testing the hypotheses; 151 came from the clothing and accessories category, and the remainder, 155, were from electronics and computers. Individual websites were visited to confirm their respective categories.

Based on an extensive review of literature, eight questions in the BizRate survey were selected to measure order procurement quality perception and order fulfillment quality perception. The survey asks four questions on order procurement quality perception: two about basic web features: web esthetics (the overall look and design of a website), and the navigation characteristic (the ease of using the website); and two about merchandizing features: product selection, and the clarity of product information (Szymanski and Hise, 2000). Order fulfillment quality perception was assessed based on four questions regarding on-time delivery, item availability, order tracking, and customer service (Heim and Sinha, 2001; Otim and Grover, 2006). To ensure unidimensionality, the principal component factor analysis was conducted; results are presented in Table 1, which finds two latent factors corresponding to order procurement quality perception (component 2) and order fulfillment quality perception (component 1). Repurchase intention was measured by a single survey question: "How likely are you to purchase from this retailer the next time you are in the market to buy this type of product?" Pearson correlation of each pair of measurement items is presented in Table 2.

Item loading and scale reliability indices are summarized in Table 3. Cronbach's $\alpha$ as an index of internal consistency among the items within a scale is satisfactory for both order procurement perception and order fulfillment perception. Scale reliability was

**Table 1**
Results of the principal component factor analysis.

| Items | Component | |
|---|---|---|
| | 1 | 2 |
| Overall look and design of website (Q1) | 0.121 | 0.839 |
| Ease of finding what you are looking for (Q2) | 0.152 | 0.906 |
| Selection of products (Q3) | 0.183 | 0.785 |
| Clarity of product information (Q4) | 0.239 | 0.890 |
| Availability of product you wanted (Q5) | 0.824 | 0.180 |
| Order tracking (Q6) | 0.904 | 0.187 |
| On-time delivery (Q7) | 0.944 | 0.147 |
| Customer support (Q8) | 0.864 | 0.194 |

Varimax rotation.

**Table 2**
Pearson correlation table.

| | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 |
|---|---|---|---|---|---|---|---|---|
| Overall look and design of website (Q1) | | | | | | | | |
| Ease of finding what you are looking for (Q2) | 0.741** | | | | | | | |
| Selection of products (Q3) | 0.493** | 0.653** | | | | | | |
| Clarity of product information (Q4) | 0.712** | 0.794** | 0.699** | | | | | |
| Availability of product you wanted (Q5) | 0.122* | 0.307** | 0.425** | 0.341** | | | | |
| Order tracking (Q6) | 0.309** | 0.304** | 0.285** | 0.370** | 0.689** | | | |
| On-time delivery (Q7) | 0.283** | 0.278** | 0.244** | 0.358** | 0.741** | 0.875** | | |
| Customer support (Q8) | 0.321** | 0.301** | 0.240** | 0.392** | 0.624** | 0.756** | 0.815** | |
| Repurchase intention (Q9) | 0.307** | 0.298** | 0.352** | 0.429** | 0.724** | 0.778** | 0.854** | 0.859** |

* $p < 0.05$.
** $p < 0.01$.

**Table 3**
Results of the scale reliability assessment.

| Construct and items | Mean | S.D. | Item loading* (standardized) | Cronbach's $\alpha$ | Composite reliability | Average variance extracted (AVE) |
|---|---|---|---|---|---|---|
| Order procurement quality perception | | | | | | |
| Overall look and design of website | 8.53 | 0.25 | 0.765 | | | |
| Ease of finding what you are looking for | 8.73 | 0.24 | 0.877 | 0.895 | 0.839 | 0.691 |
| Selection of products | 8.71 | 0.25 | 0.747 | | | |
| Clarity of product information | 8.70 | 0.24 | 0.921 | | | |
| Order fulfillment quality perception | | | | | | |
| Availability of product you wanted | 8.91 | 0.41 | 0.821 | | | |
| Order tracking | 8.78 | 0.49 | 0.882 | | | |
| On-time delivery | 8.90 | 0.47 | 0.924 | 0.918 | 0.936 | 0.786 |
| Customer support | 8.51 | 0.58 | 0.915 | | | |
| Repurchase intention | 8.77 | 0.47 | | | | |

* Item loadings were all statistically significant at $p = 0.01$.

assessed by using a composite reliability measure and the average variance extracted (AVE), and the results showed no problems; all were above the conventional cut-offs of 0.7 and 0.5, respectively. The results of the principal component factor analysis in Table 1, and all significant factor loadings in Table 3, demonstrate high convergent validity, indicating that multiple queries used to measure a construct are in agreement (Campbell and Fiske, 1959). For the assessment of discriminant validity, Chi-squares between the measurement model and a nested model, in which the correlation of a pair of constructs was constrained to equal one, were compared, and were statistically significant (Bagozzi et al., 1991). Before running structural equation modeling (SEM), the normality of each observed variable was checked for skewness and kurtosis using Amos 19.0, which showed no problems in using the maximum likelihood estimation (Kline, 1998).

### 4.2. Hypothesis testing

To test the hypotheses, this study used multiple-group SEM. From a modeling perspective, the proposed research model is close to a moderated mediation model rather than a mediated moderation model (Wu and Zumbo, 2008). To examine such a moderated mediation model, multiple-group SEM is designed in which the moderation effect is tested by multiple group differences. The SEM tool offers advantages over separate analyses, by estimating parameters and testing hypotheses about multiple groups using a single analysis (Arbuckle, 1995). In this study, "Group 1" represents the low EPI sample group from clothing and accessory retailers, and "Group 2" represents the high EPI sample group from electronics and computer retailers. The mediation mechanism posited by the first three hypotheses, H1a, H1b, and H1c, was rigorously tested by comparing path coefficients before and after introducing the mediator variable in both groups. Path coefficients in the results of multiple-group SEM were compared between groups in order to test H2a, H2b, and H2c, which posit the moderation effect by product type. For this purpose, a nested model needed to be formulated by constraining the focal path coefficients assumed to be equal between the high and low EPI groups. The pairwise parameter comparison analysis was used to determine if the three path coefficients in the research model were significantly different between the two groups. This study used Amos 19, which has built-in options for performing multiple group analysis without changing the SPSS spreadsheet.

## 5. Results

Results of the multiple-group SEM are summarized in Table 4. They show that a magnitude of path coefficients differs greatly before and after the mediator variable is introduced in the model. Before mediation, standardized path coefficients between order procurement quality perception and repurchase intention (H1a) are all statistically significant with reasonably high figures (0.530 and 0.322 for Group 1 and Group 2, respectively, all $p < 0.01$). However, by introducing the mediator in the model, they are substantially decreased (0.121 and −0.019 for Group 1 and Group 2, respectively), and only Group 1 remains significant ($p < 0.01$). According to Wu and Zumbo's, (2008) terminology, "complete mediation" occurs in Group 2, while "partial mediation" occurs in Group 1. These results support H1a.

In the mediation model, the path coefficients in subsequent relationships between order procurement quality perception and order fulfillment quality perception, and between order fulfillment quality perception and repurchase intention, are all statistically significant at $p < 0.01$, regardless of the group. Importantly, the *R*-squared increases significantly once the mediator has been

**Table 4**
Results of two-group SEM.

| Performance measure | Path posited | Standardized estimate | *t*-value | Critical ratio (estimate comparison) | Model fit statistics |
|---|---|---|---|---|---|
| Before Mediation | | | | | |
| Group 1 | OPQP→ | 0.530** | 6.413 | −0.970 | $\chi^2$/d.f.= 3.14 ($p < 0.01$), SRMR=0.027, CFI=0.977, NFI=0.967, TLI=0.955 |
| Group 2 | REPINT | 0.322** | 4.110 | | |
| After Mediation | | | | | |
| Group 1 | OPQP→ | 0.121** | 2.567 | −2.275* | $\chi^2$/d.f.= 3.19 ($p < 0.01$), SRMR=0.041, CFI=0.961, NFI=0.944, TLI=0.941 |
| Group 2 | REPINT | −0.019 | −0.533 | | |
| Group 1 | OPQP→OFQP | 0.482** | 5.450 | −0.720 | |
| Group 2 | | 0.362** | 4.246 | | |
| Group 1 | OFQP→ | 0.848** | 14.22 | 2.732** | |
| Group 2 | REPINT | 0.967** | 17.70 | | |

Group 1: clothing and accessory retailers; Group 2: electronics and computer retailers.
Abbreviations: OPQP, order procurement quality perception; OFQP, order fulfillment quality perception; REPINT, repurchase intention.
Critical ratio follows the normal distribution: $P < 0.05$ if |critical ratio| is more than 1.65; $P < 0.01$ if |critical ratio| is more than 2.33, by one-tail test.
The *R*-squared (REPINT): 28.1% (Group 1) and 11% (Group 2) before mediation; 83.4% (Group 1) and 92.2% (Group 2) after mediation.

* $p < 0.05$.
** $p < 0.01$.

introduced, from 28.1% to 83.4% for Group 1, and from 11% to 92.2% for Group 2. These results support H1b and H1c. A comparison of estimated path coefficients between the relationships in H1a and H1c indicates that those in H1c are much higher than those in H1a: 0.848 vs. 0.121 for Group 1, and 0.967 vs. −0.019 for Group 2. These results provide strong evidence that order fulfillment quality perception as the final event in the service process dominantly influences repurchase intention for both groups. Overall, the mediation effect of order fulfillment quality perception is validated.

The results of pairwise parameter comparison presented by the critical ratio column in Table 4 provide empirical evidence of the moderating effect of EPI. The critical ratio of −2.275 for the relationship between order procurement quality perception and repurchase intention indicates that two path coefficients, 0.121 for Group 1 and −0.019 for Group 2, are statistically different ($p < 0.05$). The critical ratio of 2.732 for the relationship between order fulfillment quality perception and repurchase intention also indicates that the two path coefficients, 0.848 for Group 1 and 0.967 for Group 2, are statistically different ($p < 0.01$). The results support H2a and H2c, and confirm the moderation effect of EPI on these two relationships in the model. The other pair of path coefficients of the relationship between order procurement quality perception and order fulfillment quality perception shows that the low EPI group has higher path coefficients as posited in H2b: 0.482 for Group 1 and 0.362 for Group 2. However, the difference is not statistically significant at $p < 0.05$, which rejects H2b. Table 4 also shows that the direct effect of order procurement quality perception on repurchase intention survives in the mediation model in the low EPI group only (path coefficient: 0.121, $p < 0.01$). This result is consistent with the inference that retailing low EPI goods requires intense customer web interaction. Likewise, the significantly higher path coefficient of H2c for the high EPI group is consistent with the inference that the repurchase intention for high EPI items is highly dependent on order fulfillment quality perception. In Fig. 2, results of overall hypotheses tests are summarized on the original research model.

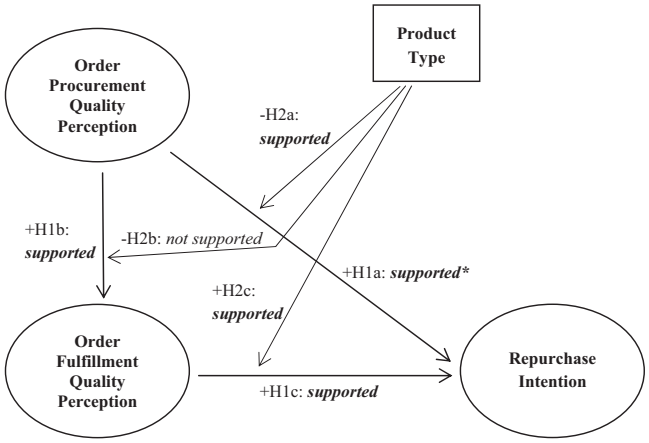


**Fig. 2.** Summary of research results. (*The relationship coefficient was lowered by the introduction of the mediator.).

## 6. Discussion

### 6.1. Theoretical implications

The findings in this study highlight the role of retailers' order fulfillment from two different aspects. First, as a mediator, customer perception of a retailer's order fulfillment quality is proven to serve as a direct cause of repurchase intention. This insight is derived by considering the time-dependence of customer experience. According to the findings, order fulfillment is not only one component of e-service quality dimensions, but also a proximal cause of customer repurchase intention. The mediation path connects the two events of service interaction. Second, order fulfillment as the final event dominates in its influence on repurchase intention. The mediation mechanism itself explains the strong end effect when there are only two events, because the influence of the former will decrease by introducing the latter as a mediator. The strong end effect validated by this study suggests that behavioral sciences can be effectively applied to Internet retailing.

Nonetheless, scrutiny is required in applying behavioral sciences for the following two reasons. First, the sequence of a customer's service experience from web interaction to order fulfillment is already set in the Internet service process. This fixed sequence deviates from some experimentation contexts in previous behavioral science studies, in which the order of good and bad experiences was assumed to be changeable (Hansen and Danaher, 1999; Do et al., 2008). In Internet retailing, order fulfillment consistently represents the final event of the overall customer experience. Second, many previous behavioral science studies assume no interdependence between adjacent events. However, in Internet retailing, web interaction and order

fulfillment experience are inextricably linked, as the mediation path in this study verifies. Hence, customers' experience with Internet retailers' order procurement is not independent of, but rather contiguous to, their experience with the retailers' order fulfillment.

The moderation effect of EPI validated in this study offers plausible explanations as to how product type influences service interactions in Internet retailing. Different levels of need for identifying products online are believed to produce the gap of path coefficients between two product types. Besides path coefficients, the *R*-squared differences between two types offer interesting findings. Before the introduction of the mediator, the *R*-squared for Group 1 is more than twice that of Group 2 (28.1% vs. 11%), which might be explained by the more intense web interaction by Group 1. However, after mediation, the *R*-squared of Group 2 becomes higher (92.2% vs. 83.4% for Group 1). The lower *R*-squared for Group 1 suggests that more complications or unidentified variance are involved in developing repurchase intention for low EPI goods. As a possible explanation, retailing low EPI products might require a more effective web presentation and refined supply chains, given product features and specifications that are difficult to describe. Such retailing differs from handling high EPI products, in which identifiable product features and specifications can be easily transformed into classification dimensions via menu bars on websites and inventory databases in supply chains.

EPI does not significantly moderate one of three paths in the mediation model: from order procurement quality perception to order fulfillment quality perception. The path is statistically significant for both product types, but their difference is not statistically validated, which rejects H2b. This result is unexpected, because more intense web interaction in the low EPI group was expected to strengthen its influence on order fulfillment quality perception. The rationale denying the inference is not clear, which indicates a future research area. However, Huang et al.'s (2009) study might offer a potential answer. As discussed earlier, both the number of travelled web pages, which they call “interaction breadth”, and the interaction time per web page that reflects “interaction depth” characterize the web experience. Importantly, the demands of interaction breadth and depth change in an unmatched fashion: some products demand breadth while others demand depth, rather than demanding both. The unmatched demand could offset the mediation effect of EPI on repurchase intention, which would lead to the effect's insignificance. However, why the offsetting effect is strong only in the relationship between order procurement quality perception and order fulfillment quality perception is unclear. A future dedicated study might identify the cause.

### 6.2. Managerial implications

Findings in this study have three broad implications for Internet retail managers who want to increase customer loyalty through service performance. First, web interaction and order fulfillment occur in different time frames, but the significant mediation mechanism suggests that concerted efforts are required for managing the two. Retail managers should ensure that a positive web experience makes an order fulfillment experience more positive, which is one of the goals of concerted efforts. Different tactics can be employed to achieve this goal. Refining basic and merchandizing features of a retail website is one promising tactic that this study validates. These web features are closely related to customer acceptance of an Internet retail channel. Basic features such as esthetics and navigation characteristics will facilitate a comfortable web environment, which increases a retail web site's ease of use, while merchandizing features such as product selection and product information will increase customer perception of a website's usefulness. Overall, both basic and merchandizing features enhance customer acceptance of a retail website, which positively influences customer loyalty (Davis et al., 1989; Devaraj et al., 2002; Koufaris, 2002). Another useful tactic derived from this study is filling the chronological gap between customer web interaction and order reception by adding small service events, such as emailing status quo delivery performance updates or related product information. Those service events implemented within the interval between customer web and order fulfillment experiences will remind customers of their experience with a retailer's web services. Such additional events will minimize the dilution of a positive customer web experience effect by an order fulfillment experience.

Second, the strong effect of order fulfillment quality perception on repurchase intention suggests that managers should pay primary attention to order fulfillment. This study recommends that Internet retailers ensure timely delivery of ordered items via well-managed inventory, offer an order-tracking tool to customers, and provide appropriate customer support. Among indicators of order fulfillment quality perception that this study uses, customer support appears to have specific implications regarding the strong end effect. When a service failure occurs in order fulfillment for various reasons, from inventory stock-out to logistics glitches, the end event moves to service recovery, and episodes in service recovery will dominantly influence repurchase intention. This insight of end event shift explains why previous studies emphasize the quality of service recovery. These studies preach the importance of service recovery based on their finding that customer loyalty increases to a higher level than that before service failure occurs when recovery service quality is excellent (Holloway and Beatty, 2003, 2008; Parasuraman et al., 2005). Our study offers a plausible reason why: when a retailer commits a service failure, a recovery service becomes an end event, which will dominantly influence customer perception of the entire service process. Managers are highly advised to watch the move of a final event and ensure a positive customer experience out of it.

Third, findings from the moderation effect of EPI suggest that retailers handling low and high EPI products confront different managerial challenges. For retailers handling low EPI products, effective web interaction is a primary challenge; the clear presentation of product information on a website is relatively difficult due to the lack of identifiable product features. As a result, online customers will likely find locating the exact product they want challenging. Eventually, retailers handling low EPI products will confront a higher level of uncertainty in their service process. Returns or customer complaints can be more frequent compared with high EPI products, because customers can correctly evaluate a retail product only after it has been delivered. Therefore, any means of reducing the uncertainty attached to low EPI, like a virtual fitting tool in the clothing sector as discussed earlier, is highly desirable. In contrast, retailers handling high EPI products will confront customers who have extreme sensitivity to retail price. Such customers can easily compare prices for a single product from various retailers due to the product's straightforward specifications. Overall, our study suggests that Internet retail managers experience different managerial challenges handling low versus high EPI products.

### 6.3. Conclusions

This study extends our knowledge of the mechanism of creating customer repurchase intention in Internet retailing. The sequential order of the two events—order procurement and order fulfillment—is proven to be a key determinant in the mechanism. The mechanism begins with the early phase of online shopping, when customers experience a retailer's order procurement from a

retail website. In this phase, customers' perception of the retailer's order procurement quality alone creates repurchase intention. However, this path to repurchase intention is mediated by customers' perception of the retailer's order fulfillment, which occurs later, and thus becomes a dominant factor in the service interaction. This study also investigates how a product type influences the creation of repurchase intention. A product type changes the balance of effects between the early event (customers' perception of a retailer's order procurement quality) and the later event (customers' perception of a retailer's order fulfillment quality), which modifies the routes of creating repurchase intention. This study conceptualizes electronic product identifiability (EPI), which appears to be a key factor that determines the balance. Findings in this study offer the insight that handling low EPI items presents a greater managerial challenge due to such items' unidentifiable nature. This study collected data from two extreme product types, clothing/accessories and electronics/computers, for comparison purposes. Additional dedicated research on a broader variety of products will further illuminate the mechanism of creating customer repurchase intention.

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