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Article

Online Search and In-Store Purchase Webrooming: The Mediating Role of Perceived Risk and the Moderating Role of Product Type

Suhaib B Bani Kinana[1]

[1] Faculty of Economics & Business, Complutense University of Madrid, Madrid, Spain, Email: suhaibba@ucm.es

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Abstract

This paper explores webrooming intention determinants by analyzing the contributions of online trust, perceived risk, and need to touch in an integrated omnichannel context. In particular, it investigates the mediating effect of the perceived risk and the moderating effect of the type of product (high-touch products versus low-touch products). A stratified random sampling strategy was used to collect data on 900 consumers in Jordan, Saudi Arabia, and Palestine to increase the representativeness. The partial least squares structural equation modeling (PLS-SEM) was used to test the proposed model. The results show that online trust has a significant negative impact on perceived risk and a positive impact on webrooming intention. Perceived risk, in its turn, positively affects webrooming intention strongly and mediates the connection between online trust and webrooming behavior partially. Also, need for touch proves to be a strong predictor of the webrooming intention, which confirms the role of sensory motivation in the decision-making process in the omnichannel. The product type moderating effect was, however, not supported. Multi-group analysis also reveals that the structural relations are similar in the three countries. The paper is important to the literature on omnichannel retailing because it offers a risk-based account of webrooming behavior and shows that trust is a twofold phenomenon, acting as both a direct and indirect motivation. It also has some practical implications to the retailer in the sense that it highlights the need to incorporate online trust-building tools with the in-store experience in order to improve consumer decision-making.

Keywords: webrooming intention; online trust; perceived risk; product type; need for touch.

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1. Introduction

The fast development of digital technologies has led to a radical change in the consumer decision-making process, especially in cases of purchasing retail products or services from multiple channels, including online and offline communication channels. Consumers can also easily switch channels, searching information online and purchasing in the brick-and-mortar stores, which is commonly known as webrooming (Arora & Sahney, 2019; Gensler et al., 2012). The fusion of the benefits of online search and the guarantee of purchasing in-store has made webrooming a strategically useful behavior that can enhance the work of retailers (Goraya et al., 2022; Shankar & Jain, 2021). This is unlike showrooming that has over the years been widely researched in literature considering that it can destabilize physical retailers. Although webrooming is increasingly becoming common, there is not enough knowledge of the psychological mechanisms that are influencing consumers to practice webrooming especially in new multichannel markets.

From a theoretical perspective, webrooming behavior can be understood through the lens of uncertainty reduction theory, which suggests that consumers actively seek information and alternative channels to minimize uncertainty during the decision-making process (Yadav et al., 2024). In omnichannel environments, perceived risk theory further explains this behavior by emphasizing that consumers evaluate potential negative outcomes, such as financial, functional, and privacy risks, when making purchase decisions (Featherman & Pavlou, 2003; Stone & Grønhaug, 1993). Consequently, webrooming can be interpreted as a risk-reduction strategy, where consumers combine online information search with offline purchase to mitigate uncertainty and enhance decision confidence.

We also argue that the perception of risk is a major constituent that contributes substantially to the consumer behavior in traditional and electronic commerce. This will require a more detailed and theoretically informed conceptualization of perceived risk (PR) in omnichannel research (Alrawad et al., 2023; Phamthi et al., 2024). Recent empirical evidence shows that not all the elements of risk, but only some of them, namely, functional, financial, and privacy risks, influence purchase-related decisions significantly. Such results lead to the need of more specific and theory-based conceptualization of PR.

In addition, trust theory provides a complementary explanation for how consumers cope with uncertainty in online environments. Trust is conceptualized as a mechanism that reduces perceived uncertainty by increasing confidence in the reliability, integrity, and competence of online vendors (Gefen et al., 2003; McKnight et al., 2002). Prior research suggests that trust not only directly influences behavioral intentions but also indirectly shapes decision-making by lowering perceived risk associated with online transactions (Rouibah et al., 2016; Alrawad et al., 2023). Therefore, integrating trust and perceived risk offers a more comprehensive theoretical framework to explain why consumers engage in hybrid behaviors such as webrooming.

This is accomplished by removing the anxiety that customers have regarding opportunism, security, and information asymmetry (Gefen et al., 2003; McKnight et al., 2002). However, despite the fact that trust has been a significant factor that has been investigated as a predictor of the intention to make a purchase online, it is less likely to be observed in hybrid behaviors such as webrooming. The lack of trust in online channels may not necessarily preclude consumers from engaging in online search activities; rather, it may cause

customers to migrate to offline purchases as a risk-reduction strategy (Aw, 2020; Kleinlercher et al., 2020; Alrawad et al., 2023). This slight effect of trust demonstrates the need of researching PR as a mediator variable between online trust (OT) and webrooming intention (WR) rather than assuming that there is a straight relationship between the two.

Building on these perspectives, the interaction between trust and PR becomes central in explaining omnichannel behavior. While trust reduces uncertainty and facilitates online engagement, residual risk perceptions may still motivate consumers to shift to offline channels for final purchase decisions. This dual mechanism highlights the importance of examining PR as a mediating variable in the relationship between OT and WR.

Moreover, there are individual differences and product-related characteristics that also influence webrooming behavior. A consumer trait called "need for touch" is especially relevant to goods because it means that people like to get information about products through touch (Flavián et al., 2019; Peck & Childers, 2003). The high-need-touch consumers will tend to want to touch the products in order to determine quality and suitability and thus they will be more inclined to indulge in webrooming. In addition to this individual level aspect, the product type (PT), namely, the difference between high-touch and low-touch products, is a moderating factor of the intensity of the risk-related effects (Quach et al., 2022; Chen et al., 2021; Nelson, 1970, 1974). People who buy clothes or personal care items that are touched a lot are more likely to have higher levels of experiential uncertainty and sensory assessment needs. This makes the effect of PR on channel switching behavior stronger (Flavián et al., 2019; Heitz-Spahn, 2013).

In spite of these revelations, there are several gaps in literature. To begin with, PR has mostly been studied in the past in relation to online purchase intention or via fragmented risk dimensions, providing little insight into the mediating effect of PR in the webrooming process (Alrawad et al., 2023; Forsythe & Shi, 2003). Second, although the PT and consumer characteristics have been recognized as having an impact, little is known about the interaction of these factors with PR in determining WR, especially in new omnichannel settings (Lavuri & Thaichon, 2025; Yadav et al., 2024). Third, the empirical data on the Middle East markets remains limited, even though the area is rapidly becoming digital and has unique cultural and retail specifics (Alsulaimani, 2024; Rouibah et al., 2016).

To fill these gaps, this research constructs and evaluates an integrated model of webrooming behavior, which includes the mediating role of PR, which is conceptualized by functional, financial, and privacy dimensions, and the moderating role of PT (high touch vs. low touch). The study uses survey data gathered among consumers in Jordan, Saudi Arabia, and Palestine to answer the following main research question: How do OT and PR interact to affect consumer WR, and how does the PT moderate this relationship? In this way, the research will be added to the body of omnichannel retailing literature by offering a more risk-focused, nuanced explanation of webrooming behavior and practical advice to the retailer that is currently operating in digitally transforming markets.

2. Review of the Literature and Development of Hypothesis

2.1 Omnichannel Consumer Behavior Webrooming

The increasing convergence of online and offline retail has transformed consumer buying experiences and cross-channel practices have become common. Consumers are integrating online and offline touchpoints

more and more to maximize the quality of the decisions and minimize uncertainty (Gensler et al., 2012; Huré et al., 2017; Barann et al., 2022). In this omnichannel environment, webrooming, or shopping product information on the Internet and making the purchase at the physical level, has become a clear and strategically significant phenomenon (Arora & Sahney, 2019; Aw, 2020).

According to previous studies, webrooming is not a behavior of convenience but a strategic approach to the combination of informational benefits of online space with the experiential and assurance benefits of buying in the store (Flavián et al., 2019; Chang & Li, 2022). Empirical research shows that webrooming may lead to high consumer confidence, satisfaction, and perceived decision quality, and also to positive results among retailers in terms of higher conversion rates and channel synergy (Cui et al., 2022; Goraya et al., 2022; Herhausen et al., 2015). Regardless of these developments, the psychological processes that lead consumers to webrooming, especially the ones involving trust and PR, are still disjointed in the literature and should be integrated through further studies.

2.2 Research Model and Hypothesis Development

An overview of the existing previous studies shows that the studies of the role of PR in forming the purchase decision made by consumers have been predominantly conducted within the context of single-channel shopping, online or offline, with little consideration of the hybrid decision-making. As the adoption of online and physical retail platforms has intensified, consumers have increasingly adopted webrooming behavior, which is the use of online sources of product information and physical store purchase, as a method of reducing uncertainty and increasing the confidence of the decision (Arora & Sahney, 2019; Aw, 2020; Gasparin et al., 2022). The current study is based on PR theory and trust-based perspectives in electronic commerce, and it is proposed that the conceptual model of the study is based on the PR as a mediating variable between OT and WR. According to prior studies, OT decreases the perceptions of functional, financial, and privacy related risks linked to shopping setup online (Gefen et al., 2003; McKnight et al., 2002), and the increased PR can encourage consumers to complete their purchases in the brick-and-mortar store after searching online. Moreover, the model also includes need for touch (NT) as a personal characteristic that has a direct impact on WR since it represents the desire of consumers to have a sense of the product when evaluating it (Flavián et al., 2019; Peck & Childers, 2003). Taking into account the fact that the PR may not be relevant to all types of products, PT is presented as a moderating variable that differentiates between high-touch and low-touch products so that the influence of PR on WR should be different according to the degree to which physical inspection is necessary before purchasing a product (Goraya et al., 2022; Heitz-Spahn, 2013; Nelson, 1970). In line with this, the proposed research model incorporates OT, PR, NT, and PT to describe WR as shown in Figure 1.

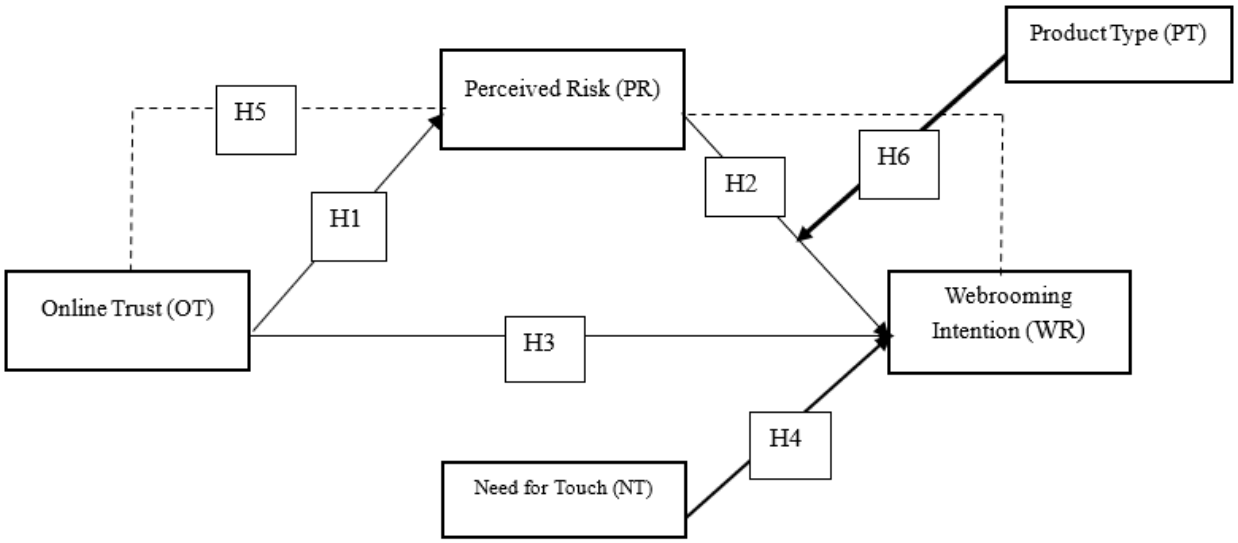

Figure 1 Hypothesized model

2.2.1 Perceived Risk and Online Trust

OT is one of the core aspects of consumer behavior in an online context where there is uncertainty and information asymmetry. OT in e-commerce situations is a measure of the trust that the consumer has in the integrity, competence, and reliability of an online retailer and the security of the technological infrastructure used to execute the transaction (Gefen et al., 2003). There is much evidence that trust is a key factor in influencing the judgments of customers regarding online channels and their readiness to conduct digital interactions (Jadil et al., 2022; Rouibah et al., 2016).

PR theory presents a complementary theory to the impact that trust has on consumer decision-making. PR is the subjective anticipation of consumers about the possible negative consequences of purchase, such as financial loss, poor performance of the product, and privacy (Stone & Grønhaug, 1993). In the case of online shopping, such risks are more likely to be increased because of the absence of physical inspection and data security (Forsythe & Shi, 2003). According to previous research, trust is always a risk reducing factor, and the higher the level of OT, the lower the perception of risk in various aspects (Alrawad et al., 2023; Featherman & Pavlou, 2003).

H1. *There is a significant negative effect of OT on PR.*

2.2.2 Perceived Risk and Webrooming Intention

PR has always been considered a key factor in consumer choice of sales channels and purchasing behavior. In cases where consumers feel there is a high degree of risk in online shopping, they may choose to adopt alternative methods to reduce uncertainty and losses (Chen et al., 2021; Firmanshah et al., 2023). Webrooming is one of the most efficient risk reduction options in the omnichannel setting, as it enables consumers to acquire as much information as possible online but check the quality and appropriateness of goods in the store (Aw, 2020; Flavián et al., 2019).

There is evidence that dimensions of risk, the most important of which are functional, financial, and privacy risks, affect the tendency of consumers to avoid making purchases online and changing to offline channels

(Masoud, 2013; Nawi et al., 2019). Shopping after online searching at the store, the consumers can minimize performance uncertainty, prevent possible financial losses, and diminish exposure to threats concerning privacy. In turn, the increased intensity of PR will result in the increased tendency of consumers to webroom.

H2. *There is a significant positive effect of PR on WR.*

2.2.3 Online Trust and Webrooming Intention

OT is acknowledged by many scholars as one of the key determinants of consumer behavior in virtual environments since it addresses uncertainties and improves consumer confidence in online experiences (Gefen et al., 2003). When speaking about omnichannel shopping, it becomes especially important to note that trust plays a crucial role both in enabling online shopping and in helping consumers successfully combine various channels during the shopping process.

The consumers who show high levels of online trust tend to be more confident in using online channels to find information about the products and, therefore, are more engaged in searching for products online (Aw, 2020; Santos & Gonçalves, 2019). However, the use of online resources to gather information does not necessarily correlate with the actual purchase in the online environment but can serve as a prelude to webrooming behavior.

Webrooming is defined as the practice when consumers gather product-related information online but complete the purchases at brick-and-mortar stores. The use of trust in the omnichannel framework helps consumers better integrate online and offline environments and, therefore, leads to more webrooming behavior.

H3. *There is a significant positive effect of OT on WR.*

2.2.4 Webrooming Intention and Need for Touch

The other significant channel choice determinant is individual differences in the processing of sensory information. The NT concept describes the tendency of consumers to consider touch as an input when assessing the products and making purchases (Peck & Childers, 2003). Consumers who have a strong NT are more likely to be dependent on physical interaction to evaluate product features like texture, fit, and quality that are usually hard to determine using online interfaces only.

According to the previous research, consumers who need touch tend to prefer offline channels or use behaviors that can be physically examined before purchasing the product (Flavián et al., 2019; Heitz-Spahn, 2013; Lavuri & Thaichon, 2025). Webrooming offers the best channel through which such consumers can be guided within an omnichannel setting through online search of information and subsequent assessment of the product in the store. In line with this, it is rational to assume that greater need to touch is linked with greater WR.

H4. *There is a significant positive effect of NT on WR.*

2.2.5 The Intermediate Position of Perceived Risk

Combining the theory of trust with the PR theory implies that PR can be one of the most important mechanisms that OT can affect webrooming behavior. Although trust may have a direct impact on the channel preferences of consumers, it also influences behavior indirectly through changes in perceptions of uncertainty and the possibility of loss (Featherman & Pavlou, 2003; Rouibah et al., 2016). Previous studies show that consumers who have lower trust levels are more likely to perceive greater risk in an online transaction, which subsequently leads to compensatory actions, including switching the channel (Alrawad et al., 2023; Yadav et al., 2024).

PR would be the most appropriate theory to explain why consumers who do not have enough trust in online settings still use online sources to search but use offline sources to complete the purchase. This argument justifies the intermediate position of the PR between OT and WR.

H5. *PR significantly mediates the relationship between OT and WR.*

2.2.6 Product Type as a Moderating Effect

Lastly, the nature of products is important in influencing consumer reactions to PR. Based on the information economics theory, products can be generally divided into high-touch (experience-oriented) and low-touch (search-oriented) goods, according to the level of sensory assessment needed before purchase (Nelson, 1970, 1974; Sharma & Fatima, 2024). High-touch products are generally associated with a higher degree of uncertainty and a tangible inspection process, which increases sensitivity to the PR of the consumer.

According to empirical studies, the effect of PR on channel switching behavior is greater with high touch products compared to low-touch products (Chen et al., 2021; Heitz-Spahn, 2013). Based on this, it is assumed that PT will moderate the strength of the relationship between PR and WR resulting in the following hypothesis:

H6. *PT (high touch vs. low touch) significantly moderates the relationship between PR and WR.*

3. Method

3.1 Design

The research design used in this study was quantitative research, which was used to test the relationships between OT, PR, NT, PT, and WR empirically. The survey-based methodology was considered suitable because it is effective to measure the perceptions, attitudes, and behavioral intentions of consumers in large, geographically dispersed samples (Hair et al., 2021). The quantitative framework allows the simultaneous examination of different direct, mediating, and moderating interactions within a single conceptual framework by using SEM. In accordance with the current literature on webrooming and omnichannel consumer behavior, the research methodology adopted makes it easier to test the hypothesis and validate the model since it allows estimating complex causal relationships and indirect effects (Aw, 2020; Kleinlercher et al., 2020). This research design is therefore appropriate to the aim of the research, which is to examine the mediating effect of PR and the moderating effect of PT on WR among consumers.

3.2 Population and Sample

The sample population for this study consisted of adult consumers above 18 years old from Jordan, Saudi Arabia, and Palestine who engaged in webrooming. Being familiar with the webrooming concept was essential for participation. The inclusion criteria for the study involved prior usage of internet searches to discover products and purchase those items in offline shops within the last three months. These criteria increase validity and reliability of the results while being consistent with other webrooming studies (Santos & Goncalves, 2019; Yadav et al., 2024).

A stratified sampling design was used to enhance representativeness of the selected sample. The stratified sampling procedure entailed the selection of samples representing various countries and sub-groups of consumers by key demographics. However, due to the online survey conducted in this study, samples had to be selected using a non-probability convenience approach within each stratum because there was no possibility of random sampling in a cross-national research with limited access to sampling frames (Alrawad et al., 2023).

In particular, the target population of interest was divided into strata based on three countries (Jordan, Saudi Arabia, and Palestine) and several key demographic factors (gender, age, etc.) for enhanced representation in the final data set.

The collection of survey data involved the use of the electronic questionnaire administered to respondents in all three countries. Prior to administering the questionnaires, participants were asked a series of questions to determine eligibility regarding webrooming behavior, geographic location, and recency of experience. A total of 1,100 surveys were sent to each stratum, resulting in the receipt of 900 valid questionnaires. Thus, there were 340 surveys received in Saudi Arabia, 317 in Jordan, and 243 in Palestine. The response rate of 81.8% was considered appropriate in cross-national research of consumer behavior (Alrawad et al., 2023; Hair et al., 2021).

The size of the selected sample is sufficient for conducting SEM, including multi-group models, mediating, and moderating effects analysis (Hair et al., 2021). For further proof of sample representativeness, Table 1 shows demographic variables of selected respondents by country, gender, age, educational qualification, and income.

Table 1 reveals that the sample is fairly representative because respondents were selected evenly among three countries. In addition, the selected sample is gender-balanced with a share of males being equal to 52% compared to 48% for females. As for the age distribution of respondents, the largest proportion of them (63%) were in the 26–45 age bracket, which is the most active group of customers for omnichannel shopping (Flavián et al., 2019). Concerning education, almost 60% of the selected individuals had a university diploma. Lastly, the sample included three income groups – low (21%), middle (52%), and high (27%). This stratified sampling plan, as well as the proportional representation of the sample among the major demographic groups, increases the sample representativeness and allows generalizing the results to the overall population of consumers who practice webrooming behavior in the countries of the study.

Table 1: Demographic variables

Demographic Characteristic	Category	Frequency (n)	Percentage (%)
Country	Saudi Arabia	340	37.8%
	Jordan	317	35.2%
	Palestine	243	27.0%
Gender	Male	468	52.0%
	Female	432	48.0%
Age	18–25 years	198	22.0%
	26–35 years	315	35.0%
	36–45 years	252	28.0%
	46 years and above	135	15.0%
Educational Level	High School or Less	126	14.0%
	Diploma / Bachelor's Degree	522	58.0%
	Postgraduate (Master's/PhD)	252	28.0%
Monthly Income Level	Low: < 500 JD	189	21.0%
	Medium: 500–1000 JD	468	52.0%
	High: > 1000 JD	243	27.0%

3.3 Data Collection Instruments

The structured questionnaire created and distributed by Microsoft Forms was used to collect data, which allowed for efficient data collection and recording of a sufficient number of responses. Data were collected over the period from January 2026 to March 2026. To improve the quality of data, the survey tool was set to reject incomplete forms, thus preventing the inclusion of partially filled questionnaires in the analysis process, and only valid data was saved. Multi-item scales based on existing and validated scales in previous studies were used in measuring all perceptual constructs. The OT was measured with six items based on Gefen et al. (2003) and McKnight et al. (2002), which covered the beliefs of the consumers about reliability, integrity, and confidence with online retailers. The nine dimensions of PR were based on the multidimensional risk framework (Featherman & Pavlou, 2003; Stone & Grønhaug, 1993), which has been extensively utilized in online shopping situations, and they were used to operationalize PR based on various sources of uncertainty. WR was assessed based on six items derived out of the previous research on cross channel and webrooming behavior (Arora & Sahney, 2019; Aw, 2020). The NT was measured based on six items that were based on the scale created by Peck and Childers (2003) to measure the preference of consumers to touch information when evaluating a product, and it has been widely tested in retail studies (Flavián et al., 2019). Everything was measured according to the 5-point Likert scale (“strongly disagree” = 1, “strongly agree” = 5). The operationalization of PT was a binary variable that identified high-touch and low-touch products as 1 and 0, respectively, in line with previous categorizations in the level of sensory assessment needed to make a purchase (Chen et al., 2021; Huang et al., 2009).

3.4 Distributional Assumptions

To determine whether the data is skewed or not, skewness and kurtosis were used to determine the distributional properties of data. These findings show that the skewness values were within the range of -0.104 to 0.091, whereas the kurtosis values were within the range of -2.004 to 0.345. The values are within

the acceptable levels of approximate normal distribution, indicating that there are no serious violations of distributional assumptions (Hair et al., 2021).

Even though PLS-SEM is not sensitive to the multivariate normality, the evaluation of the data distribution will help to increase the strength and plausibility of the findings. Moreover, the non-parametric bootstrapping procedure with 5,000 resamples is also used to provide additional stability and reliability to the parameter estimates despite the slight non-normality deviations (Hair et al., 2021).

On the whole, these findings prove that the data can be used in SEM and the statistical conclusions made after the analysis are valid and not influenced by distributional problems.

4. Result

4.1 Measurement Model

This study employed SEM to evaluate the study model using Smart PLS software. Figure 2 shows that all validity indicators exceeded the required threshold of 0.70, confirming the reliability and readiness of the data for analysis (Hair et al., 2021). This was confirmed by verifying Cronbach's alpha, which expresses internal consistency of the data, and the composite reliability coefficient (CR), both of which exceeded the 70% threshold (Hair et al., 2019). Furthermore, the convergence was verified using the extracted average variance, which exceeded 50% for all variables. Based on these indicators, the measurement model in this study demonstrates a good level of reliability and validity and can be further analyzed using the SEM.

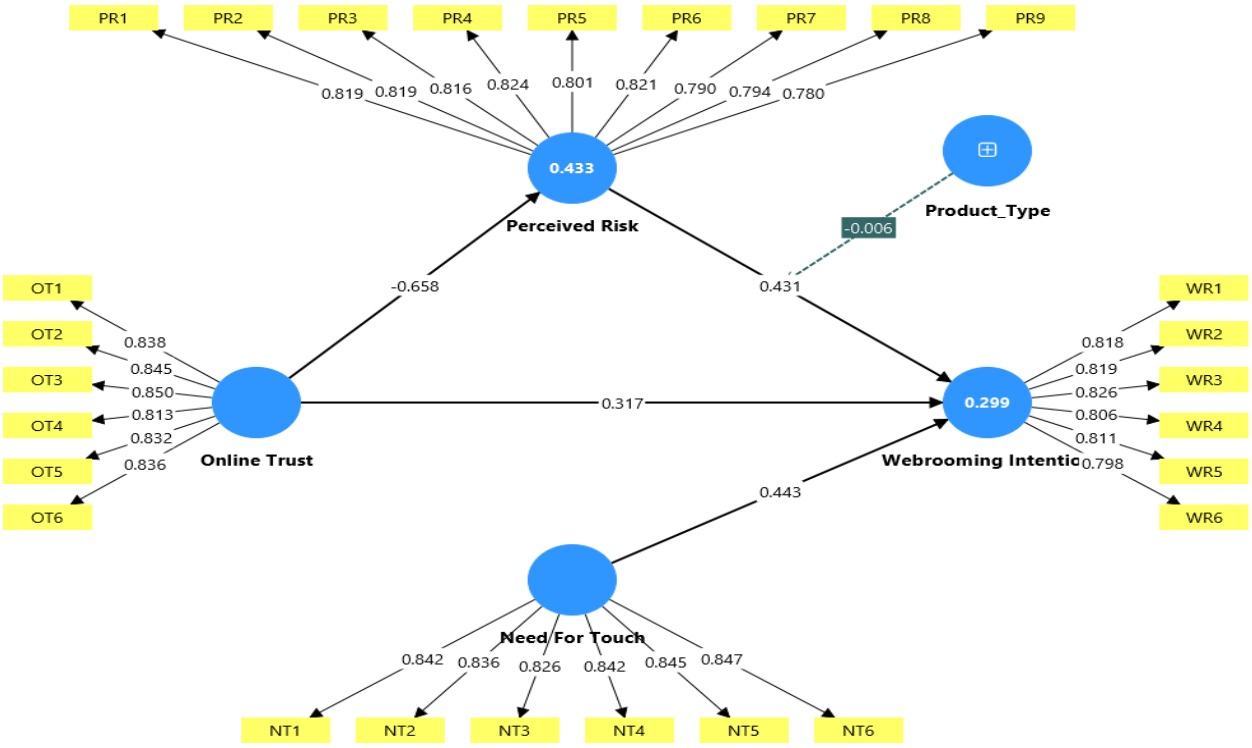

Figure 2: Measurement model

4.2 Discriminant Validity Test

To test discriminatory validity, the Fornell-Larcker and Heterotrait-monotrait (HTMT) criteria were used as shown in Tables 2 and 3, which support discriminatory validity (Fornell & Larcker, 1981).

Table 2: Fornell-Larcker criterion

Construct	NT	OT	PR	PT	WR
NT	**0.840**				
OT	0.047	**0.836**			
PR	0.018	0.658	**0.807**		
PT	0.041	0.037	0.020	**0.871**	
WR	0.438	0.012	0.231	0.055	**0.813**

Furthermore, the HTMT standard was tested to verify structural differentiation. HTMT results were within the recommended range, which is less than 0.90, indicating sufficient discriminatory validity (Henseler et al., 2016). Therefore, the results of the discriminatory validity test confirm sufficient differentiation between the basic structures in this study, thus providing a basis for testing the hypotheses.

Table 3: Heterotrait-monotrait ratio (HTMT) – matrix

Construct	NT	OT	PR	PT	WR
NT					
OT	0.056				
PR	0.033	0.712			
PT	0.042	0.039	0.023		
WR	0.482	0.029	0.252	0.058	

4.3 Measurement Model Validity

Table 4 illustrates the measurement features of the reflective structures. The indicators are characterized by high external loading coefficients exceeding the reliable threshold (Hair & Alamer, 2022).

Table 4: Measurement properties of model

Construct	Items	Convergent		Discriminate	Reliability		
		Outer loading	AVE	Fornell-Larcker Criterion: is the square root of AVE for each construct greater than its correlations with other constructs?	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Cronbach 's alpha
Need for Touch	**NT1**	0.842	0.705	yes	0.917	0.935	0.916
	NT2	0.836					
	NT3	0.826					
	NT4	0.842					
	NT5	0.845					
	NT6	0.847					
Online Trust	**OT1**	0.838	0.698	yes	0.914	0.933	0.914
	OT2	0.845					
	OT3	0.850					
	OT4	0.813					

	OT5	0.832					
	OT6	0.836					
Perceived Risk	**PR1**	0.819	0.652	yes	0.933	0.944	0.933
	PR2	0.819					
	PR3	0.816					
	PR4	0.824					
	PR5	0.801					
	PR6	0.821					
	PR7	0.790					
	PR8	0.794					
	PR9	0.780					
Webrooming Intention	**WR1**	0.818	0.661	yes	0.898	0.921	0.897
	WR2	0.819					
	WR3	0.826					
	WR4	0.806					
	WR5	0.811					
	WR6	0.798					

4.4 Multicollinearity Test (VIF)

To test multicollinearity, the variance inflation factor (VIF) was chosen. The findings indicate that all dimensions are below the recommended threshold of 5, meaning there is no multicollinearity issue between the variables (Hair & Alamer, 2022). Furthermore, the VIF value for the moderating variable (PT) is 1, confirming the absence of problematic variance between it and the other predictive variables. These findings suggest that collinearity is not a problem and that the model's estimates are stable and reliable enough for further structural analysis.

Table 5: Variance inflation factor (VIF) of the model

Items	VIF	Items	VIF	Items	VIF
NT.1	2.410	**OT.4**	2.145	**PR.7**	2.138
NT.2	2.397	**OT.5**	2.316	**PR.8**	2.196
NT.3	2.283	**OT.6**	2.332	**PR.9**	2.087
NT.4	2.425	**PR.1**	2.421	**WR 1**	2.137
NT.5	2.481	**PR.2**	2.429	**WR.2**	2.102
NT.6	2.449	**PR.3**	2.376	**WR.3**	2.180
OT.1	2.395	**PR.4**	2.457	**WR.4**	2.058
OT.2	2.468	**PR.5**	2.241	**WR.5**	2.100
OT.3	2.506	**PR.6**	2.437	**WR 6**	2.014

4.5 Assessment of Potential Biases

The full collinearity test was used to test the problem of endogeneity and common-method bias by comparing the values of the VIF in the measurement model and the structural model. Table 6 results indicate that the VIFs of all variables were less than the critical value of 3.3, as suggested by Hair and Alamer (2022) in the research of PLS-SEM. This finding suggests that there is no problem of high correlation between the underlying variables and proves that the model is not endogenous and that no common-method bias may influence the estimates of the model and the validity of the presumed relationships between the variables.

Table 6: Assessment of potential biases

Path	VIF
NT to WR	1.004
OT to PR	1.000
OT to WR	1.770
Perceived Risk to WR	1.772
PT to WR	1.003
PT x PR to WR	1.005

4.6 Assessment of Model Fit

In the context of PLS-SEM, the evaluation of model fit was conducted through the utilization of several global fit indices, which encompass the standardized root mean square residual (SRMR), d_ULS, d_G, and the normed fit index (NFI). Table 7 illustrates that the SRMR values for both the saturated and estimated models are significantly below the recommended threshold of 0.08, indicating that the models display an acceptable level of fit (Henseler et al., 2016).

Table 7: Model fit indices

	Saturated model	Estimated model
SRMR	0.030	0.031
d_ULS	0.376	0.389
d_G	0.116	0.118
Chi-square	603.223	613.134
NFI	0.962	0.961

The findings for d_ULS and d_G fall within the parameters deemed acceptable, while the NFI values surpass the recommended threshold of 0.90, thereby indicating a notable improvement in comparison to the baseline model (Hair et al., 2021). The indices associated with model fit suggest that the proposed PLS-SEM model exhibits a satisfactory congruence with the data and is thus appropriate for hypothesis testing.

4.7 Structural Model

The SEM of this study was tested using PLS to examine the relationships between NT, OT, PR, PT, and WR. To determine the importance of the coefficients for each path, bootstrapping was used with 5000 redistributed samples. Figure 3 shows the estimated model with path coefficients and interpreted variance (R^2) values for the internal structures. The model describes 43.3 percent of PR variance and 29.9 percent of WR variance, which is moderate explanatory power. The findings give a strong foundation to test the hypotheses that have been put forward on the direct, mediating, and moderating relationship between the study constructs.

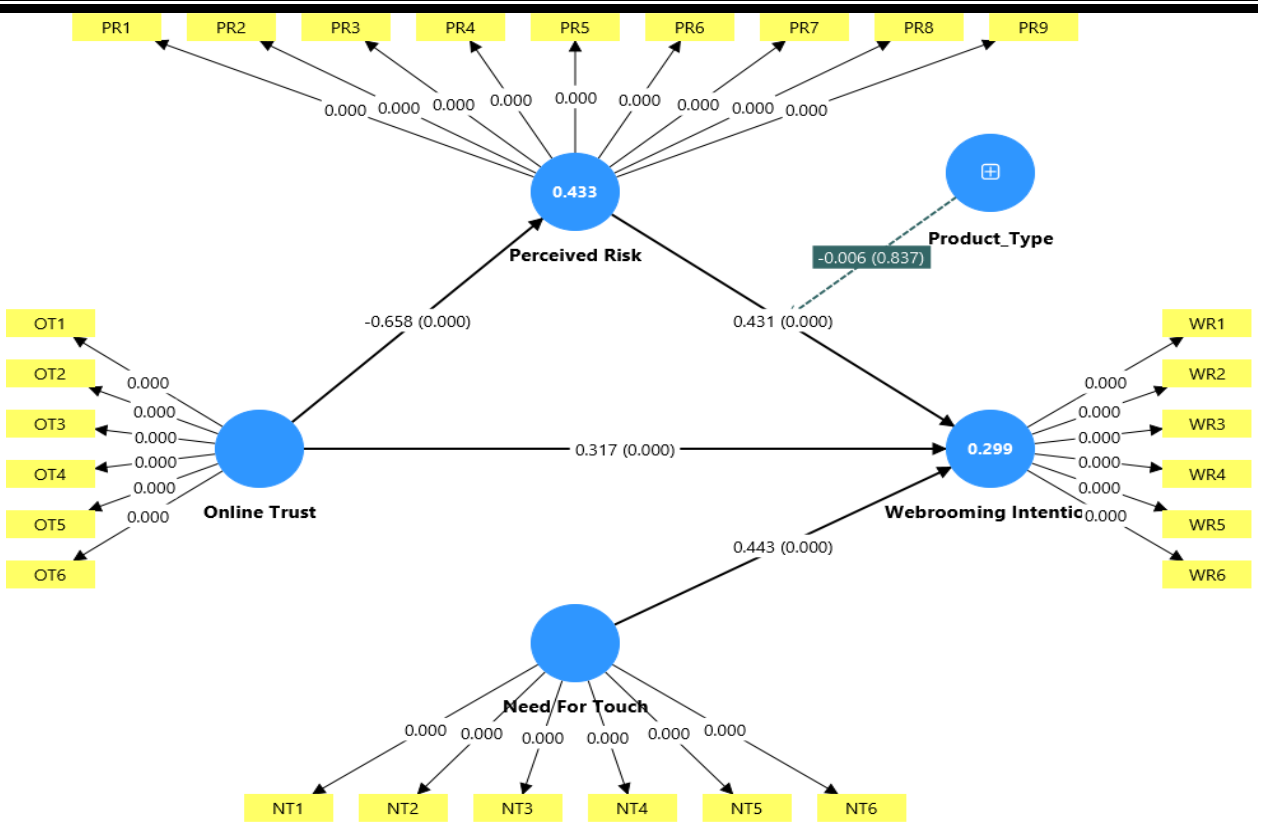

Figure 3: Structural model results

4.8 Hypotheses Testing

Table 8 illustrates the output of the SEM and testing of the study hypotheses. The results indicate that the effect of OT on PR is significantly negative (β = -0.658, p = 0.000); thus, H1 was supported. On the contrary, the results revealed a significantly positive impact of PR on WR (β = 0.431, p = 0.000); thus, H2 was confirmed. In addition, the findings reveal a significantly positive impact of OT on WR (β = 0.317, p = 0.000); therefore, H3 was supported. Also, NT had a significantly positive impact on WR (β = 0.443, p = 0.000); therefore, H4 was confirmed.

Moreover, in terms of mediation, the results show partial mediation because the effect of OT on WR via PR is partly mediated by PR since the direct and indirect effects are significant (β = 0.317, p = 0.000; β = -0.283, p = 0.000). To determine the degree of mediation, variance accounted for (VAF) was estimated to be equal to the indirect effect divided by the total effect; therefore, VAF = 0.283/0.600 = 0.472. Partial mediation means that even though there is an impact of OT on WR, a significant part of that effect is transmitted through PR. Thus, H5 was supported.

Table 8: Structural model results and hypothesis testing

	Path	Direct effect	Indirect effect	Total effect	T-statistics	P-value	Decision
H. 1	OT to PR	-0.658		-0.658	35.112	0.000	Supported
H. 2	PR to WR	0.431		0.431	12.215	0.000	Supported
H. 3	OT to WR	0.317		0.317	9.276	0.000	Supported
H. 4	NT to WR	0.443		0.443	18.300	0.000	Supported
H. 5	OT to PR	-0.658	-0.283	0.034	11.347	0.000	Supported Partial mediation
	PR to WR	0.431					
	OT to WR	0.317					
	OT to PR to WR						
H. 6	PT x PR to WR	-0.006		-0.006	0.206	0.837	Not supported

In terms of moderation, there is no significant effect of the PT ($\beta = -0.006$, $p = 0.837$); thus, H6 was rejected. It means that regardless of whether the product category is high or low touch, the relationship between PR and WR stays the same. Furthermore, Figure 4 shows that the positive relationship of PR on WR is independent of the product category.

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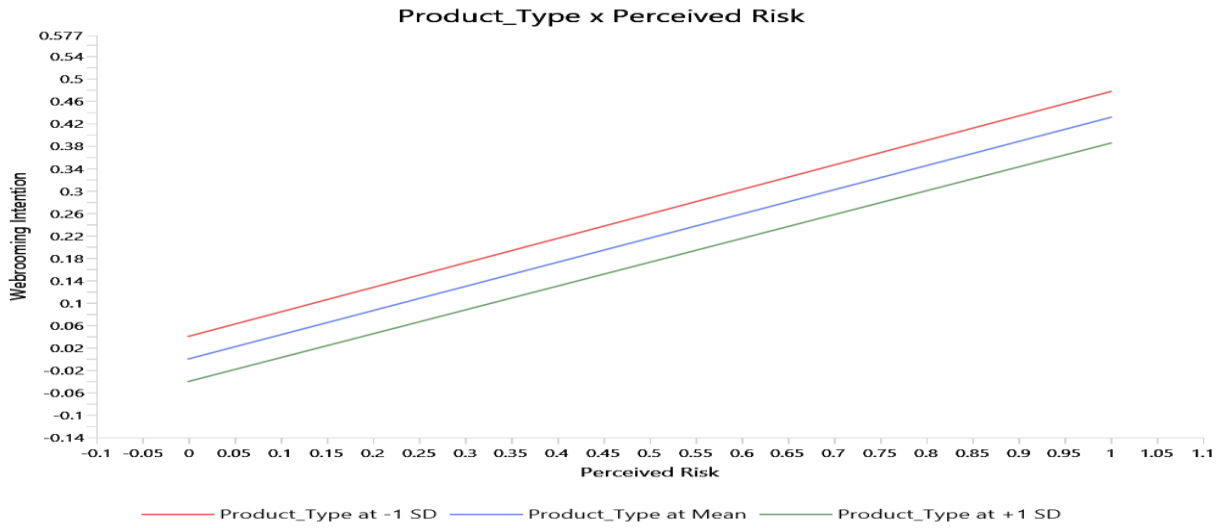

Figure 4: Moderating effect of product type on the relationship between perceived risk and webrooming intention

4.9 Structural Model Explanatory and Predictive Power

Table 9 gives the coefficients of factors R^2, f^2, and Q^2 of the structural model in this study. The PR and WR variance, which the model explains, is 43.3% and 29.9%, respectively, which is a moderate explanatory power of behavioral research (Hair et al., 2021).

Table 9: Model predictive accuracy indicators

R-square		Perceived Risk	Webrooming Intention
		0.433	0.299
f-square	NT	-	0.279
	OT	0.763	0.081
	PR	-	0.150
	PT	-	0.002
	PT x PR	-	0.000
Q-square Predict		0.431	0.187

Concerning the effect sizes, PR and NT have significant effects on WR, and OT has a smaller effect. The rest of the predictors exhibit insignificant effect sizes. Moreover, the values of Q^2 (PR = 0.431) and WR (0.187) are not below zero, which proves the predictive suitability of the model. These findings suggest that the given model has sufficient explanatory and predictive power.

4.10 Analysis of Differences across Countries

Multigroup analysis (PLS-MGA) was used to compare the possible variations in the structural relationships between the three countries (Jordan, Saudi Arabia, and Palestine). According to Table 10, all the pairwise comparisons showed no statistically significant differences in the path coefficients of the three groups ($p > 0.05$).

Table 10: Bootstrap MGA test results

	Path	Diff (JOR - KSA)	p-value	Diff (PAL - KSA)	p-value	Diff (JOR - PAL)	p-value
H. 1	OT to PR	0.000	0.499	0.049	0.150	-0.049	0.839
H. 2	PR to WR	-0.095	0.862	0.016	0.422	-0.111	0.890
H. 3	OT to WR	0.022	0.377	-0.038	0.688	0.060	0.228
H. 4	NT to WR	-0.083	0.921	-0.058	0.847	-0.025	0.650
H. 5	OT to PR to WR	0.064	0.150	0.013	0.417	0.051	0.211
H. 6	PT x PR to WR	0.040	0.288	0.019	0.392	0.022	0.388

These results suggest that the hypothesized links between OT, PR, NT, PT, and WR are consistent and stable across the country contexts that were studied. The lack of large cross-country variations implies that the suggested model has high external validity and can be used consistently across various Arab markets.

5. Discussion

This research aimed at investigating the motivators of WR through the combination of OT, PR, NT, and PT in a single PLS-SEM model. The study shows a rich understanding of the modern omnichannel consumer behavior by addressing both mediating and moderating processes and assessing the model in three Arab countries. The findings affirm that OT is a strong predictor of PR, which makes the opinion that trust is a major uncertainty reducing process in the virtual world. This observation closely correlates with trust-based approaches to e-commerce studies, which hold that trust helps to alleviate consumer fears of opportunism, information asymmetry, and uncertainty of the transactions (Gefen et al., 2003; McKnight et al., 2002). Theoretically, the finding is in line with risk trust models that are based on uncertainty reduction theory,

implying that trust can be viewed as a mental shortcut that enables consumers to navigate intricate online spaces with more confidence. The quality of this relationship in the present study underscores that trust is a pillar construct despite the increased digitization of consumers.

This result is consistent with the risk management view of consumer behavior that posits that consumers are active in modifying their channel decisions to reduce their perceived losses (Featherman & Pavlou, 2003). The outcome is empirically consistent with previous webrooming research that found that uncertainty about online purchases is a stimulus to change channels to offline settings where inspection, reassurance, and immediacy can be found (Arora & Sahney, 2019; Aw, 2020). These observations combined support the notion that webrooming is a strategic coping mechanism as opposed to a contradiction of digital trust.

Theoretically, the result is echoed in channel integration and omnichannel engagement theories, which point out that trust increases the desire of consumers to engage in fluid channel interactions. Instead of restricting the consumers to a single channel, trust seems to enable the latter to integrate online and offline resources in a better way. This understanding builds on the previous studies by placing trust as a protective and enabling factor in the omnichannel settings.

The high positive impact of NT on WR also supports the long-term importance of sensory-oriented motives in retail decision-making. In line with the haptic information processing theory (Peck & Childers, 2003), consumers who have a high desire of tactile information tend to resort to webrooming as a way of counterbalancing the sensory deficiency of online medium. This observation is similar to previous retail research that highlights the importance of tactile preference in attracting consumers to the physical stores despite the availability of a lot of information online. Notably, the finding indicates that technological development has not erased the psychological value of touch, but it has instead changed the way consumers arrange to use the channels.

This observation offers a more advanced insight into the functionality of trust in the realm of omnichannel behavior. Although trust has a direct positive impact on the willingness of consumers to webroom, it also affects this activity changing the perception of risk. This two-way process is in line with the modern theories of digital consumers that view trust as cognitive belief and perceptual filter. By showing that the mediation is partial and not complete, the study shows that trust has an independent role that does not depend on the reduction of the risk, but that is enriched to a more comprehensive account of the webrooming behavior.

However, as opposed to expectations, PT did not moderate the relationship between PR and WR. Nevertheless, to the surprise of the authors, the interaction between PR and WR was not moderated by PT. In terms of theoretical contribution, this outcome contradicts established beliefs based on the search-experience good theory (Nelson, 1970, 1974). Namely, according to this perspective, increased requirements concerning sensory evaluation should make the impact of perceived risk on switching channels even stronger. Possible reasoning underlying this result is linked to the growing amount of information made available online, such as product reviews, customer ratings, images, etc., thus blurring the gap between high-touch and low-touch goods (Chen et al., 2021). It can be concluded that consumers apply similar strategies when making decisions about different products.

In addition, the obtained findings are also consistent with the idea of a change in the behavior of modern consumers using the omnichannel approach, in which perceived risk plays the role of the driver of

webrooming regardless of product features. That is, consumers utilize webrooming as a general strategy aimed at reducing risks associated with purchases. These conclusions correlate with the outcomes of contemporary studies demonstrating that digital experience and standardization of information can weaken traditional product classifications in terms of channel choice (Flavián et al., 2019; Quach et al., 2022).

The result contradicts classical expectations based on the theory of search experience goods (Nelson, 1970), which presupposes that channel switching behavior should be increased by sensory intensity. It is possible that this can be explained by the reason that modern consumers are more digitally literate and are more dependent on standardized online sources of information, which makes the product-based distinction less relevant. Alternatively, PR can also operate as a generalized behavioral driver which cuts across product categories in omnichannel situations.

This cross-country consistency helps to prove the external validity of the model and is consistent with research that shows that digital shopping behaviors are becoming more and more homogenous across regions because of platform standardization and the adoption of mobile commerce. Theoretically, the result supports the idea that the fundamental psychological processes, including trust, risk perception, and sensory needs, work in a similar manner in cultural settings provided that the digital retail infrastructures are similar. By showing consistent cross-country effects and challenging the moderating value of the PT, the results challenge researchers to rethink the conventional wisdom and concentrate on the emerging consumer capabilities in the digital setting.

6. Theoretical Implications

The research paper also adds to the body of literature on omnichannel and webrooming by providing a combined account of the effects of OT, PR, and NT on WR. Having empirically validated the mediating effect of the PR, the results expand the scope of trust risk models to online buying that takes place through one channel and prove their applicability in mixed consumer practices. The findings also narrow down the theory of haptic information processing by demonstrating that the necessity of touch still plays an important role in channel integration and not just channel preference. Further, the non-significant moderating role of PT disputes conventional beliefs based on the search experience goods theory by indicating that PR can serve as a generalized behavioral process in product categories in modern omnichannel settings. Lastly, the lack of cross-country variations enhances the external validity of the model and helps to explain the increasing convergence of the omnichannel consumer behavior in new digital markets.

7. Managerial Implications

As a manager, the findings would imply that the retailers need to consider webrooming as a complementary and value-adding behavior as opposed to channel conflict. PR can be minimized by improving online credibility and trust by providing clear information, safe payment systems, and reliable privacy guarantees, which will also enable proper channel integration. Since PR is highly influential on the intention of webrooming, retailers need to strategically match online information within store experiences by making sure that there is consistency in product descriptions, pricing, and promotional messages. The importance of NT is significant, which explains the importance of facilitating a smooth transition between online search and in-store product inspection, such as by online booking of an appointment, product availability, or in-store experience areas. Because the type of product did not moderate risk impacts, managers ought to

implement risk mitigation strategies across product lines instead of confining them to the high-touch products, especially in the digitally advanced markets.

8. Future Direction and Limitations

Even though the current study makes an important contribution towards an understanding of webrooming behavior, there exist several limitations associated with it, thus providing ideas for further studies. First of all, the current research uses a non-probability convenient sample selection within stratified samples, which may affect the extent of applicability of its findings. Even though the researchers stratify the samples according to the type of country and key demographics, the use of online surveys makes random sample selection difficult. It is necessary to use other sampling methods to increase the representativeness and validity of results.

Secondly, being a cross-sectional study, the current study cannot make conclusions regarding possible causal associations between studied constructs. Future research would have to use other study designs in order to address the issue. Thirdly, PR was identified as a higher-order construct. Future research can be conducted to analyze the effect of different dimensions of this variable. Fourthly, even though cross-country differences were not found in the current study, future studies can explore this aspect to gain a deeper insight into boundary conditions of the proposed theory.

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