The effect of perceived scarcity on impulse-buying tendencies in a fast fashion context: A mediating and multigroup analysis

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Abstract

Purpose – This study investigates the relationships between perceived scarcity, fear of missing out (FOMO) and impulse-buying tendencies (IBT) in the fast fashion context in both scarcity and non-scarcity conditions. Additionally, this study examines whether these relationships vary depending on the type of scarcity messages: limited-quantity scarcity (LQS) and limited-time scarcity (LTS).

Design/methodology/approach – We used written scenarios, and each participant was assigned to one of the experimental or control groups for LQS and LTS conditions. Using a structural modeling approach, we tested the conceptual model and analyzed the data through SmartPLS version 4. We conducted mediating and multigroup (MGA) analysis.

Findings – We found that perceived scarcity directly increases IBT and that FOMO partially mediates this relationship across all samples. The MGA findings also revealed that hypothesized relationships were not significantly different across LQS and LTS groups, suggesting that the effect of scarcity messages may be context specific.

Originality/value – Previous studies have yielded mixed results on the effects of different scarcity messages on consumer behavior. This study contributes to the literature by providing evidence of the direct relationship between perceived scarcity, FOMO and impulse buying in the fast fashion context. The study supports the idea that the effect of different types of scarcity messages is context specific, suggesting that the relationship between scarcity perceptions and consumer behavior may vary depending on the product category and cultural context.

Keywords Perceived scarcity, Fear of missing out, Impulse-buying tendencies, Fast fashion, Product scarcity

Paper type Research paper

1. Introduction

Fast fashion products can meet customer expectations at low prices and reach a wide range of consumers. This has contributed to the rapid growth of brands operating in the fast fashion industry. In fact, since the emergence of fast fashion in the early 2000s, brands have significantly expanded their collections, producing nearly double that of pre-2000 levels (Niinimäki et al., 2020). Trends in the global fashion industry change rapidly depending on the pace of sales growth and market size. Fast fashion has emerged as a widely adopted approach among retailers within the industry, reaching a market worth over $106 billion in 2022 Statista, 2023. Accordingly, retailers adopt dynamic marketing and advertising strategies distinct from the traditional fashion industry. The use of scarcity messages is a prominent strategy employed in this regard.

Many fast fashion brands strategically offer a limited number of clothing and accessory releases for a limited time (Barnes and Lea-Greenwood, 2010), encouraging consumers to make impulse purchases (Ferdows et al., 2003). These perceptions of scarcity created by brands can create purchasing pressure on consumers and lead them to unplanned purchasing behaviors. Fast fashion brands use scarcity in two ways: limited-quantity scarcity (LQS) and limited-time scarcity (LTS). In the LTS condition, an offer is valid for a certain period, after which the offer expires (e.g. "Sales prices valid until Friday"). Similarly, in the LQS condition, the offer is valid for a limited number of products. The degree of scarcity is increased by reducing the number of available items (e.g. "Only 100 were produced"). In both conditions, the goal is to get consumers to see the offer as an opportunity. However, LQS may increase due to changes in supply or demand, while LTS is mainly controlled from the supply side (Gierl et al., 2008). LQS, which retailers often use to increase the appeal of a product, can encourage consumers to compete to purchase scarce items. Because scarcity is a strong marketing strategy that encourages consumers to compete, consumers shape their decisions according to the emerging competitive situation (Nichols, 2012). A classic example of this is the label "produced in limited numbers," which is used to indicate that the product may not be produced again after it is sold out.

Fear of missing out (FOMO) is a psychological phenomenon that has long attracted researchers from various disciplines. FOMO refers to the fear or anxiety of missing enjoyable experiences, social connections or opportunities others may have (Przybylski et al., 2013). FOMO plays a significant role in using scarcity messages in fast fashion (Hodkinson, 2016). Retailers use these messages to present their products as exclusive opportunities that should not be missed, aiming to prompt quick purchasing decisions because fast fashion focuses on high-volume production rather than catering to individual needs (Gupta and Gentry, 2016). While the scarcity of luxury products can create a sense of prestige and status, scarcity in fast fashion is often created through marketing strategies, such as limited-time promotions or artificial stock shortages, rather than inherent exclusivity. Furthermore, scarcity in fast fashion is mainly driven by trends and constant turnover. Fast fashion brands design and produce garments with a short lifespan, aiming to quickly replace them with new styles to stimulate constant consumer demand. This strategy creates a sense of scarcity by promoting the idea that products are limited and may not be available for long (Byun and Sternquist, 2011).

While FOMO can motivate consumers to stay informed, explore new products and engage in social activities, it can also have negative consequences. For instance, it may contribute to impulsive buying behavior (Zhang et al., 2022). However, no study has yet investigated the relative effect of different scarcity messages on impulse-buying tendencies (IBT), considering the mediating role of FOMO. Accordingly, this study aims to contribute to the literature by filling this research gap and empirically testing previously unexplored relationships in the context of fast fashion. The present study seeks to provide comparative empirical evidence through the proposed research model and contribute to the existing body of knowledge. More specifically,

this study analyzes the moderating role of types of scarcity messages (LTS and LQS) on the hypothesized relationships within the fast fashion context. Taken together, a better understanding of these relationships can assist fast-fashion retailers in enhancing the persuasiveness of their promotional efforts while also drawing attention to the potential negative consequences associated with leveraging FOMO and scarcity perceptions.

2. Literature review
In the last few decades, research on the effects of scarcity messages on consumer behavior has gradually attracted more attention from researchers in various disciplines. These studies can be classified into two groups: (1) studies examining the effect of product scarcity on general consumer behavior and how consumers perceive a scarce product and (2) studies examining the relationship between product scarcity and psychological structures used in consumer research.

Chronologically, older studies in the first group primarily focused on explaining how consumers perceive product scarcity. Some of these studies showed that scarce products are associated with higher prices (Lynn, 1989; 1992; Solomon and Rabolt, 2009) and are perceived as more valuable or attractive (appealing) by consumers (Aggarwal *et al.*, 2011; Brock, 1968; Brock and Brannon, 1992; Byun and Sternquist, 2008; Byun and Sternquist, 2011; Lynn, 1991; Mittone and Savadori, 2009; Szybillo, 1975; Tan and Chua, 2004; Verhallen and Robben, 1994). These preliminary studies concluded that perceived scarcity (PS) positively affected product evaluation (Lee *et al.*, 2015).

In the second group, more recent studies (e.g. Aksoy and Palma, 2019; Biraglia *et al.*, 2021; Guo *et al.*, 2017; Gupta and Gentry, 2016; Wu *et al.*, 2011) have examined the relationship between perceived product scarcity and other psychological constructs commonly used in consumer research (Aggarwal and Vaidyanathan, 2003; Jang *et al.*, 2015; Lee *et al.*, 2015). These studies, which mostly focused on fashion products, have revealed varied results on the types of scarcity messages and their effects on consumption-related constructs. For example, Aggarwal *et al.* (2011) examined the relative effect of LTS and LQS messages on purchase intentions, using brand concept as a mediator. Their results showed that limited-quantity messages were more effective than limited-time messages in influencing consumers' purchase intentions toward a luxury watch brand, Swatch. Lee *et al.* (2015) adopted the same approach but focused on impulse buying, revealing that the relative effects of different scarcity messages vary culturally. They found that Chinese consumers' IBT toward jeans were more likely than Korean consumers' to be impacted by LTS messages than LQS messages. Wu *et al.* (2011) found that arousal mediated the relationship between two types of scarcity messages and impulse buying of handbags.

Some recent studies focusing on products other than fashion have pointed out FOMO that can potentially influence the impact of scarcity messages on consumer behavior. For instance, Zhang *et al.* (2020) found that FOMO mediates the relationship between PS and willingness to pay. Similarly, a study conducted by Zhang *et al.* (2022) on medical equipment found that the bandwagon effect moderates the impact of scarcity perception on impulse buying, while FOMO plays a mediating role. In addition, studies comparing the effects of scarcity messages on different product categories also support the effects of scarcity messages can vary depending on the type of scarcity (limited time or limited quantity) and the context in which they are presented (e.g. Gierl *et al.*, 2008; Gierl and Huettl, 2010).

Previous studies have indicated that the effects of scarcity messages on consumer behavior can vary based on the retail environment and the stages of the consumer decision-making process. While most studies examining the scarcity effect in an offline context demonstrate a positive impact on consumer behavior, some studies conducted in an online context have found that this effect is not significant (Noone and Lin, 2020) or contingent on certain conditions

(Kim *et al.*, 2020). However, no study has yet investigated the effect of scarcity messages on consumer behavior in a single comparative study. Finally, in the classical consumer decision-making process, the consumer makes a purchase decision after searching for information and evaluating alternatives (Engel *et al.*, 1968). However, previous studies indicate that scarcity messages lead consumers to skip some of the decision-making steps (Lee *et al.*, 2015). When the research results are evaluated together, the inconsistency in the results indicates that the relationships between variables may be context, product and culture-specific.

2.1 Theoretical framework and hypotheses

Previous studies have explained the scarcity principle primarily through commodity theory (Brock, 1968; Lynn, 1991). According to this theory, the value of a good or service depends on how easily it may be obtained. If a product is perceived or offered as scarce, consumers will fear missing out on the opportunity to own it. On the other hand, psychological reactance theory assumes that an individual whose right to choose is restricted will want to do the restricted to regain freedom of choice (Brehm and Brehm, 1981; Clee and Wicklund, 1980; Wicklund, 1974). Both theories contribute to an empirically based understanding of the relationship between PS and FOMO. Przybylski *et al.* (2013: p. 1842) noted that "individuals who are low in basic need satisfaction may gravitate toward things or activities perceived as a resource to get in touch with others and a tool to develop social competence." Accordingly, if a product (opportunity) is scarce in quantity or time, consumers may interpret it as a means of superiority or competition (Henkel *et al.*, 2022). The perception of scarcity created by brands can cause consumers to lose control over products and act more competitively to own products (Gupta and Gentry, 2016). However, this type of competition is weaker in a limited time condition because consumers only compete against time, not against each other (Kristofferson *et al.*, 2016). Consumers who wish to obtain the promoted product can do so as long as they meet the designated time frame. Accordingly, we hypothesize that:

> *H1.* PS positively influences FOMO for (a) the pooled sample, (b) the scarcity group and (c) the no-scarcity group; furthermore, (d) the strength of the positive effect of PS on FOMO will be stronger among the scarcity group compared to the no-scarcity group and (e) the LQS group compared to the LTS group.

Previous studies indicate that PS increases the perceived value of products and services (Bhaduri and Stanforth, 2016; Gierl and Huettl, 2010; Lynn, 1991; Wu *et al.*, 2011). As the probability of purchasing a product decreases, its value increases (Byun and Sternquist, 2011). When consumers perceive products with scarcity messages as more valuable, they may be more motivated to purchase the product and then feel stronger emotions once they own it (Brehm and Brehm, 1981) because arousal levels are raised when goods are believed to be limited (Zhu and Ratner, 2015). Aware of this effect, retailers offer various opportunities to consumers with scarcity messages. These messages strengthen consumers' emotional bonds with products in the shopping environment (Lynn, 1992; Wu and Hsing, 2006). Scarce products, seen as high quality and prestigious by consumers, can lead them to impulse-buying behavior based on the emotional stimulation they provoke (Rook and Gardner, 1993; Silvera *et al.*, 2008; Vernplanken and Sato, 2011; Wu *et al.*, 2011; Zhang *et al.*, 2020). Therefore, scarcity messages can motivate consumers to buy products more quickly and without planning (Aggarwal *et al.*, 2011; Chung *et al.*, 2017). This can even lead to consumer panic buying behavior (Cham, *et al.*, 2022; Tan *et al.*, 2021). In addition, consumers exposed to scarcity messages may not research alternative products when faced with limitations of time and quantity. Because they cause arousal and suppress consumers' propensity for elaborate alternatives, scarcity campaigns encourage automatic, thoughtless responses (Cialdini, 2008). The pressure that accompanies scarcity messages can accelerate purchasing decisions.

To the best of our knowledge, there is no research that has examined the impact of various types of scarcity messages on impulse-buying behavior. However, in a recent study, Islam *et al.* (2021) found a positive relationship between both types of scarcity (LQS and LTS) and perceived arousal. Bandyopadhyay *et al.* (2021) conducted a study in which they classified consumer promotion techniques into four categories and investigated which ones led to impulse buying. They discovered that only two of the categories were associated with impulse buying, supporting the effect of PS on impulsive buying may differ by different scarcity messages.

H2. PS positively influences IBT for (a) the pooled sample, (b) the scarcity group and (c) the no-scarcity group; furthermore, (d) the strength of the positive effect of PS on IBT will be stronger among the scarcity group compared to the no-scarcity group and (e) the LQS group compared to the LTS group.

FOMO in the consumption context is the state of anxiety or fear of not having something owned, bought or experienced by others (Gupta and Gentry, 2016; Franchina *et al.*, 2018; Przybylski *et al.*, 2013). FOMO on a product available to a limited number of people and being deprived of its associated physical and emotional benefits can lead consumers to compete for that product. Correspondingly, FOMO may encourage purchasing by exerting pressure on consumers' decisions, resulting in impulse-buying behavior (Hodkinson, 2016). Individuals who feel FOMO engage in impulse-buying behavior because of the emotional interaction arising from FOMO. Similarly, previous studies have found a relationship between FOMO and sensation seeking (Wang *et al.*, 2019) and hedonic needs (Kang *et al.*, 2020). FOMO's hedonistic aspect can be effective in driving consumers to make unplanned purchases, and they may show a tendency toward impulsive buying behavior, as suggested by the literature (Alavijeh and Golestani, 2022; Guo *et al.*, 2017; Song *et al.*, 2015; Li *et al.*, 2021). FOMO has been linked to the need for popularity (Beyens *et al.*, 2016), potentially causing consumers to make impulse purchases in the fashion industry (Cengiz, 2017). Accordingly, we predict that FOMO will positively impact impulsive buying tendencies.

H3. FOMO positively influences IBT for (a) the pooled sample, (b) the scarcity group and (c) the no-scarcity group; furthermore, (d) the strength of the positive effect of FOMO on IBT will be stronger among scarcity group compared to no-scarcity group and (e) the LQS group compared to the LTS group.

Personality motivates impulse-buying behavior (Tan *et al.*, 2022). Reagle (2015) defines FOMO as a personality trait and envy-related anxiety resulting from comparing oneself to others. Individuals who feel FOMO compare themselves to peer groups or individuals within their social group. Correspondingly, owning scarce goods may cause one to feel highly respected and envious of oneself. Scarce products serve as tools consumers use to emphasize their uniqueness when comparing themselves to others (Gierl and Huettl, 2010). Individuals who feel FOMO fear missing an opportunity, being deprived and shape their behavior with this state of anxiety (Przybylski *et al.*, 2013; Reagle, 2015). They may consider suppressing these fears by purchasing scarce products. Therefore, they may be more motivated when purchasing scarce products, which may lead to impulse purchases.

FOMO is an externally initiated response mechanism rather than a self-initiated personality trait (Hodkinson, 2016). Accordingly, scarcity messages function as external stimuli calling consumers to take action and avoid missing an opportunity. PS, or the uniqueness of an opportunity, may increase the effectiveness of missing-out appeals. FOMO appeals are a "call to action" because they are intended to inspire customers to take advantage of a specific opportunity (Hodkinson, 2016: p. 13). As noted by previous

research, we predict that scarcity messages will positively influence consumers' arousal, leading them to impulse purchases (Guo *et al.*, 2017).

H4. FOMO partially mediates the relationship between PS and IBT for (a) the pooled sample, (b) the scarcity group and (c) the no-scarcity group; furthermore, this mediation is stronger among (d) the scarcity group compared to the no-scarcity group and (e) the LQS group compared to the LTS group.

All hypothesized relationships are shown in Figure 1. As shown in the figure, a partially mediated model includes an additional direct path from the PS to the impulsive buying tendency. This model suggests that in addition to the mediation of FOMO, PS directly affects impulsive buying.

3. Methodology

3.1 Sample and data collection procedure

In line with the approach adopted by similar studies in the literature (Wu *et al.*, 2011; Gabler and Reynolds, 2013; Lee *et al.*, 2015), we used written scenarios to manipulate scarcity. In the scenarios, respondents were asked to imagine they went to a fast fashion store with sufficient funds and indicate their agreement levels to the statements, after which they read manipulation sentences about a product they liked (see Supplementary Materials for Scenarios). In scarcity conditions, respondents read messages related to either LQS or LTS. Respondents in the LQS experimental group were informed that this product is a limited edition and supplies are only limited to 20, while respondents in the LQS control group were informed that there were "abundantly available and sufficient items in stock." Respondents in LTS experimental group were informed that they would get a 30 per cent discount "only today"; respondents in the LTS control group informed that they would get a 30 per cent discount. Some studies have conveyed demand-induced
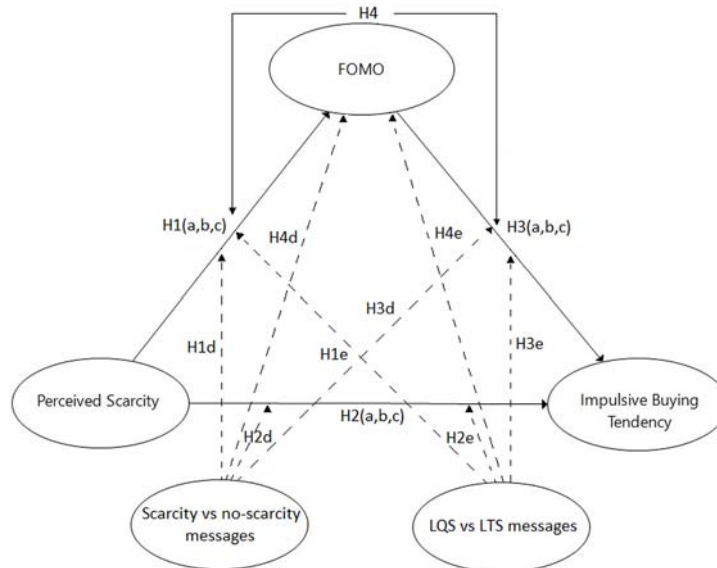

Figure 1.
Theoretical research model

Source: Figure created by the authors

scarcity through sentences such as "we have only two left" (Gabler and Reynolds, 2013). However, we wanted to evoke that scarcity was caused by supply rather than demand. Following the recommendations of Lee *et al.* (2015) and Gabler and Reynolds (2013), we kept the discount rate steady at 30 per cent to minimize its effect on IBT (Lee *et al.*, 2015).

We obtained data from 753 undergraduate students at a university through an online survey, with each student assigned to one of the experimental or control groups for LQS and LTS conditions. Participants were randomly placed in the LQS groups (experimental group, $n = 271$; control group, $n = 136$) and LTS groups (experimental group, $n = 230$; control group, $n = 116$). A pool-testing approach was used, where samples were amalgamated into a group and tested as if they were a single sample. This resulted in two main data groups: scarcity and non-scarcity groups. The scarcity group consisted of experimental group data, while the non-scarcity group consisted of control group data. A student sample was intentionally chosen for this study. College students readily embrace fast fashion items due to their constrained financial means and the significance of donning fashionable and socially noticeable fast fashion garments for socializing during this phase of their lives (Park and Sullivan, 2009).

All students received extra credit toward course grades in return for participation. The demographic profile of respondents is shown in Table I.

3.2 Manipulation check
We used the PS scale (Wu *et al.* 2011) to assess manipulation effectiveness. Results of *t*-tests revealed that the average mean scores for PS for the experimental group (M_{scarcity} [LQS + LTS] = 4.01, SD = 0.89) was significantly higher than those for the control group ($M_{\text{no-scarcity}}$ = 1.80, SD = 0.95, F(1.173) = 17.357, $p < 0.001$). These results showed that scarcity manipulation was successful.

3.3 Measurements
We employed previously validated scales to measure the hypothesized relationships shown in the research model. PS was measured using a five-item scale developed by Wu *et al.* (2011), while FOMO was measured using a 10-item scale developed by Przybylski *et al.* (2013). We measured IBT with a nine-item scale adapted from Rook and Fisher (1995). All items were measured on a five-point Likert scale (see Supplementary Table I for scale items – Source: Table created by Author). In the last section, we asked questions to establish a demographic profile of respondents.

| | | Sample groups | | | |
| | | Scarcity condition ($n = 501$) | | No-scarcity condition | |
		LQS ($n = 271$)	LTS ($n = 230$)	($n = 252$)	Total ($n = 753$)
Gender	Female	146	127	164	437
	Male	125	103	88	316
Age	18–24	236	169	229	634
	25+	35	65	19	119
Income (₺/month)	0–2,999	83	62	83	228
	3,000–6,999	114	90	112	316
	7,000 +	74	78	57	209
Source: Table created by the authors					

Table I.
Demographic profile of
respondents

3.4 Two moderating variables: absence/presence of scarcity messages and limited-time/limited-quantity scarcity messages

This study considers the scarcity conditions (scarcity versus no-scarcity) and the type of scarcity messages (LQS and LTS) as categorical moderator variables.

3.5 Common method bias

In this study, we took precautions recommended by Podsakoff *et al.* (2012) and Tehseen *et al.*, (2017) to minimize potential common method bias. We examined the common method variance in the data before testing the hypothesized relationships. For example, we used clear and concise language, avoided double-barreled questions, checked the scale items before data collection and revised accordingly. Because there is no consensus among scholars regarding the best method to detect common method variance, we followed various procedures, such as the correlational marker technique, also known as MV-marker variable analysis (Lindell and Whitney, 2001); Harman's one-factor test (Podsakoff and Organ, 1986) and correlation technique (Podsakoff and Organ, 1986; Schaller *et al.*, 2014). First, we added one marker item, theoretically unrelated to the others, to the survey: "Clothing is an important part of my life." Analysis results showed that the mean correlation coefficient value for the marker item was 0.041, which is lower than 0.05, indicating an insignificant influence of the common method variance (Rönkkö and Ylitalo, 2011). Second, we applied Harman's one-factor test to detect common method variance. Results indicated that the covariance was 35.25 per cent for the pooled sample, 40.11 per cent for the scarcity group and 29.83 per cent for the no-scarcity group. The total variance explained by one factor was below the threshold of 50 per cent (Podsakoff and Organ, 1986). Third, we assessed the correlation matrix shown in Table III to determine whether high correlations existed among the constructs. Table III shows that the highest correlation was 0.61, falling far below the cutoff value of 0.90. All these procedures indicate the absence of common method bias in this study.

4. Results

4.1 Data analysis

Partial least squares is a powerful and suitable statistical method (Henseler *et al.*, 2009) for testing complex relationships in a research model, such as mediation, moderation and multigroup analysis (MGA) (Hair *et al.*, 2018). In this study, we used SmartPLS version 3.2.7 (Ringle *et al.*, 2015) to conduct mediation and MGA. The data are pooled in the analysis section to examine the reliability and validity of the constructs using a larger, more heterogeneous sample. The scarcity group consists of a mix of both LQS and LTS, while the pooled sample includes data from all four groups.

4.2 Measurement model evaluation

As shown in Figure 1, all constructs in this research were first-order reflective. We assessed the measurement quality by examining convergent validity, discriminant validity and internal consistency. We used item loadings, composite reliabilities (CR) and average variance extracted (AVE) values to assess the convergence validity and reliability of the constructs (Hair *et al.*, 2018). We removed one item from the FOMO construct and one item from the IBT construct because they loaded on their respective construct at lower than 0.6, both in the pooled and LQS and LTS samples. Their removal increased the AVE and CR values of the constructs in all samples. Table II shows that all CR values across the three models exceeded the threshold value of 0.70, indicating that our constructs were reliable. To assess convergent validity, we checked each construct's AVE values and outer loadings in the three models. Table III shows that AVE values ranged from 0.504 to 0.735. Table II

Items	Pooled sample			Scarcity sample			No-scarcity sample		
	Outer loading	CR	AVE	Outer loading	CR	AVE	Outer loading	CR	AVE
FOMO1	0.71	0.90	0.507	0.72	0.90	0.504	0.80	0.90	0.527
FOMO2	0.68			0.70			0.83		
FOMO3	0.68			0.67			0.65		
FOMO4	0.71			0.70			0.72		
FOMO5	0.75			0.79			0.70		
FOMO6	0.76			0.75			0.73		
FOMO7	0.71			0.68			0.68		
FOMO8	0.73			0.73			0.69		
FOMO10	0.69			0.64			0.73		
IBT1	0.75	0.94	0.566	0.74	0.91	0.578	0.75	0.90	0.531
IBT2	0.82			0.84			0.79		
IBT3	0.83			0.84			0.80		
IBT4	0.77			0.80			0.68		
IBT5	0.72			0.68			0.78		
IBT7	0.76			0.78			0.72		
IBT8	0.71			0.73			0.67		
IBT9	0.67			0.67			0.62		
PS1	0.84	0.93	0.735	0.77	0.90	0.657	0.81	0.91	0.693
PS2	0.86			0.82			0.82		
PS3	0.82			0.78			0.81		
PS4	0.87			0.83			0.86		
PS5	0.87			0.82			0.85		

Notes: CR = composite reliability; AVE = average variance explained
Source: Table created by the authors

Table II.
Item loadings,
construct reliability
across groups

reveals that the three models' remaining outer loadings were above 0.6 (Hair *et al.*, 2018). The results of internal consistency, along with manipulation control results, are central measures to test the validity of scenarios. In addition to the manipulation check results, internal consistency results support the validity of the scenarios for both groups.

We used two types of criteria for assessing the discriminant validity: the Fornell & Larcker and Heterotrait–Monotrait (HTMT) approaches. First, we checked whether the square roots of the AVE values were above the correlations between each pair of constructs (Fornell and Larcker, 1981) (see Table II). We then examined the HTMT ratio and found that HTMT indexes fell below the threshold level of 0.90 (Henseler *et al.*, 2016). Table III shows that all constructs achieved discriminant validity in the three samples.

Table IV shows R^2 values, which illustrate the fluctuation in the endogenous variable as explained by the exogenous variable(s). Following Falk and Miller's (1992) recommendation that R^2 values should be equal to or greater than 0.10, we can conclude that our model achieved acceptable explanatory power. To further validate the research model, we checked standardized root mean square residual (SRMR) values for pooled, scarcity and no-scarcity groups. Results showed SRMR values of 0.061, 0.068, and 0.063, respectively. This indicated an appropriate fit, assuming the recommended cutoff of 0.080 (Hu and Bentler, 1999). In addition to the size of R^2, we used the predictive sample reuse technique (Q^2), which can serve as a criterion for predictive relevance (Stone, 1974; Geisser, 1975). Results show that Q^2 values of endogenous latent variables for each sample are larger than zero, which indicates that our model effectively predicts FOMO and IBT.

	Fornell Larcker criteria			HTMT criteria		
	FOMO	PS	IBT	FOMO	PS	IBT
Pooled sample						
FOMO	*0.712*			–		
PS	0.421	*0.857*		0.465	–	
IBT	0.415	0.501	*0.753*	0.468	0.556	–
Scarcity sample						
FOMO	*0.710*			–		
PS	0.403	*0.810*		0.451	–	
IBT	0.489	0.613	*0.760*	0.544	0.693	–
No-scarcity sample						
FOMO	*0.726*			–		
PS	0.391	*0.833*		0.429		
IBT	0.231	0.317	*0.729*	0.252	0.351	–

Table III.
Correlation matrix and discriminant validity

Notes: Italic values on the diagonal are the square roots of the AVE; AVE values are along the main diagonal
Source: Table created by the authors

	R^2	Q^2
Pooled sample		
FOMO	0.177	0.087
IBT	0.301	0.168
Scarcity group		
FOMO	0.163	0.078
IBT	0.445	0.253
No-scarcity group		
FOMO	0.153	0.074
IBT	0.114	0.047

Table IV.
R^2 values

Source: Table created by the authors

4.3 Structural model evaluation

Table V shows the results of the structural model on each sample. These results reveal that all path coefficients were significant except one, indicating that the mediator role of FOMO on the relationship between PS and IBT was not significant; thus, H4e was rejected. All other relationships were significant and in line with our predictions.

4.4 Assessment of measurement invariance

Before conducting an MGA, we examined measurement invariance using a procedure for measurement invariance of composite models (MICOM). This three-step procedure is necessary to determine whether construct measurements are similarly understood across the groups (Henseler *et al.*, 2016). In Steps 1 and 2, we assessed configural and compositional invariance. In Step 3, we checked the composites' equality of mean values and variances across groups. Since we ensured the setup of the measurement models and the structural model for both groups, we can conclude that configural invariance has been established. Table VI and Table VII show the results of the MICOM's second and third steps. With values of 0.997 and 0.995, respectively, PS has the lowest *C* value of all composites for both groups. We can therefore conclude that compositional invariance has been established. Table VI shows that the mean value of composites (Step 3a) for the scarcity and no-scarcity

Sample	Relationship	Standard beta	Standard error	t-value	f^2	Hypothesis supported?
Pooled	PS → FOMO	0.421	0.032	13.211**	0.215	H1a Supported
	FOMO → IBT	0.248	0.037	6.736**	0.073	H1b Supported
	PS → IBT	0.396	0.041	9.686**	0.185	H1c Supported
	PS → FOMO → IBT	0.104	0.019	5.624**	0.104	H1d Supported
Scarcity	PS → FOMO	0.403	0.034	11.795**	0.194	H2a Supported
	FOMO → IBT	0.289	0.039	7.303**	0.126	H2b Supported
	PS → IBT	0.496	0.037	13.301**	0.371	H2c Supported
	PS → FOMO → IBT	0.117	0.020	5.742**	0.117	H2d Supported
No-scarcity	FOMO → IBT	0.126	0.075	1.686*	0.015	H3a Supported
	PS → FOMO	0.391	0.061	6.368**	0.180	H3b Supported
	PS → IBT	0.268	0.083	3.249**	0.069	H3c Supported
	PS → FOMO IBT	0.049	0.031	1.588 n.s.	0.049	H3d Not Supported

Notes: *$p < 0.05$. **$p < 0.01$ n.s. = non-significant
Source: Table created by the authors

Compositional invariance (step 2) Constructs	C value (=1)	95% confidence interval	Compositional invariance?
PS	0.997	(0.996; 0.998)	Yes
FOMO	1.000	(0.999; 1.000)	Yes
IBT	0.999	(0.999; 0.998)	Yes
Composite (Step 3a)	Difference of the composite's mean value		Equal mean values?
PS	−0.369	(−0.130; 0.121)	No
FOMO	1.140	(−0.136; 0.129)	No
IBT	0.293	(−0.129; 0.125)	No
Composite (Step 3b)	Difference of the composite's variances ratio		Equal variances?
PS	−0.024	(−0.203; 0.208)	Yes
FOMO	−0.094	(−0.164; 0.173)	Yes
IBT	0.085	(−0.192; 0.183)	Yes

Source: Table created by the authors

groups, along with variances of composites for the LQS and LTS groups did not significantly differ. Accordingly, partial measurement invariance is established in the study such that we can compare the path coefficients using MGA (Hair *et al.*, 2018).

4.5 Multigroup analysis results
Table VIII shows significant differences between the scarcity and no-scarcity groups. The effect of PS and FOMO on IBT significantly differed in these two groups (supporting H2d and H3d), showing up stronger in the scarcity than the no-scarcity group (supporting H2e and H3e). The positive indirect effect of PS on IBT via FOMO significantly differed in both groups (supporting H4d) and was stronger in the scarcity than in the no-scarcity group (supporting H4e). However, the effect of PS on FOMO was not significantly different across groups; thus, H1d was not supported. Furthermore, the significance of the differences was confirmed by Henseler's MGA test across the two samples.

| Compositional invariance (step 2) | | | |
Constructs	C value (=1)	95% confidence interval	Compositional invariance?
PS	0.995	(0.997; 0.994)	Yes
FOMO	1.000	(0.999; 1.000)	Yes
IBT	0.999	(0.999; 0.998)	Yes
Composite (Step 3a)	Difference of the composite's mean value		Equal mean values?
PS	0.374	(−0.203; 0.208)	No
FOMO	0.330	(−0.164; 0.173)	No
IBT	0.082	(−0.192; 0.183)	Yes
Composite (Step 3b)	Difference of the composite's variances ratio		Equal variances?
PS	0.374	(−0.130; 0.121)	No
FOMO	0.322	(−0.136; 0.129)	No
IBT	0.275	(−0.129; 0.125)	No
Source: Table created by the authors			

Table VII.
MICOM results
(limited time/limited
quantity, H1e, H2e,
H3e and H4e)

5. Discussion

The results of the present study show that PS significantly and positively affects FOMO and IBT. As the degree of scarcity perceived by consumers increases, their IBT also increases. In this study, we tested whether the relationships in the research model varied between scarcity and no-scarcity and LQS and LTS groups. The results revealed that the hypothesized relationships differed significantly between the scarcity vs. no-scarcity groups, except for the effect of PS on FOMO. Regardless of whether the participants were exposed to the scarcity scenario, we observed that PS positively affected their FOMO. This result, which can be considered an important contribution to the literature, can be associated with FOMO being more of a personality trait (Przybylski et al., 2013). As discussed in the literature review, these findings are in line with previous research results (Eisend, 2008; Fritchie and Johnson, 2003; Gabler and Reynolds, 2013; Lee et al., 2015; Zheng et al., 2013) and the foundation of commodity theory, which is the theoretical basis on which these studies generally rely (e.g. Lynn, 1989; Verhallen and Robben, 1994; Eisend, 2008). However, unlike previous studies, including FOMO in the research model and confirming its mediating role in this relationship allow for discussing the results in the context of other relevant theories. For instance, our findings support that the limited availability of a product or opportunity may create a perception of exclusivity and uniqueness, allowing consumers to fulfill their need for autonomy and competence. Accordingly, we find evidence that FOMO may intensify these feelings and drive individuals to engage in impulse buying to maintain their sense of autonomy and competence. This aligns with another theoretical approach, self-determination theory (Deci and Ryan, 1985).

Previous research indicates that social influence may also contribute to impulse buying (Chan et al., 2017). The social comparison theory (Festinger, 1954) proposes that individuals determine their worth and evaluate themselves based on social comparisons. FOMO arises when individuals perceive that others are enjoying desirable experiences or possessions that they themselves lack (Przybylski et al., 2013). Research findings support that FOMO could motivate individuals to engage in behaviors that help them avoid missing out and maintain social status. The mediating role of FOMO indicates that consumers who experienced FOMO were more likely to engage in impulsive buying to avoid the fear of being left behind and to maintain their social standing.

One of our most important findings is that no relationships in the research model differed significantly between the LQS and LTS groups. This result contradicts the results of previous studies (Aggarwal et al., 2011; Inman et al., 1997; Song et al., 2021; Lee et al., 2015). Prior studies found that consumers perceive products as more valuable under the LQS condition than in the

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	Path coefficient (scarcity)	Path coefficient (no-scarcity)	Difference	t-parametric	Henseler p-value	Hypothesis support?
Scarcity–no-scarcity groups						
Direct effects						
PS → FOMO	0.403	0.391	0.012	0.190	0.433	H1e not supported
PS → IBT	0.496	0.268	0.228*	2.908	0.005	H2e, Supported
FOMO → IBT	0.289	0.126	0.163*	2.184	0.021	H3e, Supported
Mediation effect						
PS → FOMO → IBT	0.117	0.049	0.067*	1.904	0.032	H4e, Supported
LQS–LTS groups						
Direct effects						
FOMO → IBT	0.286	0.325	−0.040	0.508		H1f not supported
PS → FOMO	0.423	0.343	0.081	1.184	0.302	H2f not supported
PS → IBT	0.534	0.450	0.084	1.166	0.120	H3f not supported
Mediation effect						
PS → FOMO → IBT	0.121	0.111	0.009	0.238	0.406	H4f not supported

Note: *Significant at $p < 0.05$.
Source: Table created by the authors

Table VIII.
MGA test results.
Hypothesis testing of
H1e to H4e

LTS condition due to the affordability inference (Aggarwal *et al.*, 2011; Inman *et al.* 1997). Similarly, Jang *et al.* (2015) found that LTS and LQS messages affect consumers' brand evaluations differently. In a more recent study, Song *et al.* (2021) found that consumers' purchase intention was higher in the LQS condition in a tourism context. These results support that the impact of different scarcity messages on purchase behavior varies (e.g. Aggarwal *et al.*, 2011; Lynn, 1992; Wu *et al.*, 2011). Contrary to previous findings, this study shows that consumers focus on *the existence of the scarcity message* rather than *the type of scarcity message* in the context of fast fashion. This could be related to the fact that this study was conducted in a fast fashion context; the research variables used were context-specific constructs (for FOMO, see, e.g. Good and Hyman, 2020; for impulse buying, see, e.g. Styvén *et al.*, 2017; for PS, see, e.g. Barton *et al.*, 2022). The theory of psychological reactance can support this finding. According to this theory, individuals naturally tend to assert their freedom and autonomy (Brehm and Brehm, 1981). When consumers perceive scarcity messages, regardless of the type, they may feel a sense of restriction or loss of choice. Consequently, they respond by exhibiting higher motivation to obtain the product, regardless of whether it is LQS or LTS. Furthermore, the theory of heuristic processing, also known as the Elaboration Likelihood Model, can support this finding (Petty and Cacioppo, 1986). It suggests that consumers may rely on heuristics or simplified decision rules related to scarcity, such as "limited supply means high demand," to make their judgments and decisions. Therefore, in the context of fast fashion, the theory of heuristic processing supports the idea that consumers focus on the existence of the scarcity message rather than the specific type of scarcity message.

5.1 Practical implications

This study makes several recommendations for managers and practitioners to improve the effectiveness of scarcity messages in a fast fashion context. These recommendations are crucial in determining the success of companies using scarcity messages as competitive marketing strategies in the future. The results indicate that FOMO has a partial mediation effect on the link to impulsive buying tendency. Thus, it gives an insight that fast fashion retailers can use scarcity and FOMO can as powerful tools to drive impulse buying by creating a sense of urgency among consumers. However, retailers should be aware that the effect of different types of scarcity messages may vary depending on the context and culture, and they should test which type of scarcity message is most effective in their specific market.

While PS and FOMO can be effective in driving consumer behavior, it is crucial to ensure ethical practices. Retailers should avoid using deceptive tactics or creating artificial scarcity. Transparency and honesty should be maintained in marketing communications. The use of scarcity messages should be designed to create a positive customer experience rather than trying to manipulate them. Retailers should ensure that the use of scarcity messages is consistent with their overall brand values and messaging and that it does not create negative perceptions among customers.

Retailers should avoid creating a false sense of scarcity and utilize the FOMO to benefit the consumer. For example, scarcity messages that trigger FOMO can benefit customers who have been eagerly waiting to acquire a product for a long time and have high brand loyalty. Additionally, retailers should be transparent about the availability of products and communicate any limitations or restrictions in a transparent and honest manner. This will help to build trust and maintain positive relationships with customers in the long term. Accordingly, fast fashion brands and retailers, consumer advocacy organizations, regulatory bodies and even individual consumers can help consumers afflicted with impulse shopping of fast fashion by taking preventive measures to raise customers' awareness against scarcity messages.

The present study's findings have significant practical implications for sustainability, as sustainability has become a prominent topic in the literature, and the fashion industry has increasingly focused on sustainable and ethically responsible production. Consequently, the unconscious utilization of scarcity messages and the triggering of FOMO can potentially yield negative consequences for society, institutions and individuals. Furthermore, it is important to acknowledge that leveraging PS and FOMO may lead to impulsive or unnecessary purchases. This can have financial implications for consumers and potentially contribute to overconsumption. Therefore, it is essential to strike a balance and promote responsible consumer behavior. In this regard, the sustainability aspect of this issue is of great interest to both researchers and practitioners.

5.2 Limitations and future research directions

There are a few limitations that need the attention of the researchers for future studies. First, we obtained data from students who had previously visited fast fashion stores. The prior purchasing experience was not a prerequisite for participation in the research. Second, this study relied heavily on participants' imagination and ability to engage with the scenarios presented. Therefore, future studies could focus on individuals who have engaged in actual purchasing behavior and other age groups. Third, the manipulation sentences used in data collection can be counted among the study's limitations. These sentences may need to be revised for research in different contexts and retailing settings. Future studies could use alternative manipulation sentences and demand-induced scarcity messages rather than supply-driven messages. Fourth, within this research's scope, FOMO was considered the first-order construct in the analysis. The subdimensions of FOMO, personal and social FOMO, were not analyzed separately. Future studies may test FOMO with its subdimensions, which may have distinct effects on IBT. Moreover, scarcity messages can be perceived differently by consumers from various cultures (see, e.g., Islam *et al.*, 2021; Lee *et al.*, 2015); therefore, it is recommended that future studies should be conducted on diverse cultures in different contexts.

Additionally, although studies conducted on different product categories have revealed that the impact of scarcity messages varies depending on the retail environment (online vs. offline), this distinction has yet to be tested specifically for fashion products. Therefore, future studies can compare and test the existence of this distinction in a single comparative study. Future studies can also examine the potential effects of personality traits, such as the need for uniqueness and the need for popularity, or social influence, such as social acceptance, in this relationship instead of FOMO. Finally, we recommend that future studies analyze the relative effects of scarcity messages rather than focusing only on the impact of a specific variable on another.

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Appendix

The supplementary files are available online for this article.

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