

# The challenge of remanufactured products: the role of returns policy and channel structure to reduce consumers' perceived risk

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## Abstract

**Purpose** – While remanufactured products represent an increasingly researched phenomenon in the literature, not much is known about consumers' understanding and acceptance of such products. This study explores this issue in the context of the theory of perceived risk (TPR), investigating return policy leniency and distribution channel choice as potential factors to foster remanufactured products' sales.

**Design/methodology/approach** – This research utilizes an experimental design composed of a pre-test and a scenario-based main experiment to explore how return policy leniency might mitigate consumers' perceived risk and how their related purchase intention differs across two types of retail distribution channel structures (i.e. brick-and-mortar vs. online).

**Findings** – The investigation into the efficacy of return policy leniency within two retail distribution channel settings (i.e. brick-and-mortar vs. online) illustrates that providing a lenient return policy is an effective "cue" in increasing consumer purchase intention for remanufactured products. While prior literature has established that consumers value return policy leniency for new products, the authors provide empirical evidence that this preference also applies to remanufactured products. Notably, that return policy preference holds true in both channel settings (i.e. brick-and-mortar vs. online) under consideration. Additionally, and contrary to the authors' predictions, consumers perceived remanufactured products sold via both channel settings as equally risky, thus highlighting that both are appropriate distribution channels for remanufactured products. Finally, while research on new products provides some initial guidance on consumer perceptions of quality and risk, the study provides empirical evidence into the difference of perceived risk with regard to new versus remanufactured products.

**Originality/value** – By employing the TPR, this research explored the role played by two supply chain management related factors (returns policy and channel structure) in reducing consumer's perceived risk and increasing purchase intention. In doing so, this study answers the call for more consumer-based supply chain management research in a controlled experimental research setting.

**Keywords** Theory of perceived risk, Return policy leniency, Channel, Remanufactured products, Experimental design

**Paper type** Research paper



## Introduction

Companies face increased pressure from consumers about sustainable practices (Foerstl *et al.*, 2015), and thus a commensurate interest has developed to understand and implement a number of supply chain initiatives by industry leaders and academics alike (Liu *et al.*, 2018; Geissdorfer *et al.*, 2017). However, such an initiative will only be successful, especially for manufacturers and retailers, if consumers are willing to purchase products deriving from such an initiative (Guide and Van Wassenhove, 2009). A particularly relevant challenge for the introduction of returned products into the forward flow of a supply chain is the production and sale of remanufactured products (Wang *et al.*, 2018a; Hazen *et al.*, 2017b), which are products that have been restored to operable condition and resemble a new product (Lund, 1984). Remanufactured products undergo rigorous testing and refurbishing before reentering the consumer market (Guide and Van Wassenhove, 2009). While remanufactured products represent an increasingly researched phenomenon in the literature (e.g. Abbey *et al.*, 2015b; Mugge *et al.*, 2017; Xu *et al.*, 2017; Gaur *et al.*, 2018) and an increasing occurrence in practice (e.g. the global market for refurbished consumer electronics is estimated to be \$10 billion (Rallo, 2019), not much is known about what encourages consumers' perceptions and subsequent willingness to potentially purchase such products (Wang and Hazen, 2016). The adoption of a consumer centric perspective where consumers are active, strategic members of the supply chain rather than passive recipients of supply chain management services (Ta *et al.*, 2015; Esper and Peinkofer, 2017), drives the purpose of this paper: to generate insights into consumer understanding and acceptance of remanufactured products in the supply chain.

When considering consumers' involvement and perception toward remanufactured products, previous research has found that consumers associate them with low quality (e.g. Abbey *et al.*, 2015a) and as risky purchase options (Wang *et al.*, 2013, 2018a). Thus, perceived risk of remanufactured products has been identified as a major inhibiting factor for consumers to purchase such products, and commensurately, it is of essence for retailers to adequately manage consumer risks associated with the inspection and purchase of remanufactured products. Retailers can leverage different factors to potentially manage consumer's risk perceptions and subsequently entice consumers to purchase a remanufactured product. Given that the sale of a remanufactured product requires the consideration of both forward and reverse movement in the supply chain, two factors that retailers can use are the focus of this research: return policy leniency and the distribution channel. The return policy leniency captures the reverse perspective in a supply chain and the distribution channel structure captures the multiplicity of the forward perspective.

Every purchase situation is accompanied by some degree of uncertainty about the consequences of the purchase (Van den Poel and Leunis, 1996; Foscht *et al.*, 2013). Based on the theory of perceived risk – known as TPR (Taylor, 1974) – consumers' perception of risk in a purchase situation may lead to anxiety, and subsequently consumers will try to minimize their perceived risk (Mitchell, 1999) through different strategies. TPR (Taylor, 1974) provides an appropriate theoretical lens to examine the impact of return policy leniency and retail channel type as strategies to mitigate the perceived risk and anxiety of remanufactured products as well as to enhance consumers' intention to purchase from a retailer.

Drawing on TPR (Taylor, 1974), we conduct a pre-test and a scenario-based main experiment to address the following research question: *How can return policy and distribution channel structure help reduce the perceived risk of remanufactured products in order to encourage consumers' purchase intention from the retailer?* A retailer's return policy is a major factor affecting a consumers' perceptions and decision-making whether to purchase from a given retailer (Petersen and Kumar, 2009; Bonifield *et al.*, 2010). Additionally, recent industry research (SCQ, 2020) shows that the consumer's return

experience is critical to customer satisfaction, and that the returns process is equal to delivery and payment components within the e-commerce experience. For products where consumers have concerns related to risk and quality, offering the “right” return policy is critical in order to dissuade returns or encourage purchase (Janakiraman *et al.*, 2016). Thus, an understanding of how return policy leniency influences consumers’ perceived risk regarding remanufactured products is clearly relevant to the design and management of supply chain strategy.

Furthermore, as the recent online and traditional offline (i.e. brick-and-mortar) distribution channel environments compete and also blend together (i.e. omni-channel), managing the retail supply chain has become more complicated and challenging (Bernon *et al.*, 2016; Herhausen *et al.*, 2015). However, to be successful within this new retail environment, retailers must engage in the building of omni-channel strategies as a competitive necessity and develop an understanding of how to serve consumers equally well through multiple channels (Zinn and Goldsby, 2017). Viewed from the poles of the channel spectrum, online purchases are thought to be riskier than purchases made at brick-and-mortar stores since consumers do not have the opportunity to inspect the product (i.e. to see and touch the product) (Griffis *et al.*, 2012). Therefore, the channel structure through which a remanufactured product is sold might also play an important role for retailers to manage consumer’s risk perception.

Our research makes several important contributions to the current remanufactured product literature. First, we demonstrate that a lenient return policy can reduce consumer risk perceptions of remanufactured products and thus increase consumer purchase intention. We do so by answering the call of Janakiraman *et al.* (2016) to utilize a controlled experimental research setting. Second, regarding the channel of distribution, although prior research has suggested that the online channel is riskier than the brick-and-mortar channel (Nepomuceno *et al.*, 2014; Griffis *et al.*, 2012) due to the latter’s ability to provide the consumer with immediate “touch and feel” (i.e. the inspection) of a product, our research suggests that this condition might not hold in the context of remanufactured products. Thus, consumer risk perceptions across different distribution channels might be more nuanced than prior literature suggests (Griffis *et al.*, 2012; Nepomuceno *et al.*, 2014). Recent evidence with respect to the consumer’s comfort level with online shopping suggests such a nuanced perspective may well hold true (Zinn and Goldsby, 2017; Oghazi *et al.*, 2018). Third, while research on new products provides some initial guidance on consumer perceptions such as quality and risk (e.g. Rao and Monroe, 1989; Sweeney *et al.*, 1999; Yoo *et al.*, 2000; Zeithaml, 1988), extant knowledge states that the context of “remanufactured products appear to generate perceptions and behaviours that do not fit with the norms of the new product literature[. . .] (Abbey *et al.*, 2017, p. 101).” In support of Abbey *et al.* (2017), we formally establish and provide empirical evidence into the difference of perceived risk regarding new versus remanufactured products. Fourth, we are supported by empirical analysis based upon Taylor’s (1974) TPR to illustrate that consumers’ reduction of purchase uncertainty involves three subdivisions of information handling: information acquisition, information transmission and information processing. Most critical to our study is information processing, which focuses on how consumers evaluate information with regard to the purchase process. Specifically, as per TPR (Taylor, 1974), consumers subjectively evaluate information and utilize “cues” as surrogates for desired information. As such, our results illustrate that consumers use return policy leniency as a “cue” in the form of information for managing their risk perceptions pertaining to purchase intention for both remanufactured and new products. Lastly, by grounding our model in Taylor’s (1974) TPR, we extend the use and relevance of consumer-based decision theories to SCM and develop theory of the middle range (Craighead *et al.*, 2016; Stank *et al.*, 2017; Russo *et al.*, 2020).

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## Literature background

### *Previous research on consumers' perception of remanufactured products*

A recent stream of literature focuses on consumer perceptions of remanufactured products (e.g. Wang *et al.*, 2013; Wang and Hazen, 2016; Abbey *et al.*, 2015b; Abbey *et al.*, 2017), and those perceptions are a major reason why remanufacturing has remained a chiefly untapped opportunity to improve supply chain strategy (Hazen *et al.*, 2017a). As a consequence, prior research has heavily focused on understanding consumers' perceptions of remanufactured products through the use of variables such as intentions to purchase remanufactured products (e.g. de Vicente Bittar, 2018; Gaur *et al.*, 2018; Vafadarnikjoo *et al.*, 2018) or willingness to pay for such products (e.g. Hazen *et al.*, 2012; Abbey *et al.*, 2017; Russo *et al.*, 2019).

Table 1 summarizes the articles analyzed in the literature review and confirms that purchase intention and willingness to pay are the most investigated dependent variables. Almost all the studies are quantitative ones, adopting surveys as the main method and in other cases experiments. Regarding the product type selected in their research setting, the majority of the studies adopt electronics and technology products. None of the studies except very few (namely two, Neto *et al.*, 2016; Xu *et al.*, 2017 that utilize the online channel) precisely identify the channel through which the products are sold in their research context.

Several observations can be readily drawn from Table 1. As illustrated frequently, the topic of product quality is very evident and reflects consumers' perceptions that remanufactured products are of lesser quality than new products (Abbey *et al.*, 2015; Wang *et al.*, 2018a). An investigation of consumers' ambiguity tolerance, perceived quality and willingness to pay for remanufactured products found that as consumers perceive remanufactured products to be of lower quality, they are also less willing to pay for them (Hazen *et al.*, 2012). An exploration of the antecedents of perceived product quality found that consumers' perceptions of higher risk are driven mainly by concerns related to functionality and cosmetic defects for remanufactured products (Abbey *et al.*, 2017).

A second observation, closely related to perceptions of product quality, is that consumers perceive price differently for remanufactured products versus new products. Price is closely associated with, if not reflective of, risk. Because of the lower perceived quality of remanufactured products, their associated lower prices are able to increase product sales (e.g. Abbey *et al.*, 2015, 2017). While consumers do not consider remanufactured products to be perfect substitutes for new ones, they are more willing to pay for remanufactured products than for used ones (Neto *et al.*, 2016). Brand equity (e.g. reputation) and price positively influence remanufactured product sales, whereas consumer environmental consciousness has no impact on sales (De Vicente Bittar, 2018). Similar results were found when a low-price strategy is used to attract potential consumers (Wang *et al.*, 2018a). Additionally, analysis of major motivational factors for buying a remanufactured bike showed that quality and price of the remanufactured bike are ranked, respectively, as the first and the fourth strongest motivation factors for consumers (Vafadarnikjoo *et al.*, 2018).

Less evident in the extant literature is the variable of perceived risk; it has been identified as a major barrier for purchase intentions of remanufactured products (e.g. Wang *et al.*, 2013; 2018a; Wang and Hazen, 2016). This lack of acceptance derives from several factors, for instance, the lack of awareness and a misunderstanding of what remanufactured actually means (e.g. Van Weeldeng *et al.*, 2016), or the perception of quality defects, both functional and "cosmetics" (Abbey *et al.*, 2017). As a consequence, the negative trade-off between perceived risks and benefits often leads to a rejection of such products. Research shows that perceived risk partially mediates the relationship between perceived product quality and perceived value (Wang *et al.*, 2018a). However, only a few studies have explored options to reduce consumer risk perceptions that subsequently might increase purchase intentions for remanufactured products (Wang *et al.*, 2013; Mugge *et al.*, 2017). One option to manage

**Table 1.**  
Results from the literature review on remanufactured products from the consumer's perspective

Authors	Theory	Method	DV(s)	Key findings	Product type	Channel type
Abbey <i>et al.</i> (2015a)	Consumer preferences based on economic utility theory	Experimental study	Attractiveness preference ratings	The article empirically tests the existence of different consumer segments with various preferences for new and remanufactured products. The identification of these segments led to the counterintuitive finding that the price of new products should rise when remanufactured products enter the market.	Technology, household and personal care	Not specified
Abbey <i>et al.</i> (2015b)	Consumer preferences based on economic theory	Experimental study	Attractiveness preference ratings	The study examined remanufactured product perceptions manipulating price discount and brand equity. The results indicate that discounting had a consistently positive, linear effect on remanufactured product attractiveness. On the other hand, the brand equity manipulation proved less important to consumers than specific remanufactured product quality perceptions. The results also show that green consumers typically found remanufactured products significantly more attractive	Technology, household and personal care products	Not specified
Abbey <i>et al.</i> (2017)	Link between CLSC literature and the field of decision theory under risk and uncertainty	Survey and experimental studies	Willingness-to-pay	The study empirically verifies the significance and distribution of discount factors for remanufactured electronics products among consumers	Technology (Apple iPhone)	Not specified
De Vicente Bittar (2018)	Signaling theory	Experimental study	Purchase intention	The study determines that brand equity plays a role in leveraging remanufactured products, even though it is associated with price setting	Technology (laptop)	Not specified

(continued)

Authors	Theory	Method	DV(s)	Key findings	Product type	Channel type
Gaur <i>et al.</i> (2018)	Cultural divergence theory (CDT) and cultural crossvergence theory (CCT)	In-depth interviews	Purchase intention	The manuscript identifies cross-cultural differences for reconstructed products in two countries, USA and India	NA	Not specified
Hazen <i>et al.</i> (2012)	Ambiguity aversion theory	Survey	Willingness-to-pay	This article asserts that the consumer's willingness to pay for remanufactured products is affected by the perception of quality of remanufactured products	Personal electronics; home or business electronics; industrial items; vehicle parts	Not specified
Hazen <i>et al.</i> (2017a)	Signaling theory	Survey	Purchase intention	This study expands the perceived quality of remanufactured products construct and associated measures	Personal electronics; industrial items; vehicle parts	Not specified
Hazen <i>et al.</i> (2017b)	Push-pull-mooring (PPM) theory	Survey	Switching intention	The outcomes advice that consumers' attitude toward remanufactured products plays an important role in predicting consumer switching behavior	Technology (laptop)	Not specified
Jiménez-Parra <i>et al.</i> (2014)	Theory of planned behavior	Survey	Purchase intention	This paper investigates the main determinants of the purchase intentions of potential consumers, consisting of attitude toward remanufactured products, subjective norms, marketing mix variables and motivations to buy a remanufactured product	Technology (laptop)	Not specified
Khor and Hazen (2017)	Theory of planned behavior	Survey	Purchase intention vs. actual purchase behavior	This study researches how consumer attitude, subjective norms and perceived behavioral control affect consumer intention to purchase remanufactured consumer electronic products	Electronic and electrical equipment	Not specified

(continued)

Table 1.

Authors	Theory	Method	DV(s)	Key findings	Product type	Channel type
Michaud and Leerena (2011)	Not specified	Experiment al auctions	Willingness-to-pay	This paper suggests that consumers evaluate remanufactured products less than conventional products, unless they are advised about their corresponding environmental impact	Technology (camera)	Not specified
Mugge <i>et al.</i> (2017)	Engel, Kollatt, & Blackwell (EKB) decision-making model, the Theory of perceived risk, and perceived benefit Information asymmetry	Survey	Purchase intention	This article investigates consumer response toward refurbished smartphones and the impact of different incentives for different customer groups	Technology (smartphone)	Not specified
Neto <i>et al.</i> (2016)		Ebay data set	Willingness-to-pay	The outcomes suggest that remanufacturing does not increase consumer WTP related to used products and that consumers do not consider remanufactured and new products as perfect substitutes	Technology (Ipod)	Online
Russo <i>et al.</i> (2019)	Prospect theory	Survey	Purchase intention, willingness-to-pay and switching intention	The findings show no evidence of the impact of product involvement and gender on the dependent variables, while a significant effect was found for green self-identity, attitude toward bio-based product, age and past purchase experience of green products	Furniture products (chairs)	Not specified
Vafadamiqjoo <i>et al.</i> (2018)	Neutrosophic set theory	Survey	Purchase intention	This paper investigates the leading motivational drivers for purchasing a remanufactured bike based on consumers' and experts' point of view	Bike	Not specified
van Weeldend <i>et al.</i> (2016)	Theory of risk categorization	Interviews	Consumer's acceptance of refurbished products	This article determines the main drivers influencing the consumer's acceptance of a refurbished mobile phone. The results suggest that the majority of consumers do not consider a refurbished item because of a lack of awareness and a misunderstanding of what refurbishment actually means	Technology (mobile phone)	Not specified

(continued)

Authors	Theory	Method	DV(s)	Key findings	Product type	Channel type
<a href="#">Wang et al. (2013)</a>	Theory of perceived risk, theory of planned behavior	Survey	Purchase intention	This article identifies several determinants' influence on purchase intention for remanufactured products, in particular attitude, followed by perceived behavioral control, and indirectly by perceived risk, perceived benefit and product knowledge which are mediated by attitude	Automobile parts	Not specified
<a href="#">Wang et al. (2018a)</a>	Diffusion of innovation theory	Survey	Purchase intention	Findings suggest that perceived risk partially mediates the relationship between perceived quality and perceived value	Automobile parts	Not specified
<a href="#">Wang et al. (2018b)</a>	Regulatory focus theory	Survey	Purchase intention	This paper explores how the information regarding green attributes of remanufacturing products and green certification plays a role in influencing consumer perceptions	Automobile parts	Not specified
<a href="#">Xu et al. (2017)</a>	Utility theory, transaction cost theory and market signal theory	Ebay auction data set and fixed price dataset	Willingness-to-pay	This article studies how e-service offerings in four online transaction phases affect customers' willingness-to-pay for remanufactured products in both auctions and fixed-price transactions	Technology (Apple iPad 2)	Online

Table 1.

(i.e. lower) consumer risk perceptions is to provide consumers with product knowledge (Wang *et al.*, 2013). A second option is providing various incentives to consumers. For example, recent research has explored such incentives for remanufactured smartphones via product features such as an upgraded battery, upgraded internal storage or camera, upgraded performance related to warranty extension; results showed that these incentives reduce the perceived risk (Mugge *et al.*, 2017). But are there additional options to reduce consumer risk perceptions, those not yet addressed by the extant literature?

In sum, based upon our literature review, we believe that the current knowledge base reflects only a part of the challenge of remanufactured product sales. Specifically, the main gap in the literature is to understand (from the retailer and manufacturer perspective) the consumer risk perceptions surrounding remanufactured products. A second gap concerns *how* to reduce those negative perceptions (see Hazen *et al.*, 2017a, b; Wang *et al.*, 2018a). As noted above, the extant literature suggests options such as providing product knowledge (Wang *et al.*, 2013), product performance-based solutions such as warranty and upgrades (Mugge *et al.*, 2017) or seller reputation (Jiménez-Parra *et al.*, 2014; Hazen *et al.*, 2017b). We suggest that an important, yet unexplored, option concerns the manufacturer and/or retailer providing the consumer with the opportunity to *inspect the product* to reduce its specific uncertainty. Importantly, both (lenient) return policy and brick-and-mortar stores can facilitate inspections without adding serious penalties (which is what manufacturers and retailers are trying to offer). However, no research explicitly regarding return policy leniency and distribution channel structure exists (as shown in Table 1) except two studies in the latter category which took place in an online context only (Neto *et al.*, 2016; Xu *et al.*, 2017).

To address these gaps in the literature, we employ the TPR (Taylor, 1974) to explore two risk reduction factors: (1) return policy leniency and (2) distribution (retail) channel structure. A lenient return policy can be applied in multiple retail channel structures: inspection at home (to satisfy the online context) or inspection at the physical store (to satisfy the brick-and-mortar context). Consequently, manufacturers and/or retailers will benefit from understanding how these two factors reduce consumer risk perceptions for remanufactured products (Abbey *et al.*, 2017; Wang and Hazen, 2016; Govindan *et al.*, 2019) in order to enhance purchase intention and ensure the flow of remanufactured products in a supply chain.

### Theory of perceived risk (TPR) and hypotheses development

The concept of perceived risk was originally introduced by Bauer (1960), and numerous studies have since focused on studying perceived risk (see Foscht *et al.*, 2013 for an overview). Perceived risk has been defined as “a consumer’s perception of the overall negativity of a course of action based upon an assessment of the possible negative outcomes and the likelihood that those outcomes will occur” (Mowen and Minor, 1998, p. 176). Thus, for consumers, risk might constitute a form of possible loss, which can be psychological, social, physical, financial or temporal in nature (Kaplan *et al.*, 1974; Roselius, 1971). The TPR posits that consumers will perceive some type of risk during a purchase situation (Taylor, 1974). Specifically, Taylor (1974) also states that such risk (which is equivalent to uncertainty) takes two forms: (1) the uncertainty of the purchase decision outcome and (2) the uncertainty of the purchase decision consequences of a mistake.

For example, with regard to remanufactured products, the uncertainty about outcome (1) is linked with the decision to buy it instead of buying a new product (e.g. due to the uncertainty regarding the consumer’s perception of poor quality and the performance a remanufactured product might have compared to a new one). Considering the other type of risk (2), for a remanufactured product, such risk might be related to the possible consequences

of the choice being negative (e.g. dissatisfaction with the product's performance, the loss and the possible product replacement with related time and effort to return it).

This aspect stresses the relevance of information handling. For example, uncertainty about the outcome can be mitigated through information handling (which, again, concerns the three steps of information acquisition, information transmission and information processing). Uncertainty about the consequences can be lessened by either decreasing the amount at stake or by deferring a decision (Taylor, 1974; Peter and Ryan, 1976). In other words, the purchase decision outcome refers to the results of the decision; the consequences refer to how important the possible loss is. Importantly, the two types of risk vary in proportion *vis-à-vis* the category of product as well as the nature of the order process itself.

Accordingly, TPR implies that consumers will perceive two types of risk pertaining to the outcome and consequence of making a purchase decision between a remanufactured product and a new product which could result in negative consequences (i.e. a loss) for the consumer. As stated before, despite a remanufactured product being restored to a new-like condition and thus in practice it should be considered as the equivalent of a new product, consumers might not be of the same opinion. In fact, literature suggests that consumers' perception is that, compared to new products, remanufactured products are of lower quality (Hazen *et al.*, 2012, 2017a), lower value (Wang and Hazen, 2016; Wang *et al.*, 2018a) and lower performance (Van Weelden *et al.*, 2016). Consumers may have inherently negative perceptions of remanufactured product quality because of uncertainty regarding the prior use of the product as well as the remanufacturing process itself (Hazen *et al.*, 2017a). Such perceptions may lead consumers to also be uncertain about the performance of the remanufactured product (Van Weelden *et al.*, 2016). Thus, according to the TPR, consumers will perceive higher risk for the purchase of a remanufactured product than for a new product. In addition, according to the TPR, the degree of perceived risk can represent an obstacle in a purchase situation, and the extent of perceived risk might have a negative impact on consumer purchase intention for remanufactured products (Wang *et al.*, 2013; Wang and Hazen, 2016). We therefore posit:

- H1. Consumers' perceived risk mediates the relationship between product type (remanufactured vs. new) and their purchase intention from a retailer, such that for remanufactured products, purchase intention from a retailer is lower owing to higher perceived risk.

Next we focus on two factors that retailers might use to decrease consumers' perceived risk and increase consumers' willingness to purchase remanufactured products from them: (1) return policy leniency and (2) distribution (retail) channel structure.

#### *The impact of return policy leniency*

Overall, retailers use return policy leniency as a tool to increase consumer demand for new products (Wood, 2001; Hjort and Lantz, 2016). Return policy leniency "not only [allows] refunds, exchanges, and merchandise credits, but also [imposes] minimal restrictions on consumers making a return" (Bonifield *et al.*, 2010, p. 1059). However, a return policy has far more implications than simply increasing consumer demand. A return policy carries with it an assumption that the offering firm (retailer and/or manufacturer) understands the costs of a chosen policy (Mollenkopf *et al.*, 2011). In particular, the relevant logistics costs, which include transportation, inventory carrying costs, warehousing, customer service and the like, must be measured against the benefits of customer and consumer loyalty, repurchase, branding and purchase intention (Russo *et al.*, 2020). In general, prior research has defined return policies as comprising five factors through which retailers can discourage returns or encourage purchase: (1) monetary leniency (e.g. the possibility to receive a full or partial refund), (2) time

leniency (e.g. the number of days to return the product), (3) effort leniency (e.g. additional actions consumers would need to take, such as filling out a form), (4) scope leniency (e.g. accepting returns on sale items) and (5) exchange leniency (e.g. the offer of cash back or only store credit) (Janakiraman *et al.*, 2016). However, most research has focused only on one or two of these factors (e.g. Bonifield *et al.*, 2010; Huppertz 2007). For example, Rao *et al.* (2018) empirically show that offering a more lenient return time window to consumers positively influences their willingness to purchase from the retailer.

The specifics of return policies can also vary widely (Pei *et al.*, 2014), ranging, for example, from extremely restrictive (“no returns allowed/all sales are final”) to somewhat flexible (“all returns must be accompanied by a sales receipt, and must take place within 30 days of purchase and include a 15% re-stocking fee”) to lenient (“we accept any/all returns and provide a full refund with the sales receipt with no time limit restriction”). A retailer’s return policy offers consumers valuable information that can reduce the potential uncertainty with regard to purchase and its relative consequences. This comfort arises from the knowledge that returning a product to the retailer is possible in case of dissatisfaction with the purchase (Griffis *et al.*, 2012).

Prior research has shown that consumers use a retailer’s return policy as an indicator to evaluate product quality (Wood, 2001) and retailer quality (Bonifield *et al.*, 2010). In addition, previous studies have found that return policy positively affects consumer behavior (Janakiraman *et al.*, 2016), particularly the intention to purchase a product (e.g. Constantinides, 2004; Mukhopadhyay and Setaputra, 2007). Hence, a retailer’s return policy could potentially reduce consumers’ risk perceptions (regarding quality and functionality) and increase purchase intention for a remanufactured product; as a consequence, consumers may have different willingness to pay for a remanufactured product compared to a brand-new counterpart (Guide and Li, 2010; Hazen *et al.*, 2012). Although past studies have focused on the role of return policy to reduce perceived risk for new products, extant studies have not investigated the impact of a lenient return policy on the risk perceived for remanufactured products and the related differences and implications that may result.

Research regarding return policy leniency and related risk perceptions is fairly sparse. Some initial evidence shows that return policy leniency can lower consumer risk perceptions (Petersen and Kumar, 2015). Other research indicates that restrictive product return policies tend to increase consumers’ perceived purchase risk and decrease consumers’ willingness to purchase new products (Bechwati and Siegal, 2005). Conversely, offering consumers return policy guarantees can reduce consumer risk and help retailers enhance customer loyalty and referrals (Petersen and Kumar, 2015; Minnema *et al.*, 2018). In addition, a recent study has explored the role of lenient return policies in building consumer trust and thus reducing online purchase risk (Oghazi *et al.*, 2018).

In accordance with the TPR, a lenient return policy might act as a “cue” during the buying process (Oghazi *et al.*, 2018; Petersen and Kumar, 2015) that will reduce the uncertainty a consumer might experience when purchasing a remanufactured product. Such uncertainty is clearly linked to the consumer’s ability to inspect a (remanufactured) product. As noted previously, a lenient return policy can take the form of “inspect at home” (i.e. to satisfy for a product purchased online), which is similar to the touch-and-feel experience at the physical store. Thus, offering a more lenient return policy might be beneficial in at least two ways, by (1) allowing the consumer to experience (i.e. try) the remanufactured product for a longer period of time and thus decreasing outcome uncertainty and subsequently increasing the willingness to buy it and (2) having fewer negative repercussions (i.e. consequences of the purchase) for the product, manufacturer and retailer if the consumer is not satisfied with the remanufactured product. Hence, a lenient return policy is likely to reduce a consumer’s risk perceptions associated with purchasing remanufactured products and translate into

higher purchase intentions from the retailer. Thus, a lenient return policy could serve as a tool to increase sales by reducing risk perception. Hence, we hypothesize that:

- H2.* For a remanufactured product, a lenient return policy will lower the consumer's perceived risk and subsequently lead to higher purchase intentions than a strict return policy.

#### *The impact of the distribution (retail) channel structure*

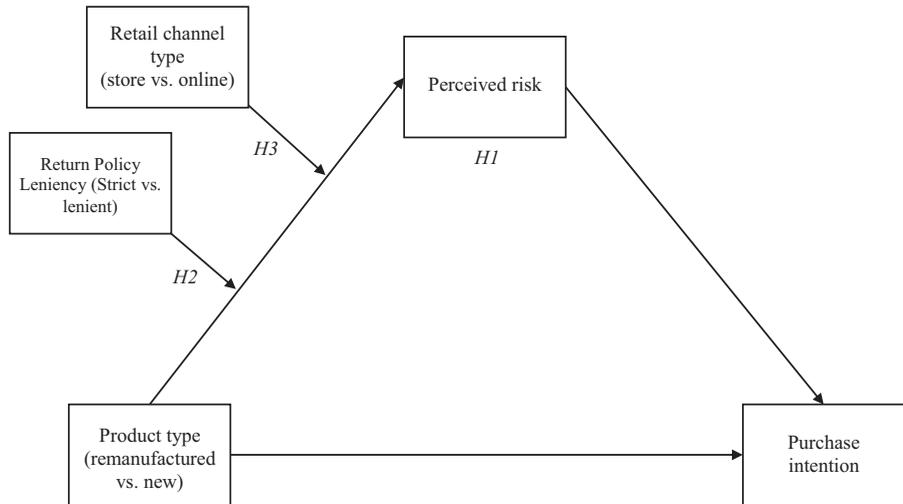
The distribution channel structure through which remanufactured products are sold might inhibit or encourage consumers' purchase of such products from a retailer (Zimm and Goldsby, 2017). As channels of distribution have increased (from traditional brick-and-mortar to pure online, with all the variety of omni-channel retailing), so have complexity and the associated risk conditions (Ishfaq *et al.*, 2016; Herhausen *et al.*, 2015). As such conditions are particularly relevant to remanufactured products and their associated quality (Hazen *et al.*, 2017a), the right channel structure could improve the effective selling of such products via risk reduction.

Consumers purchasing a product from a brick-and-mortar store can observe (i.e. inspect) the product quality and touch the product before making a purchase decision (Griffis *et al.*, 2012). In contrast, in the online retail environment, a consumer cannot directly observe the quality of a product or touch and feel it before making the purchase (Rao *et al.*, 2018; Mukhopadhyay and Setaputra, 2007; Hsiao and Chen, 2012). Under such conditions, a consumer's purchase decision is mainly affected by the expected quality rather than by the actual quality (Janakiraman *et al.*, 2016). Regarding return policy leniency, owing to the different natures of the brick-and-mortar and online channels, consumers have different risk perceptions. Indeed, prior literature suggests that consumers perceive purchasing a product online as riskier than purchasing a product in a store (Pires *et al.*, 2004; Griffis *et al.*, 2012) – a perception due to both mental and physical distance from the product (Nepomuceno *et al.*, 2014).

According to the TPR (Taylor, 1974), the retailer's choice of the distribution channel for the buying process could reduce or increase a consumer's uncertainty when purchasing a remanufactured product. Purchasing a remanufactured product from a brick-and-mortar store allows the consumer to feel and experience the product before making the purchase, which should decrease the outcome uncertainty. Furthermore, the action of salespersons (e.g. helping with information handling, particularly information acquisition and transmission) in the store can reduce this form of perceived risk, particularly when the consumer's product knowledge is limited or when the costs of acquiring this knowledge are too great, as when a consumer has limited time or ability (Mitchell and McGoldrick, 1996). This characteristic of the brick-and-mortar channel should lead to a decrease in perceived risk of purchasing the product from the retailer and thus should then increase purchase intention. Conversely, greater risk pertaining to the online channel (Pires *et al.*, 2004; Griffis *et al.*, 2012) might accentuate consumers' concerns regarding the online purchase of a remanufactured product because consumers cannot touch and feel the product before making the purchase decision (Mukhopadhyay and Setaputra, 2007; Hsiao and Chen, 2012). Thus, a consumer should have higher perceived risk, particularly of outcome uncertainty, when purchasing the remanufactured product through an online channel, which will subsequently decrease purchase intention from the retailer. Thus, we hypothesize:

- H3.* Consumers purchasing a remanufactured product online will have lower purchase intentions than consumers purchasing a remanufactured product in a brick-and-mortar store owing to higher perceived risk.

On the basis of the above theoretical foundations, we developed a conceptual model, shown in Figure 1, which illustrates the relationships between product type (remanufactured or new),

**Figure 1.**  
Conceptual model

perceived risk and purchase intention. Additionally, the model illustrates the potential impact of return policy leniency (lenient or restrictive) and distribution channel structure (online vs. brick-and-mortar) on purchase intention from the retailer via perceived risk.

## Research methodology

### Experimental design

To test our hypotheses, we developed a scenario-based experiment. In line with prior research, this methodological approach is appropriate when investigating consumer issues in supply chain management (e.g. [Esper et al., 2003](#); [Peinkofer et al., 2015](#); [Peinkofer et al. 2016](#); [Ta et al., 2018](#)). The scenarios used in scenario-based experiments require careful design and validation prior to conducting the main experiment ([Rungtusanatham et al., 2011](#)). Hence, we followed the guidelines of [Rungtusanatham et al. \(2011\)](#) to develop our hypothetical shopping scenario used in this research.

In the pre-design stage ([Rungtusanatham et al., 2011](#)), we consulted the return policies of various online retail websites and brick-and-mortar stores to get a sense of the different return policies employed in the retail industry. In addition, we also consulted the return policy literature to identify the different components of return policies that have been used in prior research. Based on this review, we decided that the return policy should represent all five criteria related to return policy leniency as defined by [Janakiraman et al. \(2016\)](#). We also considered prior experimental literature that focused either on new or on remanufactured products ([Abbey et al., 2017](#); [Hazen et al., 2017](#)) and the online or brick-and-mortar channel (e.g. [Esper et al., 2003](#); [Peinkofer et al., 2015](#); [Peinkofer et al., 2016](#)) to get a sense of how prior research integrated these factors into their experimental design.

In the next stage, the design stage, we developed the common (held constant across all experimental conditions) and experimental modules (varies across the conditions) ([Rungtusanatham et al., 2011](#)). In line with prior research on remanufactured products (see [Table 1](#)) and the fact that electronics constitutes one of the product categories with the highest percentage of remanufactured products (e.g. [Abbey et al., 2017](#); [Hazen et al., 2017b](#); [de Vicente Bittar, 2018](#)), a tablet was selected as the experimental product and a fictitious brand name was used to eliminate any brand effects. The common module of our hypothetical

shopping scenario featured an ad illustrating the tablet, its product characteristics and a sale price to control for any potential effects. Our experimental module featured the various manipulations depending on the experimental condition: the return policy (lenient vs. restricted), product type (new vs. remanufactured, where for the latter one, a remanufactured product is defined) and the retail channel type (online vs. store). (Supplementary material for review A provides an overview of the hypothetical shopping scenarios, highlighting the common and experimental module).

### Pilot study

In the post-design stage (Rungtusanatham *et al.*, 2011), we conducted a pilot test to validate our hypothetical shopping scenario. The pilot test consisted of a 2 (product type: new vs. remanufactured)  $\times$  2 (return policy leniency: lenient vs. restricted)  $\times$  2 (retail channel type: online vs. store) between-subjects experiment. Participants were randomly assigned (Bachrach and Bendoly, 2011; Knemeyer and Naylor, 2011) to one of the eight experimental conditions.

A total of fifty participants from the United Kingdom were recruited through the Toluna consumer online panel (Terhanian and Bremer, 2012; Callegaro *et al.*, 2014) to participate in the pilot test. Demographic composition revealed that 52% of the participants were female and the mean age was 45.34 years. The median household income was 30,000–39,999 British pounds (approximately 41,766–55,686 US dollars) and 50% of the participants had at least some college education. We selected participants from the UK since they purchase products at a rate that generates the highest online sales in Europe, increasing the likelihood that participants might have confidence across the two channels we included in the pilot test (Bernon *et al.*, 2016).

Our manipulation check measures asked each participant to evaluate the perceived leniency of the return policy on two bipolar 7-point scales (“not at all lenient”/“very lenient”; “many restrictions”/“few restrictions”). In addition, participants were asked to recall whether the product for which they were shopping was “new” or “remanufactured,” and whether the shopping scenario was “online” or in a brick-and-mortar “store” (Perdue and Summers, 1986; Bachrach and Bendoly, 2011).

A one-way ANOVA, with perceived return policy leniency as the dependent variable and “return policy,” “product type,” and “retail channel type” as independent variables, confirms that participants exposed to a lenient return policy perceived the policy as significantly more lenient ( $M_{\text{Lenient}} = 5.93$ ) than participants exposed to a restricted returns policy ( $M_{\text{Restricted}} = 3.3$ ), with  $F(1,49) = 40.81$ ,  $p < 0.001$ ,  $\eta^2 = 0.493$ . The main effects of “product type” and “channel type” were insignificant, and no significant interaction effects were detected.

Furthermore, we conducted contingency table analyses to evaluate whether participants were aware of their respective experimental groups (Bachrach and Bendoly, 2011; Perdue and Summers, 1986). Our results confirm the validity of the “product type” manipulation (new vs. remanufactured) ( $\chi^2 = 29.10$ ,  $p < 0.001$ , Cramer’s  $V = 0.76$ ) and “retail channel type” manipulation (online vs. store) ( $\chi^2 = 23.27$ ,  $p < 0.001$ , Cramer’s  $V = 0.68$ ) (Miller, 2002).

In addition to our manipulation checks, we also assessed whether participants perceived the shopping scenario as being realistic. We included a two-item, 7-point Likert scale asking participants to evaluate the following statements: “The shopping situation described was realistic” and “I had no difficulty imagining myself in the shopping scenario.” ANOVA results support that all participants perceived the hypothetical shopping scenario as highly realistic ( $M_{\text{lenient\_new\_store}} = 4.57$ ;  $M_{\text{lenient\_new\_online}} = 5.17$ ;  $M_{\text{strict\_new\_store}} = 4.75$ ;  $M_{\text{strict\_new\_online}} = 4.60$ ;  $M_{\text{lenient\_remanufactured\_store}} = 5.75$ ;  $M_{\text{lenient\_remanufactured\_online}} = 5.10$ ;  $M_{\text{strict\_remanufactured\_store}} = 5.00$ ;  $M_{\text{strict\_remanufactured\_online}} = 4.75$ ).

*Main experiment*

*Sample and manipulation check.* For the main experiment, we applied a 2 (product type: new vs. remanufactured)  $\times$  2 (return policy leniency: lenient vs. restricted)  $\times$  2 (retail channel structure: online vs. store) between-subjects design. We recruited a total of 378 participants from the United Kingdom via the Toluna consumer online panel (Terhanian and Bremer, 2012). All participants were randomly assigned to one of eight experimental conditions (Bachrach and Bendoly, 2011) and received \$5 for their participation. Random assignment of participants is an important element of experimental methods as it serves as a statistical control (Harrison *et al.*, 2009) which helps to evenly distribute participants' characteristics over the experimental conditions such that these characteristics do not bias the outcome of the experiment (Kirk, 2012). At the same time, randomization allows us to isolate the causal effects of our independent variables on our dependent variable of interest (Perdue and Summers, 1986; Tokar, 2010). In line with best practices for experimental design (Perdue and Summers, 1986; Bachrach and Bendoly, 2011; Abbey *et al.*, 2017), we integrated our manipulation checks as outlined in our pilot test as well as an attention check [1]. Integrating such checks in the main study helps to validate the effectiveness of the experimental manipulations (Perdue and Summers, 1986; Bachrach and Bendoly, 2011; Abbey *et al.*, 2017) and identifies participants that are inattentive (Abbey *et al.*, 2017). To ensure high data quality, participants that fail the manipulation and attention checks should be removed for the final analysis (Abbey *et al.*, 2017).

In our case, 8 participants failed our attention check, and 68 participants failed our manipulation checks, and hence were removed from the sample, leaving a final sample size of 302 participants. The age range of our final sample was 18–88 years with a mean age of 55.61 years. Approximately 61.3% were female and 38.7% were male. The median household income was £20,000–£29,999 (approximately \$27,844–\$41,764), and 45% of the participants indicated they had at least some college education.

*Measures.* The dependent variables of interest are perceived risk and purchase intention. Perceived risk was measured with a four-item 7-point Likert scale adopted from Laroche *et al.* (2005) and assessed the degree to which an individual perceives a purchase as having negative consequences. Purchase intention from the retailer was measured with a five-item 7-point Likert scale adopted from Bonifield *et al.* (2010) and assessed the likelihood of an individual to purchase a product from a retailer. Table 2 provides an overview of our measures.

*Convergent and discriminant validity assessments.* We estimated a two-factor CFA model, including perceived risk and purchase intention. The CFA fit statistics support our model (Hu and Bentler, 1999), with  $\chi^2 = 62.762$ ,  $df = 26$ , CFI = 0.99, RMSEA = 0.069 (90% confidence interval: 0.047; 0.090), and SRMR = 0.025. The average variance extracted (AVE) for each factor exceeds 0.5, thus supporting convergent validity (Fornell and Larcker, 1981), and all Cronbach's alpha ( $\alpha$ ) values exceed 0.8 (Nunnally and Bernstein, 1994). For the factor pair, the AVEs exceeded the phi-square correlation ( $\phi^2$ ), supporting discriminant validity (Fornell and Larcker, 1981).

Table 2 provides a summary of the standardized loadings and Cronbach's  $\alpha$  values. Following the recommendations of Calantone *et al.* (2017), we used Mplus to retrieve the factor scores for each participant and measure, and then used these scores as observed variables in our analysis. Factor scores have several advantages over simply using averages. Factor scores weigh each individual indicator on the basis of the factor loading, with larger indicators receiving more weight than smaller indicators. Factor scores allow for more information to be extracted than with simple averaging, and hence are advantageous when estimating more complex models with interaction effects (Aiken and West, 1991).

*Control variables.* Prior research has investigated the potential influence of consumer characteristics such as age (e.g. Bhatnagar and Ghose, 2004; Joines *et al.*, 2003;

Item	Adapted from	Standardized loading	AVE	Cronbach's $\alpha$
R1: There is a good chance I will make a mistake if I purchase a new (remanufactured) tablet	Laroche <i>et al.</i> (2005)	0.648	0.673	0.885
R2: I have a feeling purchasing a new (remanufactured) tablet will really cause me lots of trouble		0.867		
R3: I will incur some risk if I buy a new (remanufactured) tablet.		0.836		
R4: A new (remanufactured) tablet is a very risky purchase		0.906		
PI1: I would shop at this retail store (website) again	Bonifield <i>et al.</i> (2010)	0.948	0.884	0.976
PI2: I intend to keep purchasing products from this retail store (website)		0.929		
PI3: I would be happy to choose from the same set of products from this retail store (website) again		0.955		
PI4: I would recommend this retail store (website) to a friend		0.910		
PI5: It is likely that I will at some point in the future shop at this retail store (website) again		0.957		

**Note(s):**  $\chi^2 = 62.762$ ,  $df = 26$ , CFI = 0.98, RMSEA = 0.069 (90% confidence interval: 0.047; 0.090), and SRMR = 0.025

**Table 2.** CFA results

Rohm and Swaminathan, 2004), gender (e.g. Alreck and Settle, 2002; Garbarino and Strahilevitz, 2004) and prior shopping experience (e.g. Mollenkopf *et al.*, 2007; Chen and Dubinsky, 2003). Thus, we include the following control variables in our research: *age* is a continuous variable reflecting the age of the participant. *Return intention* is a continuous variable and captures the consumer's propensity to return a product. Return intention was measured with a three-item, 7-point semantic difference scale (1 = unlikely, 7 = likely; 1 = improbable, 7 = probable; 1 = keep, 7 = return) [2]. *Gender* is a binary categorical variable (0 = male; 1 = female). *Prior return* is also a binary categorical variable capturing whether a consumer has ever returned a product (0 = no prior return; 1 = prior return). *Dummy income* is a binary categorical variable capturing the annual household income of the consumer (0 = median income and below, 1 = above median income). *Dummy education* is a binary categorical variable reflecting the educational status of the consumer (0 = less than some college education, 1 = at least some college education). Table 3 summarizes the descriptive statistics and correlations of our continuous control and main variables of interest and Table 4 provides a summary of the descriptive statistics of the categorical variables.

Continuous variables	Mean	Sd	Perceived risk	Purchase intention	Return intention
Perceived risk (factor scores)	-0.001	0.942	-		
Purchase intention (factor scores)	-0.008	0.976	-0.592***	-	
Return intention (factor scores)	0.005	0.955	0.151***	0.045	-
Age	55.68	16.14	0.016	-0.026	-0.028

**Note(s):** \*\*\*significant at the 0.01 level

**Table 3.** Correlations

**Results**

To test whether perceived risk would mediate the relationship between product type and purchase intention (H1) in general, we ran PROCESS model 4 with 5000 bootstrap samples (Hayes, 2013). We included product type (P) (binary: 0 = new product; 1 = remanufactured product) as our focal predictor, perceived risk as our mediator and purchase intention as our dependent variable. We also included return policy leniency (L) (binary: 0 = strict; 1 = lenient) and retail channel (C) (binary: 0 = store; 1 = online) in addition to our control variables *age*, *gender*, *prior return*, *return intention*, *dummy income* and *dummy education*.

Table 5 summarizes the results of PROCESS model 4. Results indicate no significant effect of age, income and education on perceived risk, but do show a significant effect with regard to the following three control variables: gender ( $\beta_{\text{Gender}} = 0.314, p < 0.01$ ), indicating that female consumers perceive higher risk than male consumers; prior return behavior ( $\beta_{\text{PriorReturn}} = -0.258, p < 0.05$ ), indicating that consumers who have returned a product before perceive lower risk than consumers who have not returned a product; and overall return intention ( $\beta_{\text{Return}} = 0.170, p < 0.01$ ), indicating that consumers who have a generally higher intention to return a product have higher risk perceptions.

We observe a significant direct effect of product type on perceived risk ( $\beta_{\text{Product}} = 0.634, p < 0.01$ ) (see Table 5), illustrating that consumers have significantly higher risk perceptions of a remanufactured product than of a new product, all else held equal. In addition, in support of H1, the results show a significant indirect effect of product type on purchase intention

**Table 4.**  
Descriptive statistics  
for categorical  
variables

Variable	Categories	Percentage
Gender	Male	38.7%
	Female	61.3%
Prior return	No prior return	30.1%
	Prior return	69.9%
Dummy income	≤ £29,999	50.3%
	≥ £29,999	49.7%
Dummy education	Less than some college education	45.0%
	At least some college education	55.0%

**Table 5.**  
Process model 4

DV	Model 1 Perceived risk	Model 2 Purchase intention
Intercept	-0.296 (0.241)	-0.601*** (0.192)
Leniency (L)	-0.709*** (0.094)	0.897*** (0.082)
Product (P)	0.634*** (0.095)	-0.013 (0.081)
Channel (C)	-0.065 (0.093)	-0.142* (0.074)
Age	0.005* (0.003)	0.002 (0.003)
Gender	0.314*** (0.102)	0.268*** (0.083)
Prior return	-0.258*** (0.104)	-0.077 (0.084)
Return intention	0.170*** (0.050)	0.057 (0.041)
Dummy income	0.170* (0.097)	0.078 (0.077)
Dummy education	-0.109 (0.097)	-0.140* (0.077)
Perceived risk		-0.467*** (0.047)
F-value (df)	13.76 (9.292)***	41.06 (10.291)***
R <sup>2</sup>	0.30	0.59
Indirect effect	-0.296	CI [-0.399; -0.198]

**Note(s):**  $p < 0.01$ \*\*\*;  $p < 0.05$ \*\*;  $p < 0.1$ \*; standard errors for the coefficients are reported in parentheses

(effect size =  $-0.296$ , CI [ $-0.399$ ;  $-0.198$ ]) (see Table 5), suggesting that perceived risk mediates the relationship between product type on purchase intention from a retailer, such that consumers have lower purchase intentions from a retailer for remanufactured products than for new products due to higher perceived risk.

To test H2 and H3, we ran PROCESS model 10 with 5000 bootstrap samples (Hayes, 2013), with product type as our focal predictor, return policy leniency and retail channel as our two moderators, perceived risk as our mediator and purchase intention from the retailer as our dependent variable. We again controlled for *age*, *gender*, *prior return*, *return intention*, *dummy income* and *dummy education*. Table 6 summarizes the results of PROCESS model 10.

The interaction between product type and return policy leniency is positive and significant ( $\beta_{P \times L} = 0.401, p < 0.05$ ) (see Table 6), but the interaction between product type and retail channel is not significant ( $\beta_{P \times C} = -0.159, p = \text{n.s.}$ ) (see Table 6). The indices of partial moderation mediation support that there is a significant positive indirect effect of a lenient return policy and that the effect is greater for new products than for remanufactured products (index =  $-0.184$ , CI [ $-0.368$ ;  $-0.013$ ]) (see Table 6). However, the indices of partial moderation mediation do not support that there is a significant indirect effect of the retail channel and that the effect is the same for new products and for remanufactured products (index =  $0.073$ , CI [ $-0.089$ ;  $0.248$ ]).

Conditional indirect effects show that, all else equal, consumers have higher intentions to purchase a remanufactured product from a retailer with a lenient return policy than from a retailer with a strict return policy owing to lower perceived risk (effect<sub>brick-and-mortar</sub> =  $0.274$ , CI [ $0.116$ ;  $0.438$ ] and effect<sub>online</sub> =  $0.197$ , CI [ $0.051$ ;  $0.352$ ]) (see Table 7). Thus, H2 is supported. In addition, a similar pattern is observed for a new product. Overall, the positive effect of a lenient return policy is greater for new products than for remanufactured products (index =  $-0.184$ , CI [ $-0.372$ ;  $-0.007$ ]) (see Table 7).

Conditional indirect effects reflect no significant difference between the brick-and-mortar and online channels in purchasing a remanufactured product, all else held equal (effect<sub>lenient</sub> =  $0.027$ ; CI [ $-0.115$ ;  $0.174$ ] and effect<sub>strict</sub> =  $0.102$ , CI [ $-0.046$ ;  $0.256$ ]) (see

DV	Model 1 Perceived risk	Model 2 Purchase intention
Intercept	-0.226 (0.249)	-0.595*** (0.199)
Leniency (L)	-0.912*** (0.134)	0.982*** (0.115)
Product (P)	0.502*** (0.165)	-0.012 (0.134)
Channel (C)	0.007 (0.132)	-0.235** (0.106)
P × L	0.401** (0.187)	-0.163 (0.151)
P × C	-0.159 (0.186)	0.191 (0.149)
Age	0.006* (0.003)	0.02 (0.003)
Gender	0.299*** (0.102)	0.271*** (0.083)
Prior return	-0.268** (0.104)	-0.062 (0.085)
Return intention	0.178*** (0.050)	0.055 (0.041)
Dummy income	0.163* (0.096)	0.080 (0.077)
Dummy education	-0.020 (0.097)	-0.145* (0.077)
Perceived risk		0.458*** (0.047)
F-value (df)	11.87 (11.290)***	34.54 (12.289)***
R <sup>2</sup>	0.31	0.59

*Indices of moderated mediation*

Leniency	-0.184	CI [ $-0.358$ ; $-0.0123$ ]
Store	0.073	CI [ $-0.089$ ; $0.248$ ]

**Note(s):**  $p < 0.01$ \*\*\*;  $p < 0.05$ \*\*;  $p < 0.1$ \*; standard errors for the coefficients are reported in parentheses

**Table 6.** Process model 10

Conditional indirect effect of leniency			
	Product	Retail channel	CI
0.274	Remanufactured	Brick-and-mortar	[0.116; 0.438]*
0.197	Remanufactured	Online	[0.051; 0.352]*
0.457	New	Brick-and-mortar	[0.289; 0.641]*
0.380	New	Online	[0.214; 0.569]*
Index <sup>+</sup>	-0.183 CI [-0.372; -0.007] *		-0.077 CI [-0.246; 0.095]

Conditional indirect effect of retail channel			
	Product	Leniency	CI
0.106	Remanufactured	Strict	[-0.046; 0.256]
0.027	Remanufactured	Lenient	[-0.115; 0.174]
0.036	New	Strict	[-0.137; 0.198]
-0.043	New	Lenient	[-0.177; 0.085]
Index <sup>+</sup>	0.070 CI [-0.096; 0.251]		-0.078 CI [-0.247; 0.089]

**Note(s):** \*indicates significance since 0 is not included in the confidence interval. + the index of moderated mediation indicates whether the effect sizes in the two groups are the same holding the other factor constant

**Table 7.**  
Conditional indirect effects

Table 7). Thus, H3 is not supported. This same pattern can be observed for new products, with no significant difference for this effect whether the product is remanufactured or new (index = 0.070, CI [-0.247; 0.251] (see Table 7), indicating that, all else held equal, consumers have a similar purchase intention for a new and remanufactured product in a brick-and-mortar and online setting. Table 7 summarizes the conditional indirect effects.

### Discussion

In line with our theoretical predictions, our results illustrate that perceived risk mediates the relationship between product type and purchase intention. We establish that consumers have higher risk perceptions for a remanufactured product than a new product which leads to lower purchase intention. Therefore, consumer risk perception constitutes an important barrier for manufacturers and retailers to overcome.

This study specifically focused on investigating the efficacy of two factors to reduce the perceived risk of remanufactured products: return policy leniency and the retail channel structure. First, while prior literature has established that consumers value return policy leniency (to reduce risk perceptions) for new products, our empirical findings generated by an experimental design suggest that this preference also holds in the contextual setting of remanufactured products. Thus, a lenient return policy can serve as a valuable tool for retailers to support the introduction of remanufactured products into the consumer market and accordingly increase purchase intention.

Second, our findings reveal an important point with regard to the decision of the distribution channel itself. Interestingly, we find that providing a lenient return policy for remanufactured products positively influences consumer purchase intention in both the brick-and-mortar and online channels. Contrary to our predictions, consumers perceived remanufactured products sold via the brick-and-mortar store and online as equally risky. Our findings provide evidence against the conventional wisdom which opines that the ability to “touch and feel” (i.e. to inspect a product) in a brick-and-mortar store provides more comfort than the purchase of a product in an online context. Thus, it appears that both channel settings are appropriate options for retailers to sell remanufactured products to consumers

and that feasible risk reduction factors should be employed in both channels (notably, this finding also applies to new products). This rather counterintuitive result regarding the equivalency of both channel options can likely be explained by looking at the acceptance of online retailing over time. As such, consumer purchase behavior online has evolved to a “normal” shopping behavior with correspondingly decreased risk, and in 2019, 60% of people in the EU aged 16–74 shopped online during the year. Compared with 2009, the share of online shoppers had almost doubled from 32% and that number is expected to further grow (Eurostat, 2020).

In addition, retailers have recently – also due to the pandemic situation – innovated their online presence bringing an in-store feel to the digital experience (McKinsey, 2020). This has been done via several activities, from substituting in-store personalized interaction with offerings such as virtual appointments, to use videoconferencing platforms to offer personalized attention to customers. Similarly, retailers are using livestreaming to engage with customers and increase revenue and loyalty by sharing experiential content. Such tools and activities, combined with new technologies such as augmented-reality (AR), machine-learning and computer-vision techniques such as virtual try-on technology (Zhang *et al.*, 2019), help retailers to “tangibilize” the online experience and thereby achieve alternative business models that lead consumers to perceived de-risk digital purchasing decisions.

#### *Theoretical implications*

First, as Janakiraman *et al.* (2016) observe, prior research utilizing signaling theory, consumer risk theory and construal-level theory all postulate that lenient return policies should positively affect product purchase (albeit with differing effects depending upon the chosen return policy factors being considered). Abbey *et al.* (2017) also reveal the higher consumer perceived risk (i.e. uncertainty) associated with remanufactured product versus new product. Thus, given our study focus, we chose to utilize TPR (Taylor, 1974) as our theoretical base. By utilizing the lens of the TPR (Taylor, 1974), we demonstrated that lenient return policy can reduce the uncertainty regarding the outcome and the consequences of consumer risk perceptions. TPR particularly provides this clarity *vis-à-vis* other theories because of its focus on information handling (i.e. *how* consumers evaluate information). This is, perhaps, TPR’s most valuable contribution to theory development in remanufactured product research.

Additionally, our exploration of the role of distribution channel structure to reduce such perceived consumer risk is based, again, upon the TPR’s (Taylor, 1974) conceptualization of information handling (particularly information acquisition and information transmission) which is accentuated by limits of consumer time and effort (Mitchell and McGoldrick, 1996). We also drew on the recent literature’s (Rao *et al.*, 2018; Nepomuceno *et al.*, 2014; Griffis *et al.*, 2012) notion of the brick-and-mortar channel’s advantage (*vis-à-vis* the online channel) regarding “touch and feel.” Thus, we hypothesized a difference between the two channel structures; however, the evidence from the experiment shows the two channels made no difference to the effects of product type with regard to the reduction of perceived consumer risk. Based on that, it can be assumed our experiment does not really capture the effect of information handling; rather it is probable it strived to catch the effects information processing has in the two channels which do not differ in reducing the perceived risk for remanufactured products and consequently in increasing the purchase intention.

Based on that, future research should better explore whether there are information processing differences in the two channels that help in reducing such risk and if there are other factors beyond the channel type that can reduce risk perception. Such advancement is a task for future research, and other theories are required to explore such phenomenon.

Second, while prior literature has assumed that remanufactured products are likely associated with higher risk perceptions than new products, this relationship with outcome

and consequence uncertainty has not formally been established yet (Abbey *et al.*, 2015). We provide initial empirical evidence that perceived risk indeed *differs* for remanufactured and new products. This is especially important considering “though multiple works related to perceptions of new products provide initial guidance on the topics of quality perceptions, brand effects, and behavioural outcomes (e.g. Rao and Monroe, 1989; Sweeney *et al.*, 1999; Yoo *et al.*, 2000; Zeithaml, 1988), remanufactured products appear to generate perceptions and behaviours that do not fit with the norms of the new product literature, such as the lower quality perception previously discussed (Abbey *et al.*, 2017, p. 101).” Hence, despite existing research on perceived risk for new products, our research context is different, and we argue that a remanufactured product can be perceived differently in terms of two aspects of risk (i.e. outcome and consequence uncertainty). Thus, return policy leniency could be primarily concerned with outcome uncertainty (e.g. what if the remanufactured product is of poor quality?) and related consequence uncertainty of making a poor decision to purchase the remanufactured product. This aspect stresses the relevance of information handling. Indeed, while initial research found support for significant differing quality perceptions between new and remanufactured products (Abbey *et al.*, 2015b), recent research was not able to confirm that difference (Duan and Aloysius, 2019). Thus, our research based upon TPR adds to the growing body of knowledge in this topic area.

Third, we explored the boundary conditions of return policy leniency and distribution channel structure for TPR in the context of remanufactured and new products. In line with Whetten (2009), this approach constitutes a significant contribution by *contextualizing theory*. In particular, we draw upon prior research results regarding new products, return policy leniency and distribution channel structure to generate novel insights that suggest how the theory might be applied in the remanufactured product context. More specifically, regarding return policy leniency, we extend TPR by showing that consumers use return policy leniency as a “cue” for mitigating their uncertainty about outcome and consequences perceptions pertaining to purchase intention in the context of remanufactured and new products. Regarding the channel of distribution, our results (in H3) indicate that although prior research has suggested that for new products the online channel is riskier than the brick-and-mortar channel (Nepomuceno *et al.*, 2014; Griffis *et al.*, 2012), this condition does not hold true for remanufactured products.

Fourth, by relying on the TPR in our research, we extend the use and relevance of consumer-based decision theories to this emerging area of interest to scholars from multiple disciplines. Specifically, we develop middle-range theory (Craighead *et al.*, 2016; Stank *et al.*, 2017; Russo *et al.*, 2020) that explains why consumers have higher risk perceptions of remanufactured products than new products, as well as how those perceptions affect purchase intention. Given that remanufactured products have so far only been suggested to be of higher risk (Abbey *et al.*, 2017) and consumers are more reluctant to purchase riskier products (Wang and Hazen, 2016), this finding provides an important extension to the TPR (Taylor, 1974).

Lastly, our study empirically investigates the role of return policy leniency under a controlled experimental research setting, answering the call for such analysis from previous research (Janakiraman *et al.*, 2016). Importantly, the scenarios created for our research considered all five dimensions of return policy leniency (Janakiraman *et al.*, 2016), whereas most previous research has examined the effects of these dimensions in isolation (Rao *et al.*, 2018). Thus, we present a more thorough, holistic and nuanced perspective of return policy leniency.

#### *Managerial implications*

Our findings also provide several implications for managers. Supply chain managers should be aware that the consumer–retailer interface is essential to the successful introduction and

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sales of remanufactured products. These same managers should be aware that consumer risk perceptions constitute a significant barrier for such products and that both managers and/or their firm must develop a clear understanding of how to mitigate this barrier in order to succeed with their chosen strategy regarding remanufactured products. Our research suggests that providing a lenient return policy for remanufactured products may encourage consumers to purchase remanufactured products from retailers, and hence constitutes a functional tool for success. However, since lenient return policies are known to not only increase sales but also potentially increase returns (Petersen and Kumar, 2015), managers must carefully understand the impact of returns policy leniency against the possibility of having to process more returns of remanufactured products. Typically, an increasingly liberal return policy results in more returns, more processing and thus potentially more costs incurred (Mollenkopf *et al.*, 2011). A potential solution to this conundrum could be to customize the return policy, depending on whether the product is new or remanufactured. For example, a more lenient return policy for remanufactured products might allow consumers to experience the product for a longer period of time, hopefully developing positive associations with the remanufactured product. Such associations could lead to repeat purchase of other remanufactured products in the long term.

Furthermore, our research suggests that the perceived risk associated with purchasing a remanufactured product does not differ across channels of distribution. Thus, either channel (i.e. brick-and-mortar or online) or even a combination of both appears to be appropriate to distribute remanufactured products. However, managers should also be aware of the different nature of these two shopping environments since consumers still perceive a higher risk for remanufactured than new products. Managers might wish to employ additional strategies suitable for each shopping environment to manage consumer risk perceptions of remanufactured products. For example, brick-and-mortar stores allow the consumers to inspect (i.e. touch and feel) the product before making the purchase and also allow consumers to have the opportunity to interact with and gather more information about the remanufactured product from a sales associate. While face-to-face consumer–salesperson interaction will likely require additional sales personnel training, it also may increase sales, offer branding opportunities and reduce returns and related negative word-of-mouth for both the product itself and the retailer. In the online channel, these aforementioned options to manage consumer perceived risk are missing. Considering that the majority of consumers would rather purchase a remanufactured product online than in a brick-and-mortar store (Rallo, 2019), it becomes evident that additional strategies (i.e. a lenient return policy that allows for inspection at home) can be a valuable option when distributing remanufactured products via an online channel. In the online channel, in addition to offering a lenient return policy, retailers could provide consumers with detailed information about the remanufacturing process as well as certificates of quality to reassure consumers of the quality of the remanufactured products.

Considerable evidence illustrates that out of competitive necessity, manufacturers are reexamining their distribution strategies so as to serve consumers equally well through multiple channels (Zinn and Goldsby, 2017). While some manufacturers are adopting (or maintaining) more traditional strategies to discourage consumers from shopping across channels, others are investing resources to serve consumers through different yet complementary channels (Murfield *et al.*, 2017; Gundlach *et al.*, 2019). Within this context and given our findings that consumers have similar risk perceptions for purchasing a remanufactured product online or in a brick-and-mortar store, retailers should proactively evaluate their current distribution channel structure(s) and related distribution strategy in order to provide consumers with a supportive cross-channel “shopping experience” as it relates to product search and related purchase intention. Such evaluation could increase the exposure to and the level of remanufactured product sales. Of course, such an evaluation

would require retailers' channel strategies to maintain appropriate levels of product inventory (new vs. remanufactured) and its placement throughout the supply chain (from warehouse to distribution center to retail location), as well as commensurate reduced costs of non-productive transportation. Clearly, such considerations require a careful cost-benefit analysis.

#### *Limitations and future research*

This research should be interpreted in light of its limitations. First, a researcher's choice to select a particular theory as opposed to other theories is likely a limitation (and an opportunity for future research) in and of itself. Our decision to utilize [Taylor's \(1974\)](#) TPR (i.e. consumer risk theory) to investigate remanufactured product acceptance assumes that uncertainty on the consumer's part is experienced as risk, and that uncertainty takes the form of outcome uncertainty and consequence uncertainty; the primary method to reduce such uncertainty is information handling. Would future research utilizing another theory (also one outside those typically utilized in SCM and logistics) better advance research wherein a consumer-centric perspective is called for? For example, procedural justice theory refers to the fairness of policies and processes employed in pursuit of organizational outcomes ([Lind and Tyler, 1988](#)); it has been used extensively to understand how consumers respond to service recovery events such as the returns process ([Griffis et al., 2012](#)). By definition, procedural justice theory is concerned with outcomes, likely somewhat less so with regard to consequences. Signaling theory ([Wood, 2001](#); [Connelly et al., 2011](#); [Walsh et al., 2016](#)) hypothesizes that a linkage exists between "signals" (similar to TPR's "cues") such as organizational reputation and product quality and purchase intention, or between lenient return policy and product quality. Signaling theory appears to be concerned more with outcomes rather than consequences. Prospect theory ([Kahneman and Tversky, 1979](#)) accounts for contextual effects and frames event alternatives in terms of gain versus loss and the according risk aversion levels of each situation; it seemingly takes into account both outcomes and consequences. Other psychology-/cognitive-based theories could also be utilized or develop new middle-range theories ([Hazen et al., 2020](#); [Russo et al., 2020](#)).

Second, from TPR's perspective, return policy leniency may allow the consumer to drastically reduce outcome uncertainty; there is little to no penalty applied to a poor decision and its accompanying dissatisfaction, and thus consequence uncertainty is also reduced. In regard to distribution channel structure, the consumer must expend effort shopping at the brick-and-mortar store to "touch and feel"; such effort reduces outcome uncertainty in particular, as well as reduces consequence uncertainty via information handling. The perceived risk shopping in the online context appears to be close to, if not the same, as consumer comfort with the online format, and technology advancements bring this format closer and closer to brick-and-mortar. A very interesting question for future research would be as follows: Are the uncertainties being reduced by return policy leniency and distribution channel structure equivalent, or not? How should such uncertainties be measured, and what are the costs (and benefits, financial and otherwise) associated with reducing each form of uncertainty? TPR does not provide answers to these questions – and thus one of the theories suggested above (or some other theory) might be helpful in providing an answer?

Third, as we adopted a controlled experimental research setting, we concurrently isolated the effects of the manipulated variables on our dependent variable of interest ([Perdue and Summers, 1986](#); [Tokar, 2010](#)). While that research approach increased the internal validity of our findings, it limits the external validity. In addition, there might be other variables (i.e. individual characteristics such as the propensity to make an online purchase) that could influence a consumers' intention to purchase a remanufactured product. Hence, future

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research might employ different methods, for instance, a field study with a retailer that sells remanufactured products or a consumer survey to overcome this limitation.

Fourth, given that return policy plays an important role in the context of remanufactured products and in the execution of a successful omni-channel strategy, future research should attempt to investigate how to better calibrate other factors to reduce the perceived risk in order to improve the likelihood of a successful strategy across different channels. For example, following the stream of consumer-based SCM literature (Esper and Peinkofer, 2017), further research could focus on specific consumer segments that already purchased remanufactured products versus those who have never purchased such products. In addition, due to the consumer context of this study that is linked to the discipline of marketing, future research could involve collaboration across disciplines in order to generate a richer understanding of consumers' perceived value of remanufactured products as well as differing motivations across consumer segments related to remanufactured products.

Fifth, our research design focused on consumer perceptions and purchase intention, and how retailers might adjust strategy with regard to return policy and distribution channel structure to better satisfy the consumer. Clearly, such emphasis on the downstream portion of the supply chain does not take into account the manufacturer who designs and produces remanufactured products (and the considerable risk involved in such activity) as well as being instrumental in the creation of product return and distribution policy. Thus, future research could explore the role of said manufacturers in regard to the satisfaction of the consumer and/or the retailer and thus provide a more thorough examination of remanufactured product and its role in a supply chain.

Sixth, our findings reveal an important point with regard to the decision regarding the distribution channel itself. Interestingly, we find that providing a lenient return policy for remanufactured products positively influences consumer purchase intention in both the brick-and-mortar and online channels. Contrary to our predictions, consumers perceived remanufactured products sold via the brick-and-mortar store and online as equally risky. Certainly, this counterintuitive result and its associated conditions requires additional verification by other researchers to verify its veracity and implications from a theoretical perspective. Moreover our study does not directly measure information handling as theorized in TPR, so the implication for future research should verify information processing differences across the two channels in terms of how the different channels affect risk perception and purchase intentions, and if so, whether other factors beyond the channels and other theories should be identified.

Based on that, it would be interesting to explore the longitudinal effect of consumers' intention to purchase a remanufactured product across and between the brick-and-mortar and online channels. Such an approach would allow researchers to gain further insights into whether a consumer's prior experience with the brick-and-mortar and online channel would impact their perceptions and behavioral intentions to switch toward the online channel. In other words, has the online channel existed for a sufficient length of time now so that it has "blurred" the line in the consumer's mind between it and the traditional brick-and-mortar channel? Very limited research exists in this subject area (see Laroche *et al.*, 2005), and it is now fifteen years old. Interestingly, in light of our current research, an investigation into such switching behavior considers only one-half of the potential consumer switching behavior in question: we would also be interested in the nature of consumer switching behavior with regard to product type (i.e. new product and remanufactured product). In sum, our investigation is one of very few studies that examine the contextual conditions of such consumer behavior – and future research is certainly warranted.

Lastly, as briefly noted at the beginning of this paper, companies are feeling increased pressure from consumers to adopt policies that recognize the importance and value of sustainable business activity (Hickey, 2020). Such activity is particularly relevant in the

discussion of initiatives such as “closed-loop supply chain” practice and especially so in the larger scope of what is known as the “circular economy (CE).” Our findings hold some promise for the successful integration of remanufactured products into these initiatives and how the transition from linear to CE begins with an increased focus on the end-consumer as a critically important supply chain partner to develop a successful CE initiative (Hazen *et al.*, 2020). However, much work remains to be undertaken in specifically linking our results to these larger initiatives. The existence of remanufactured products in such policy and related strategy is clear; what is much less clear is specifically how such products can fulfill their role given consumers’ perspectives on risk, challenges in a rapidly evolving multichannel environment and (as noted above) taking into account the manufacturer and retailer perspectives on risk (from their location in the supply chain).

### Notes

1. The attention check used in this experiment was the following: “In order to ensure that data is being collected correctly please answer the following question: Have you had breakfast with a dinosaur today?” and provided participants with the answer option *yes* and *no*. The attention check measure was placed at the very end of the data collection instrument to ensure that participants would pay attention throughout the complete experimental experience.
2. In line with our process for our main variables of interest and best practices Calantone *et al.* (2017), we also extracted the factor score for return intention.

### References

- Abbey, J.D., Blackburn, J.D. and Guide, V.D.R. (2015a), “Optimal pricing for new and remanufactured products”, *Journal of Operations Management*, Vol. 36, pp. 130-146.
- Abbey, J.D., Meloy, M.G., Guide, V.D.R. Jr and Atalay, S. (2015b), “Remanufactured products in closed-loop supply chains for consumer goods”, *Production and Operations Management*, Vol. 24 No. 3, pp. 488-503.
- Abbey, J.D., Kleber, R., Souza, G.C. and Voigt, G. (2017), “The role of perceived quality risk in pricing remanufactured products”, *Production and Operations Management*, Vol. 26 No. 1, pp. 100-115.
- Aiken, L.S. and West, S.G. (1991), *Multiple Regression: Testing and Interpreting Interactions*, Sage, Thousand Oaks, California, CA.
- Alreck, P. and Settle, R.B. (2002), “Gender effects on internet, catalogue and store shopping”, *Journal of Database Marketing and Customer Strategy Management*, Vol. 9 No. 2, pp. 150-62.
- Bachrach, D.G. and Bendoly, E. (2011), “Rigor in behavioral experiments: a basic primer for supply chain management researchers”, *Journal of Supply Chain Management*, Vol. 47 No. 3, pp. 5-8.
- Bauer, R.A. (1960), “Consumer behaviour as risk taking, in dynamic marketing for a changing world”, *Proceedings of the 43rd National Conference of the American Marketing Association in Chicago, USA, 1960*, American Marketing Association, Chicago, IL, pp. 389-398.
- Bechwati, N.N. and Siegal, W.S. (2005), “The impact of the prechoice process on product returns”, *Journal of Marketing Research*, Vol. 42 No. 3, pp. 358-367.
- Bernon, M., Cullen, J. and Gorst, J. (2016), “Online retail returns management: integration within anomni-channel distribution context”, *International Journal of Physical Distribution and Logistics Management*, Vol. 46 Nos 6/7, pp. 584-60.
- Bhatnagar, A. and Ghose, S. (2004), “Segmenting consumers based on the benefits and risks of internet shopping”, *Journal of Business Research*, Vol. 57 No. 12, pp. 1352-1360.
- Bonifield, C., Cole, C. and Schultz, R.L. (2010), “Product returns on the internet: a case of mixed signals?”, *Journal of Business Research*, Vol. 63 No. 9, pp. 1058-1065.

- Calantone, R., Whipple, J.M., Wang, J.F., Sardashti, H. and Miller, J.W. (2017), "A primer on moderated mediation analysis: exploring logistics involvement in new product development", *Journal of Business Logistics*, Vol. 38 No. 3, pp. 151-169.
- Callegaro, M., Baker, R.P., Bethlehem, J., Göritz, A.S., Krosnick, J.A. and Lavrakas, P.J. (Eds) (2014), *Online Panel Research: A Data Quality Perspective*, John Wiley & Sons.
- Chen, Z. and Dubinsky, A.J. (2003), "A conceptual model of perceived customer value in e-commerce: a preliminary investigation", *Psychology and Marketing*, Vol. 20 No. 4, pp. 323-347.
- Connelly, B.L., Certo, S.T., Ireland, R.D. and Reutzel, C.R. (2011), "Signaling theory: a review and assessment", *Journal of Management*, Vol. 37, pp. 39-67.
- Constantinides, E. (2004), "Influencing the online consumer's behavior: the web experience", *Internet Research*, Vol. 14 No. 2, pp. 111-126.
- Craighead, C.W., Ketchen, D.J. Jr and Cheng, L. (2016), "Goldilocks theorizing in supply chain research: balancing scientific and practical utility via middle-range theory", *Transportation Journal*, Vol. 55 No. 3, pp. 241-257.
- De Vicente Bittar, A. (2018), "Selling remanufactured products: does consumer environmental consciousness matter?", *Journal of Cleaner Production*, Vol. 181, pp. 527-536.
- Duan, Y. and Aloysius, J.A. (2019), "Supply chain transparency and willingness-to-pay for refurbished products", *The International Journal of Logistics Management*, Vol. 30 No. 3, pp. 797-820.
- Esper, T.L. and Peinkofer, S.T. (2017), "Consumer-based supply chain management performance research: a structured literature review", *Transportation Journal*, Vol. 56 No. 4, pp. 395-428.
- Esper, T.L., Jensen, T.D., Turnipseed, F.L. and Burton, S. (2003), "The last mile: an examination of effects of online retail delivery strategies on consumers", *Journal of Business Logistics*, Vol. 24 No. 2, pp. 177-203.
- Eurostat (2020), "Online shopping continues to grow", available at: <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20200420-2>.
- Foerstl, K., Azadegan, A., Leppelt, T. and Hartmann, E. (2015), "Drivers of supplier sustainability: moving beyond compliance to commitment", *Journal of Supply Chain Management*, Vol. 51 No. 1, pp. 67-92.
- Foscht, T., Ernstreiter, K., Maloles, C. III, Sinha, I. and Swoboda, B. (2013), "Retaining or returning? Some insights for a better understanding of return behaviour", *International Journal of Retail and Distribution Management*, Vol. 41 No. 2, pp. 113-134.
- Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50.
- Garbarino, E. and Strahilevitz, M. (2004), "Gender differences in the perceived risk of buying online and the effects of receiving a site recommendation", *Journal of Business Research*, Vol. 57 No. 7, pp. 768-775.
- Gaur, J., Mani, V., Banerjee, P., Amini, M. and Gupta, R. (2018), "Towards building circular economy: a cross-cultural study of consumers' purchase intentions for reconstructed products", *Management Decision*, Vol. 57 No. 4, pp. 886-903.
- Geissdoerfer, M., Savaget, P., Bocken, N.M. and Hultink, E.J. (2017), "The circular economy—A new sustainability paradigm?", *Journal of Cleaner Production*, Vol. 143, pp. 757-768.
- Govindan, K., Jiménez-Parra, B., Rubio, S. and Vicente-Molina, M.A. (2019), "Marketing issues for remanufactured products", *Journal of Cleaner Production*, Vol. 227, pp. 890-899.
- Griffis, S.E., Rao, S., Goldsby, T.J. and Niranjana, T.T. (2012), "The customer consequences of returns in online retailing: an empirical analysis", *Journal of Operations Management*, Vol. 30 No. 4, pp. 282-294.
- Guide, V.D.R. Jr and Li, J. (2010), "The potential for cannibalization of new products sales by remanufactured products", *Decision Sciences*, Vol. 41 No. 3, pp. 547-572.

- Guide, V.D.R. Jr and Van Wassenhove, L.N. (2009), "OR forum—the evolution of closed-loop supply chain research", *Operations Research*, Vol. 57 No. 1, pp. 10-18.
- Gundlach, G., Frankel, R. and Krotz, R. (2019), "Competition policy and antitrust law: implications of developments in supply chain management", *Journal of Supply Chain Management*, Vol. 55 No. 2, pp. 47-67.
- Harrison, G.W., Lau, M.I. and Rutström, E.E. (2009), "Risk attitudes, randomization to treatment, and self-selection into experiments", *Journal of Economic Behavior and Organization*, Vol. 70 No. 3, pp. 498-507.
- Hayes, A.F. (2013), *Introduction to Mediation, Moderation, and Conditional Process Analysis. A Regression Based Approach*, The Guilford Press, New York, NY.
- Hazen, B.T., Overstreet, R.E., Jones-Farmer, L.A. and Field, H.S. (2012), "The role of ambiguity tolerance in consumer perception of remanufactured products", *International Journal of Production Economics*, Vol. 135 No. 2, pp. 781-790.
- Hazen, B.T., Boone, C.A., Wang, Y. and Khor, K.S. (2017a), "Perceived quality of remanufactured products: construct and measure development", *Journal of Cleaner Production*, Vol. 142, pp. 716-726.
- Hazen, B.T., Mollenkopf, D.A. and Wang, Y. (2017b), "Remanufacturing for the circular economy: an examination of consumer switching behavior", *Business Strategy and the Environment*, Vol. 26 No. 4, pp. 451-464.
- Hazen, B.T., Russo, I., Confente, I. and Pellathy, D. (2020), "Supply chain management for circular economy: conceptual framework and research agenda", *International Journal of Logistics Management*, Vol. ahead-of-print No. ahead-of-print, doi: [10.1108/IJLM-12-2019-0332](https://doi.org/10.1108/IJLM-12-2019-0332).
- Herhausen, D., Binder, J., Schogel, M. and Herrmann, A. (2015), "Integrating bricks with clicks: reatiler-level and channel-level outcomes of online-offline channel integration", *Journal of Retailing*, Vol. 91 No. 2, pp. 309-325.
- Hickey, S. (2020), "Secondhand no longer second-best for UK's 'circular economy' consumers", available at: <https://www.theguardian.com/money/2020/nov/22/from-baby-clothes-to-ikea-furniture-were-shopping-secondhand-to-save-the-planet>.
- Hjort, K. and Lantz, B. (2016), "The impact of returns policies on profitability: a fashion e-commerce case", *Journal of Business Research*, Vol. 69 No. 11, pp. 4980-4985.
- Hsiao, L. and Chen, Y.J. (2012), "Returns policy and quality risk in E-business", *Production and Operations Management*, Vol. 21 No. 3, pp. 489-503.
- Hu, L. and Bentler, P.M. (1998), "Fit indices in covariance structure modeling: sensitivity to underparameterized model misspecification", *Psychological Methods*, Vol. 3, pp. 424-453.
- Huppertz, J.W. (2007), "Firms' complaint handling policies and consumer complaint voicing", *Journal of Consumer Marketing*, Vol. 24 No. 7, pp. 428-437.
- Ishfaq, R., Defee, C.C., Gibson, B.J. and Raja, U. (2016), "Realignment of the physical distribution process in Omni-Channel fulfillment", *International Journal of Physical Distribution and Logistics Management*, Vol. 46 Nos 6/7, pp. 543-561.
- Janakiraman, N., Syrdal, H.A. and Freling, R. (2016), "The effect of return policy leniency on consumer purchase and return decisions: a meta-analytic review", *Journal of Retailing*, Vol. 92 No. 2, pp. 226-235.
- Jiménez-Parra, B., Rubio, S. and Vicente-Molina, M.A. (2014), "Key drivers in the behavior of potential consumers of remanufactured products: a study on laptops in Spain", *Journal of Cleaner Production*, Vol. 85, pp. 488-496.
- Joines, J.L., Scherer, C.W. and Scheufele, D.A. (2003), "Exploring motivations for consumer Web use and their implications for e-commerce", *Journal of Consumer Marketing*, Vol. 20 No. 2, pp. 990-108.
- Kahneman, D. and Tversky, A. (1979), "Prospect theory: an analysis of decision under risk", *Econometrica*, Vol. 47 No. 2, pp. 263-291.

- Kaplan, L.B., Szybillo, G.J. and Jacoby, J. (1974), "Components of perceived risk in product purchase: a cross-validation", *Journal of Applied Psychology*, Vol. 59 No. 3, p. 287.
- Khor, K.S. and Hazen, B.T. (2017), "Remanufactured products purchase intentions and behaviour: evidence from Malaysia", *International Journal of Production Research*, Vol. 55 No. 8, pp. 2149-2162.
- Kirk, R.E. (2012), "Experimental design", *Handbook of Psychology*, 2nd ed., p. 2.
- Knemeyer, A.M. and Naylor, R.W. (2011), "Using behavioral experiments to expand our horizons and deepen our understanding of logistics and supply chain decision making", *Journal of Business Logistics*, Vol. 32 No. 4, pp. 296-302.
- Laroche, M., Yang, Q., McDougall, G.H.G. and Bergeron, J. (2005), "Internet versus bricks-and-mortar retailers: an investigation into intangibility and its consequences", *Journal of Retailing*, Vol. 81 No. 4, pp. 251-267.
- Lind, A.E. and Tyler, T.R. (1988), *The Social Psychology of Procedural Justice*, Plenum Press, New York, NY.
- Liu, J., Feng, Y., Zhu, Q. and Sarkis, J. (2018), "Green supply chain management and the circular economy: reviewing theory for advancement of both fields", *International Journal of Physical Distribution and Logistics Management*, Vol. 48 No. 8, pp. 794-817.
- Lund, R.I. (1984), "Remanufacturing", *Technology Review*, Vol. 87 No. 2, pp. 18-23.
- McKinsey (2020), "Adapting to the next normal in retail: the customer experience imperative", available at: <https://www.mckinsey.com/industries/retail/our-insights/adapting-to-the-next-normal-in-retail-the-customer-experience-imperative#>.
- Michaud, C. and Llerena, D. (2011), "Green consumer behaviour: an experimental analysis of willingness to pay for remanufactured products", *Business Strategy and the Environment*, Vol. 20 No. 6, pp. 408-420.
- Miller, A. (2002), *Subset Selection in Regression*, CRC Press, New York.
- Minnema, A., Bijmolt, T.H., Petersen, J.A. and Shulman, J.D. (2018), "Managing product returns within the customer value framework", *Customer Engagement Marketing*, Palgrave Macmillan, Cham, pp. 95-118.
- Mitchell, V.W. (1999), "Consumer perceived risk: conceptualisations and models", *European Journal of Marketing*, Vol. 33 Nos 1/2, pp. 163-195.
- Mitchell, V.W. and McGoldrick, P.J. (1996), "Consumer's risk-reduction strategies: a review and synthesis", *International Review of Retail, Distribution and Consumer Research*, Vol. 6 No. 1, pp. 1-33.
- Mollenkopf, D.A., Rabinovich, E., Laseter, T.M. and Boyer, K.K. (2007), "Managing internet product returns: a focus on effective service operations", *Decision Sciences*, Vol. 38 No. 2, pp. 215-250.
- Mollenkopf, D.A., Frankel, R. and Russo, I. (2011), "Creating value through returns management: exploring the marketing-operations interface", *Journal of Operations Management*, Vol. 29 No. 5, pp. 391-403.
- Mowen, J. and Minor, M. (1998), *Consumer Behavior*, Prentice-Hall, Englewood Cliffs, New Jersey, NJ.
- Mugge, R., Jockin, B. and Bocken, N. (2017), "How to sell refurbished smartphones? An investigation of different customer groups and appropriate incentives", *Journal of Cleaner Production*, Vol. 147, pp. 284-296.
- Mukhopadhyay, S.K. and Setaputra, R. (2007), "A dynamic model for optimal design quality and return policies", *European Journal of Operation Resesarch*, Vol. 180 No. 3, pp. 1144-1154.
- Murfield, M., Boone, C.A., Rutner, P. and Thomas, R. (2017), "Investigating logistics service quality in Omni-Channel retailing", *International Journal of Physical Distribution and Logistics Management*, Vol. 47 No. 4, pp. 263-296.

- Nepomuceno, M.V., Laroche, M. and Richard, M.O. (2014), "How to reduce perceived risk when buying online: the interactions between intangibility, product knowledge, brand familiarity, privacy and security concerns", *Journal of Retailing and Consumer Services*, Vol. 21 No. 4, pp. 619-629.
- Neto, J.Q.F., Bloemhof, J. and Corbett, C. (2016), "Market prices of remanufactured, used and new items: evidence from eBay", *International Journal of Production Economics*, Vol. 171 No. 3, pp. 371-380.
- Nunally, J.C. and Bernstein, I.H. (1994), *Psychometric Theory*, 3rd ed., McGraw-Hill, New York, NY.
- Oghazi, P., Karlsson, S., Hellström, D. and Hjort, K. (2018), "Online purchase return policy leniency and purchase decision: mediating role of consumer trust", *Journal of Retailing and Consumer Services*, Vol. 41, pp. 190-200.
- Pei, Z., Paswan, A. and Yan, R. (2014), "E-tailer's return policy, consumer's perception of return policy fairness and purchase intention", *Journal of Retailing and Consumer Services*, Vol. 21 No. 3, pp. 249-257.
- Peinkofer, S.T., Esper, T.L., Smith, R.J. and Williams, B.D. (2015), "Assessing the impact of price promotions on consumer response to online stockouts", *Journal of Business Logistics*, Vol. 36 No. 3, pp. 260-272.
- Peinkofer, S.T., Esper, T. and Howlett, E. (2016), "Hurry! Sale ends soon: the impact of limited inventory availability disclosure on consumer responses to online stockouts", *Journal of Business Logistics*, Vol. 37 No. 3, pp. 231-246.
- Perdue, B.C. and Summers, J.O. (1986), "Checking the success of manipulations in marketing experiments", *Journal of Marketing Research*, Vol. 23 No. 4, pp. 317-326.
- Peter, J.P. and Ryan, M.J. (1976), "An investigation of perceived risk at the brand level", *Journal of Marketing Research*, Vol. 13 No. 2, pp. 184-188.
- Petersen, J.A. and Kumar, V. (2009), "Are product returns a necessary evil? Antecedents and consequences", *Journal of Marketing*, Vol. 73 No. 3, pp. 35-51.
- Petersen, J.A. and Kumar, V. (2015), "Perceived risk, product returns, and optimal resource allocation: evidence from a field experiment", *Journal of Marketing Research*, Vol. 52 No. 2, pp. 268-285.
- Pires, G., Stanton, J. and Eckford, A. (2004), "Influences on the perceived risk of purchasing online", *Journal of Consumer Behavior*, Vol. 4 No. 2, pp. 118-131.
- Rallo, J. (2019), "The rise of refurbished products", available at: [https://www.liquidityservices.com/wp-content/uploads/2018/07/wp\\_rtc0101\\_1502.pdf](https://www.liquidityservices.com/wp-content/uploads/2018/07/wp_rtc0101_1502.pdf) (accessed 8 January 2019).
- Rao, A.R. and Monroe, K.B. (1989), "The effect of price, brand name, and store name on buyers' perceptions of product quality: an integrative review", *Journal of Marketing Research*, Vol. 26 No. 3, pp. 351-357.
- Rao, S., Lee, K.B., Connelly, B. and Iyengar, D. (2018), "Return time leniency in online retail: a signaling theory perspective on buying outcomes", *Decision Sciences*, Vol. 49 No. 2, pp. 275-305.
- Rohm, A.J. and Swaminathan, V. (2004), "A typology of online shoppers based on shopping motivations", *Journal of Business Research*, Vol. 57 No. 7, pp. 748-757.
- Roselius, T. (1971), "Consumer rankings of risk reduction methods", *Journal of Marketing*, Vol. 35, pp. 56-61.
- Rungtusanatham, M., Wallin, C. and Eckerd, S. (2011), "The Vignette in a scenario-based role-playing experiment", *Journal of Supply Chain Management*, Vol. 47 No. 3, pp. 9-16.
- Russo, I., Confente, I., Scarpi, D. and Hazen, B. (2019), "From trash to treasure: the impact of consumer perception of bio-waste products in closed-loop supply chains", *Journal of Cleaner Production*, Vol. 218, pp. 966-974.
- Russo, I., Pellathy, D. and Omar, A. (2020), "Managing outsourced reverse supply chain operations: middle-range theory development", *Journal of Supply Chain Management*, Vol. ahead-of-print No. ahead-of-print, doi: [10.1111/jscm.12244](https://doi.org/10.1111/jscm.12244).

- Stank, T.P., In, J., Pellathy, D.A., Mollenkopf, D.A. and Bell, J.E. (2017), "New frontiers in logistics research: theorizing at the middle range", *Journal of Business Logistics*, Vol. 38 No. 1, pp. 6-17.
- Supply Chain Quarterly (staff) (2020 online), "Survey: returns experience critical to customer satisfaction", available at: <https://www.supplychainquarterly.com/articles/3625-survey-returns-experience-critical-to-customer-satisfaction>.
- Sweeney, J.C., Soutar, G.N. and Johnson, L.W. (1999), "The role of perceived risk in the quality-value relationship: a study in a retail environment", *Journal of Retailing*, Vol. 75 No. 1, pp. 77-105.
- Ta, H., Esper, T.L. and Hofer, A. (2015), "Business-to-Consumer (B2C) collaboration: rethinking the role of consumers in supply chain management", *Journal of Business Logistics*, Vol. 36 No. 1, pp. 133-134.
- Ta, H., Esper, T.L. and Rossiter Hofer, A. (2018), "Designing crowdsourced delivery systems: the effect of driver disclosure and ethnic similarity", *Journal of Operations Management*, Vol. 60 No. 2018, pp. 19-33.
- Taylor, J.W. (1974), "The role of risk in consumer behavior", *The Journal of Marketing*, Vol. 38 No. 2, pp. 54-60.
- Terhanian, G. and Bremer, J. (2012), "A smarter way to select respondents for surveys", *International Journal of Market Research*, Vol. 54 No. 6, pp. 751-780.
- Tokar, T. (2010), "Behavioral research in logistics and supply chain management", *The International Journal of Logistics Management*, Vol. 21 No. 1, pp. 89-103.
- Vafadarnikjoo, A., Mishra, N., Govindan, K. and Chalvatzis, K. (2018), "Assessment of consumers' motivations to purchase a remanufactured product by applying fuzzy delphi method and single valued Neutrosophic sets", *Journal of Cleaner Production*, Vol. 196, pp. 230-244.
- Van den Poel, D. and Leunis, J. (1996), "Perceived risk and risk reduction strategies in mail-order versus retail store buying", *International Review of Retail, Distribution and Consumer Research*, Vol. 6 No. 4, pp. 351-371.
- van Weelden, E., Mugge, R. and Bakker, C. (2016), "Paving the way towards circular consumption: exploring consumer acceptance of refurbished mobile phones in the Dutch market", *Journal of Cleaner Production*, Vol. 113, pp. 743-754.
- Walsh, G., Albrecht, A.K., Kunz, W. and Hofacker, C. (2016), "Relationship between online retailers' reputation and product returns", *British Journal of Management*, Vol. 27 No. 1, pp. 3-20.
- Wang, Y. and Hazen, B.T. (2016), "Consumer product knowledge and intention to purchase remanufactured products", *International Journal of Production Economics*, Vol. 181, pp. 460-469.
- Wang, Y., Wiegerinck, V., Krikke, H. and Zhang, H. (2013), "Understanding the purchase intention towards remanufactured product in closed-loop supply chains: an empirical study in China", *International Journal of Physical Distribution and Logistics Management*, Vol. 43 No. 10, pp. 866-888.
- Wang, Y., Hazen, B.T. and Mollenkopf, D.A. (2018a), "Consumer value considerations and adoption of remanufactured products in closed-loop supply chains", *Industrial Management and Data System*, Vol. 118 No. 2, pp. 480-498.
- Wang, Y., Huscroft, J.R., Hazen, B.T. and Zhang, M. (2018b), "Green information, green certification and consumer perceptions of remanufactured automobile parts", *Resources, Conservation and Recycling*, Vol. 128, pp. 187-196.
- Whetten, D.A. (2009), "An examination of the interface between context and theory applied to the study of Chinese organizations", *Management and Organization Review*, Vol. 5 No. 1, pp. 29-55.
- Wood, S.L. (2001), "Remote purchase environments: the influence of return policy leniency on two-stage decision processes", *Journal of Marketing Research*, Vol. 38 No. 2, pp. 157-169.
- Xu, X., Zeng, S. and He, Y. (2017), "The influence of E-services on customer online purchasing behavior toward remanufactured products", *International Journal of Production Economics*, Vol. 187, pp. 113-125.

- Yoo, B., Donthu, N. and Lee, S. (2000), "An examination of selected marketing mix elements and brand equity", *Journal of the Academy of Marketing Science*, Vol. 28 No. 2, pp. 195-211.
- Zeithaml, V.A. (1988), "Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence", *Journal of Marketing*, Vol. 52 No. 3, pp. 2-22.
- Zhang, T., Wang, W.Y.C., Cao, L. and Wang, Y. (2019), "The role of virtual try-on technology in online purchase decision from consumers' aspect", *Internet Research*, Vol. 29 No. 3, pp. 529-551.
- Zinn, W. and Goldsby, T.J. (2017), "The role of academic research in supply chain practice: how much are we contributing?", *Journal of Business Logistics*, Vol. 38 No. 4, pp. 236-237.

### Appendix

The supplementary material is available online for this article.

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