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

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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).
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 Weelde 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
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<tr>
<td>Abbey et al. (2015a)</td>
<td>Consumer preferences based on economic utility theory</td>
<td>Experimental study</td>
<td>Attractiveness preference ratings</td>
<td>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.</td>
<td>Technology, household and personal care</td>
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<td>Abbey et al. (2015b)</td>
<td>Consumer preferences based on economic theory</td>
<td>Experimental study</td>
<td>Attractiveness preference ratings</td>
<td>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.</td>
<td>Technology, household and personal care products</td>
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<td>Abbey et al. (2017)</td>
<td>Link between CLSC literature and the field of decision theory under risk and uncertainty</td>
<td>Survey and experimental studies</td>
<td>Willingness-to-pay</td>
<td>The study empirically verifies the significance and distribution of discount factors for remanufactured electronics products among consumers.</td>
<td>Technology (Apple IPhone)</td>
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<td>De Vicente Bittar (2018)</td>
<td>Signaling theory</td>
<td>Experimental study</td>
<td>Purchase intention</td>
<td>The study determines that brand equity plays a role in leveraging remanufactured products, even though it is associated with price setting.</td>
<td>Technology (laptop)</td>
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<td>Gaur et al. (2018)</td>
<td>Cultural divergence theory (CDT) and</td>
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<td>Purchase intention</td>
<td>The manuscript identifies cross-cultural differences for reconstructed</td>
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<td>Hazen et al. (2012)</td>
<td>Ambiguity aversion theory</td>
<td>Survey</td>
<td>Willingness-to-pay</td>
<td>This article asserts that the consumer’s willingness to pay for remanufactured</td>
<td>Personal electronics; home</td>
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<td>Hazen et al. (2017a)</td>
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<td>Hazen et al. (2017b)</td>
<td>Push–pull–mooring (PPM) theory</td>
<td>Survey</td>
<td>Switching intention</td>
<td>The outcomes advice that consumers’ attitude toward remanufactured products</td>
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<td>plays an important role in predicting consumer switching behavior</td>
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<td>Jiménez-Parra et al. (2014)</td>
<td>Theory of planned behavior</td>
<td>Survey</td>
<td>Purchase intention</td>
<td>This paper investigates the main determinants of the purchase intentions</td>
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<td>Khor and Hazen (2017)</td>
<td>Theory of planned behavior</td>
<td>Survey</td>
<td>Purchase intention vs.</td>
<td>This study researches how consumer attitude, subjective norms and perceived</td>
<td>Electronic and electrical</td>
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<td>Michaud and Leerena (2011)</td>
<td>Not specified</td>
<td>Experimental auctions</td>
<td>Willingness-to-pay</td>
<td>This paper suggests that consumers evaluate remanufactured products less than conventional products, unless they are advised about their corresponding environmental impact</td>
<td>Technology (camera)</td>
<td>Not specified</td>
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<td>Mugge et al. (2017)</td>
<td>Engel, Kollatt, &amp; Blackwell (EKB) decision-making model, the Theory of perceived risk, and perceived benefit</td>
<td>Survey</td>
<td>Purchase intention</td>
<td>This article investigates consumer response toward refurbished smartphones and the impact of different incentives for different customer groups</td>
<td>Technology (smartphone)</td>
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<td>Neto et al. (2016)</td>
<td>Information asymmetry</td>
<td>Ebay data set</td>
<td>Willingness-to-pay</td>
<td>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</td>
<td>Technology (Ipod)</td>
<td>Online</td>
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<td>Russo et al. (2019)</td>
<td>Prospect theory</td>
<td>Survey</td>
<td>Purchase intention, willingness-to-pay and switching intention</td>
<td>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</td>
<td>Furniture products (chairs)</td>
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<td>Vafadarnikjoo et al. (2018)</td>
<td>Neutrosophic set theory</td>
<td>Survey</td>
<td>Purchase intention</td>
<td>This paper investigates the leading motivational drivers for purchasing a remanufactured bike based on consumers’ and experts’ point of view</td>
<td>Bike</td>
<td>Not specified</td>
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<td>van Weeldend et al. (2016)</td>
<td>Theory of risk categorization</td>
<td>Interviews</td>
<td>Consumer’s acceptance of refurbished products</td>
<td>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</td>
<td>Technology (mobile phone)</td>
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<tr>
<td>Wang et al.</td>
<td>Theory of perceived risk, theory of planned behavior</td>
<td>Survey</td>
<td>Purchase intention</td>
<td>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.</td>
<td>Automobile parts</td>
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<td>Wang et al.</td>
<td>Diffusion of innovation theory</td>
<td>Survey</td>
<td>Purchase intention</td>
<td>Findings suggest that perceived risk partially mediates the relationship between perceived quality and perceived value.</td>
<td>Automobile parts</td>
<td>Not specified</td>
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<td>Wang et al.</td>
<td>Regulatory focus theory</td>
<td>Survey</td>
<td>Purchase intention</td>
<td>This paper explores how the information regarding green attributes of remanufacturing products and green certification plays a role in influencing consumer perceptions.</td>
<td>Automobile parts</td>
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<td>Xu et al. (2017)</td>
<td>Utility theory, transaction cost theory and market signal theory</td>
<td>Ebay auction data set and fixed price dataset</td>
<td>Willingness-to-pay</td>
<td>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.</td>
<td>Technology (Apple iPad 2)</td>
<td>Online</td>
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Table 1. The challenge of remanufactured products
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. Constantides, 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 distribution channel structure

The distribution channel structure through which remanufactured products are sold might inhibit or encourage consumers’ purchase of such products from a retailer (Zinn 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),
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) × 2 (return policy leniency: lenient vs. restricted) × 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 ($M_{Lenient} = 5.93$) than participants exposed to a restricted returns policy ($M_{Restricted} = 3.3$), 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_{lenient\_new\_store} = 4.57; M_{lenient\_new\_online} = 5.17; M_{strict\_new\_store} = 4.75; M_{strict\_new\_online} = 4.60; M_{lenient\_remanufactured\_store} = 5.75; M_{lenient\_remanufactured\_online} = 5.10; M_{strict\_remanufactured\_store} = 5.00; M_{strict\_remanufactured\_online} = 4.75).
Main experiment

Sample and manipulation check. For the main experiment, we applied a 2 (product type: new vs. remanufactured) × 2 (return policy leniency: lenient vs. restricted) × 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. 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 (Nunally 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;
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.

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

**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

Table 3. Correlations

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.
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>
<thead>
<tr>
<th>Variable</th>
<th>Categories</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>38.7%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>61.3%</td>
</tr>
<tr>
<td>Prior return</td>
<td>No prior return</td>
<td>30.1%</td>
</tr>
<tr>
<td></td>
<td>Prior return</td>
<td>69.9%</td>
</tr>
<tr>
<td>Dummy income</td>
<td>£29,999</td>
<td>50.3%</td>
</tr>
<tr>
<td></td>
<td>≥ £29,999</td>
<td>49.7%</td>
</tr>
<tr>
<td>Dummy education</td>
<td>Less than some college education</td>
<td>45.0%</td>
</tr>
<tr>
<td></td>
<td>At least some college education</td>
<td>55.0%</td>
</tr>
</tbody>
</table>

Table 4. Descriptive statistics for categorical variables

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

Table 5. Process model 4

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 (βP×L = 0.401, p < 0.05) (see Table 6), but the interaction between product type and retail channel is not significant (βP×C = −0.159, p = 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 (effectbrick-and-mortar = 0.274, CI[0.116; 0.438] and effectonline = 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 (effectlenient = 0.027; CI [−0.115; 0.174] and effectstrict = 0.102, CI [−0.046; 0.256]) (see

<table>
<thead>
<tr>
<th>DV</th>
<th>Model 1 Perceived risk</th>
<th>Model 2 Purchase intention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>−0.226 (0.249)</td>
<td>−0.595*** (0.199)</td>
</tr>
<tr>
<td>Leniency (L)</td>
<td>−0.912*** (0.134)</td>
<td>0.982*** (0.115)</td>
</tr>
<tr>
<td>Product (P)</td>
<td>0.502*** (0.165)</td>
<td>−0.012 (0.134)</td>
</tr>
<tr>
<td>Channel (C)</td>
<td>0.007 (0.132)</td>
<td>−0.235** (0.106)</td>
</tr>
<tr>
<td>P×L</td>
<td>0.401** (0.187)</td>
<td>−0.163 (0.151)</td>
</tr>
<tr>
<td>P×C</td>
<td>−0.159 (0.186)</td>
<td>0.191 (0.149)</td>
</tr>
<tr>
<td>Age</td>
<td>0.006* (0.003)</td>
<td>0.02 (0.003)</td>
</tr>
<tr>
<td>Gender</td>
<td>0.299*** (0.102)</td>
<td>0.271*** (0.083)</td>
</tr>
<tr>
<td>Prior return</td>
<td>−0.268** (0.104)</td>
<td>−0.062 (0.085)</td>
</tr>
<tr>
<td>Return intention</td>
<td>0.178*** (0.050)</td>
<td>0.055 (0.041)</td>
</tr>
<tr>
<td>Dummy income</td>
<td>0.163* (0.096)</td>
<td>0.080 (0.077)</td>
</tr>
<tr>
<td>Dummy education</td>
<td>−0.020 (0.097)</td>
<td>−0.145* (0.077)</td>
</tr>
<tr>
<td>Perceived risk</td>
<td>0.458*** (0.047)</td>
<td>0.458*** (0.047)</td>
</tr>
<tr>
<td>F-value (df)</td>
<td>11.87 (11.290)**</td>
<td>34.54 (12.289)**</td>
</tr>
<tr>
<td>R²</td>
<td>0.31</td>
<td>0.59</td>
</tr>
</tbody>
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Indices of moderated mediation

<table>
<thead>
<tr>
<th></th>
<th>Model 1 Perceived risk</th>
<th>Model 2 Purchase intention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leniency</td>
<td>−0.184</td>
<td>CI [−0.358; −0.0123]</td>
</tr>
<tr>
<td>Store</td>
<td>0.073</td>
<td>CI [−0.089; 0.248]</td>
</tr>
</tbody>
</table>

Note(s): p < 0.01***; p < 0.05**; p < 0.1*; standard errors for the coefficients are reported in parentheses.
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; 0.095] (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 that 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 Janakiriman 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
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.

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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
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


**Appendix**

The supplementary material is available online for this article.

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