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The Impact of Time-Limited Promotions on Generation Z Consumer Behaviour in Online Retail

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Master in Management

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Department of Marketing, Operations and Management

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Resumo

Os negócios online estão cada vez mais a recorrer à escassez de tempo como estratégia para aumentar o envolvimento dos consumidores e impulsionar as vendas. No entanto, evidências empíricas contraditórias levantam questões sobre a real eficácia desta tática promocional, destacando a importância identificar em que contextos ela pode trazer resultados positivos. Este estudo analisa o impacto das promoções de tempo limitado no comportamento de compra da Geração Z, propondo fatores moderadores, como o interesse pré-existente no produto promovido, o tipo de produto e o nível de impulsividade pessoal. Através de uma abordagem quantitativa, foram recolhidos dados de uma amostra de consumidores com um inquérito online. Utilizando análises como a ANOVA de fatores fixos e modelos de regressão linear, os resultados mostraram que a Geração Z apresenta uma notável capacidade de resistir à pressão imposta pelos prazos limitados. O comportamento de compra deste grupo é mais influenciado pela relevância e interesse pessoal no produto, em detrimento do próprio limite de tempo. Produtos com uma forte componente emocional, como bilhetes de avião, geram um maior nível de excitação percebida, que por sua vez aumenta significativamente a intenção de compra. A conclusão do estudo aponta para a necessidade de repensar as estratégias tradicionais de escassez de tempo no retalho online, uma vez que a Geração Z, mais cética quanto à autenticidade das ofertas, tende a responder melhor a promoções personalizadas e precisamente direcionadas, relativamente a campanhas generalizadas com prazos limitados.

Palavras-chave: escassez de tempo, promoção online, comportamento do consumidor, excitação percebida, Geração Z

Classificação JEL:

M31 – Marketing

M37 – Publicidade

D12 – Economia do Consumidor: Análise Empírica

Abstract

Online businesses are actively using time-limited promotions to boost consumer engagement and sales. Yet, contradicting empirical evidence questions the effectiveness of this promotional tactic. This dissertation investigates the impact of time-limited online promotions on the purchasing behaviour of Generation Z – a demographic known for its digital fluency and scepticism towards traditional marketing tactics. The research framework incorporates the proposed moderating factors like prior interest in a promoted product, product type, and role of personal impulsiveness. Data was collected through an online survey as a part of a quantitative research design, utilising One-Way ANOVA and linear regression to examine time scarcity effects on behaviour. This study discovered a distinctive ability of Gen Z to withstand the pressure of time limits. The research findings show that the purchasing behaviour of this consumer segment is better driven by the relevance and personal interest in a promoted product, rather than the limited timeframe itself. The research was conducted across four product categories, revealing that emotionally fulfilling experiential products, represented in our study by flight tickets, generate greater arousal, which, in turn, is a significant determinant of purchase intention.

This study concludes that the traditional time-scarcity tactics in online retail may no longer appeal to consumers, especially younger and more sceptical about the authenticity of an offer. Businesses may benefit from applying time limits to more personalised, precisely targeted offers, rather than using it as a primary overarching marketing strategy.

Keywords: time scarcity, online promotion, consumer behaviour, perceived arousal, Generation Z

JEL Classification:

M31 – Marketing

M37 – Advertising

D12 – Consumer Economics: Empirical Analysis

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1   Introduction

Scarcity promotion is a marketing strategy, that is based on the fundamental psychological principle: the scarcer the product, the more desirable it becomes (Cialdini, 2021). In turn, product scarcity refers to a current or potential unavailability of a product, which creates a perception of urgency and increases the product's desirability and value in the eyes of consumers. Its psychological underpinnings denote the deep-rooted position of relationship with scarcity in human nature making it a powerful influence tool in the hands of marketers. Facilitated by technological advances, scarcity cues are gaining popularity among online retailers, enabling the use of a wide variety of tools to create a perception of product scarcity among consumers. From large marketplaces like Amazon, eBay, and AliExpress to specialized online learning platforms like Udemy, online businesses have been widely using scarcity appeals to attract customers' attention and increase the market performance of their products. Compared to the offline shopping context where scarcity effects on consumer behaviour have long been studied, the online setting of scarcity applications remains under-researched. Given the ever-evolving nature of the online shopping environment and rapid shifts in consumer behaviour tendencies, this area suggests vast research opportunities.

The majority of scientific papers on scarcity online promotions focus on quantity-related scarcity, where scarcity can be justified by the limited nature of the product due to restricted supply or increased consumer interest resulting in stocks running out (Weinstein, 2023). In contrast, time-related scarcity is by its nature an artificial marketing tactic, often seen as manipulative. Its successful implementation requires specific knowledge of effective implementation tools, frequency and customers' attitudes towards time-scarcity promotions.

While time-related scarcity promotions are a commonly used tactic in online advertising, their effectiveness varies significantly across different contexts (Hmurovic et al., 2023). The challenge lies in the lack of comprehensive empirical evidence regarding how various factors – such as marketplace characteristics, consumers' traits, and the type of promoted product – interact and influence consumers' perceptions of scarcity promotions and their subsequent purchasing behaviour. This gap in empirical understanding makes the application of time-scarcity online promotions intuitive and leads companies to the trial-and-error approaches, which might backfire on brand perception if their promotions are seen as ingenuine and manipulative (Mohr & Kühl, 2021).

1.1 Research Problem

Based on the limited empirical evidence regarding the efficacy of time-related promotions in an online shopping context and yet them being a commonplace marketing practice, the research problem can be formulated in the following manner:

Online retail represents a distinctive functioning context for scarcity promotions, compared to the offline environment, with its specific moderating factors (Hmurovic et al., 2023). Consumers' perception of scarcity appeals is affected by new characteristics such as the type of online marketplace, digital tools used to deliver the scarcity message and its framing. Hence, the effects of scarcity promotions on consumer purchasing behaviour observed in offline settings cannot be extrapolated to the online context. The E-commerce environment requires a relevant in-depth analysis of how scarcity marketing can be employed online and what underpinning theory can enhance its effectiveness.

This dissertation particularly focuses on the consumer behaviour of Generation Z, which is growing its spending power and soon will be shaping the online shopping environment (Gutierrez, 2021). For this reason, their response to time scarcity promotions presents a critical area of interest, providing valuable insights both for scarcity theory and practitioners seeking ways to approach this generational cohort. Given this generation's constant exposure to digital marketing, it is essential to understand how they perceive such tactics and whether their responses differ from previous generations (Salam & Pratiwi Ar, 2024).

1.2 Research questions

Therefore, a research question guiding the development of this dissertation is formulated as follows:

How effective are online limited-time promotions in influencing Generation Z's purchasing behaviour, and what psychological factors and product-related variables moderate their responses to such promotions?

This question can be further divided into a more specific subset of questions, each addressing an important aspect of the time scarcity influence on the consumer behaviour of Gen Z.

Research question 1 (RQ1): how do online limited-time promotions affect Generation Z's purchasing behaviour compared to non-time-limited promotions?

Research question 2 (RQ2): what are the key psychological factors driving Generation Z's reactions to online promotions that emphasize time scarcity?

Research question 3 (RQ3): to what extent does the type of product being promoted moderate the effectiveness of time-limited online promotions for Generation Z?

Research question 4 (RQ4): how does prior interest in a product influence Generation Z's perception of and response to time-constrained promotions?

Research question 5 (RQ5): how does personal impulsiveness affect the relationship between time-scarcity promotions and Generation Z's purchasing behaviour?

1.3   Research objectives

After conducting a preliminary literature review guided by the established research questions, the following objectives were formulated to provide a clear direction for the development of this dissertation:

1   investigate the influence of online limited-time promotions on purchase intentions of Generation Z;

2   explore psychological underpinnings of the Gen Z reactions to time-related promotions, with a focus on perceived arousal;

3   test the moderating role of product type in the relationship between time scarcity and purchasing behaviour;

4   examine the impact of prior interest in the promoted product on the perception of time scarcity applied to the offer;

5   examine the role of personal impulsiveness in the relationship between time-scarcity promotion and purchase intention.

This dissertation first introduces the review of relevant scientific articles, highlighting the existing contradictions and knowledge gaps that further set a foundation for hypotheses formulation and development of the conceptual model. Next, the methodological approach is discussed, describing the research design, and tools for data collection and analysis. The following research findings chapter presents the analysis results concerning research hypotheses. These results are later discussed and compared to the relevant scientific papers to

justify the theoretical contribution of this thesis, alongside its practical implications for businesses employing limited-time promotions or selling to Gen Z. Lastly, this study ends with the conclusion chapter, which contains the limitations and avenues for future research, as well as practical recommendations.

2 Literature review

As one of the most powerful drivers of human behaviour, scarcity has been widely leveraged by marketers to boost sales and increase consumer engagement (Cialdini, 2021). By creating a sense of urgency or exclusivity, scarcity can influence the decision-making process and increase demand for promoted products (Weinstein, 2023). However, its success is not universal, as its effectiveness is shaped by a range of consumer and promotion-related factors that determine how consumers will perceive and respond to scarcity-related promotion (Hmurovic et al., 2023).

This chapter synthesizes relevant literature to explore psychological and behavioural mechanisms underlying scarcity, how it is applied in marketing, its influence on consumer behaviour, and the factors that moderate its impact. This knowledge establishes a foundation for further exploration of the effectiveness of scarcity marketing in the modern digital context, particularly when targeting the digitally native Generation Z.

2.1 Scarcity and marketing

Scarcity is one of the most powerful principles of influence (Cialdini, 2021), which shapes decisions and, consequently, lives. It attracts attention, causes obsessions, and makes people compete (Weinstein, 2023). On the one hand, scarcity has its roots in the foundational economic relationship between supply and demand, when demand exceeds supply leading to a limited availability (Shi, Li, & Chumnumpan, 2020). On the other hand, the shortage could have been created artificially by restricting supply and limiting access to resources (Chen et al., 2020). People tend to see scarce items as more valuable and desirable compared to abundant ones and show their preference for scarcity as early as at the age of 6, highlighting its deep-rooted position in the human decision-making process (Aggarwal et al., 2011; John et al., 2018).

Scarcity cues may serve as a heuristic, mental shortcut simplifying decision-making for consumers by inferring a product's value based on its popularity and social acceptance (Hamilton et al., 2019). If the product had not met the quality requirements, people would not have continued to buy it – subliminal conclusion (John et al., 2018; Shi et al., 2020).

Powers of scarcity have been successfully harnessed in the marketing domain, establishing a new approach to sales promotion. Scarcity marketing is defined as a strategy employed by marketers with the aim of boosting demand. It emphasizes the limited availability of a product or service which leads to a sense of urgency experienced by consumers and increases their

purchase intentions (Chen et al., 2020; Wu et al., 2021). This strategy capitalizes on the basic psychological principle that people tend to desire what is scarce or hard to obtain (Barton et al., 2022).

2.2 Types of scarcity promotions

Scarcity promotions come in three main forms depending on the source of limitation: supply-related, demand-related, and time-related scarcity (Barton et al., 2022). All these types have different effects on consumers' behaviour and are used in different contexts.

2.2.1 Supply-related scarcity

Supply-related scarcity occurs when a company produces a limited quantity of products due to limited production capacity or disruptions in its supply chain (Shi et al., 2020). However, supply might be restricted intentionally to create a sense of scarcity artificially. Both ways are proven to be successful if the scarcity message is justified and delivered via a credible source of information or an expert in the product's field (Weinstein, 2023).

Supply-related scarcity promotions can take the form of limited-edition products, exclusive clubs and events, privileges, and additional services. Limited edition is the most popular and effective strategy which suggests that a product is produced in restricted quantities, with distinctive characteristics and harder access to, and at a higher price. All these characteristics suggest products' exclusivity and uniqueness. This type of scarcity appeal works best with consumers who share the need for uniqueness, prestige, respect, and exclusivity (Chen et al., 2020; Cengiz & Şenel, 2024). Through the consumption of scarce products, consumers aim to reflect or raise their social status. This type of consumption becomes a form of self-expression, where products used help to create an image of consumers as unique, elite, affluent, and prestigious. Alongside signalling consumers' exclusive ability to get those limited-edition products into their procession, reinforcing their distinctive social status serves as a social proof of products' value, which subsequently attracts more customers, thus creating a bandwagon effect (Barton et al., 2022).

Demand-related scarcity promotions aim to highlight or create a perception of product scarcity that was induced specifically by consumers' interest. The underlying principle is that a popular product is seen as valuable and desirable. In physical stores, this principle is illustrated by the empty-shelf effect, where people assume a small quantity of product left to be a signal of its quality and prefer buying "secure" products, especially under conditions of uncertainty (Shi et

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al., 2020). In the online context, retailers use a common practice of labelling "Best Seller" items or attaching notions about how many pieces are "Left in stock" or how many have already been bought (Chen et al., 2020; Broeder & Wentink, 2022). Another technique is sending notifications about purchases of the products that the consumer has on the wishlist or shopping cart. These messages are aimed at creating a sense of urgency and nudging consumers into purchasing (Rosenberg & Siegel, 2018; Cialdini, 2021).

2.2.2 Time-related scarcity

Limited-time promotion is a marketing tactic that aims to create a sense of urgency by highlighting the deadline of an offer at the same time implying that after this period consumer loses an opportunity to take advantage of a good deal or to possess a product (Hmurovic et al., 2023). This strategy tackles the issue of consumers' tendency to procrastinate in the final stages of the purchasing process by prompting quick action under time pressure (Cialdini, 2021).

Time-restricted promotions come in different forms – flash sales, limited-time offers, countdown timers, and seasonal offers. Black Friday also falls into this category.

Time-related promotions are most effective in e-commerce, as companies can benefit from using real-time updates about the time left till the end of the promotion (countdown timers) and sending reminders encouraging the purchase as a way to not miss out on a good deal (Weinstein, 2023).

2.3 Psychological underpinnings of scarcity-related promotions

The effects of scarcity marketing on consumer behaviour can be better understood by studying the psychological and behavioural human tendencies that are being triggered by an encounter with scarcity (Weinstein, 2023). The existing body of research on scarcity influence has suggested several theoretical frameworks, each offering a slightly different angle of view, yet collectively providing a comprehensive lens through which scarcity mechanism can be deciphered.

2.3.1 Commodity theory

One of the first attempts to decode scarcity's influence on human behaviour was made by Timothy C. Brock in a 1968 study that introduced commodity theory according to which scarcity, as a product characteristic, increases the psychological value of any product or service that can be possessed, transferred from one person to another, and useful. The central principle

of the theory states "any commodity will be valued to the extent that it is unavailable" (Brock, 1968). It implies that the scarcer and more difficult to obtain a product is, the greater will be the desire to get it and its perceived value (Lynn, 1991). However, Brock and Lynn did not manage to explain the heterogeneity in the effects on behaviour, as results greatly differed in the extent of scarcity influence.

Fromkin and Snyder (1980) contributed to the commodity theory by explaining the underlying psychological mechanism that enhances the perceived value of an item when people are aware of its limited availability. They developed the need-for-uniqueness theory based on Brock's idea that people tend to desire scarce products more than abundant ones because the possession of such products makes them feel unique and distinctive (Fromkin & Snyder, 1980). Personal need for uniqueness significantly contributes to the preference for scarcity, particularly scarcity caused by limited quantity. However, this theory simplifies the explanation of scarcity perception, overlooking moderating and mediating factors related to personal characteristics and social context.

Despite commodity theory being dominant in the scientific literature on scarcity effects, recent studies greatly complement and extend its findings, approaching the main limitation of the theory – the inability to explain variation in the effect size of scarcity appeal caused by different personal characteristics of consumers and ever-changing application context.

2.3.2 Conformity theory

Jones (1985) introduced the concept of conformism, according to which people have an inherent desire to conform to the behaviour of their peers. This might serve as a heuristic, simplifying the decision-making process by providing a valid model of behaviour to follow (Sugden & Jones, 1985). Later, Bernheim (1994) elaborated on the topic and developed a conformity theory which states that people with a high need for conformity often adapt to social norms, aligning their own beliefs, attitudes, and behaviours to ones observed in society. It explains the effect of limited availability on consumer purchasing behaviour, as people subliminally translate product scarcity into popularity and high demand, which in turn increases the perceived value and desirability of a product leading to higher purchase intentions (Shi et al., 2020). This perspective is the opposite of the need for uniqueness (Fromkin & Snyder, 1980), as product scarcity here is caused by high demand rather than limited or restricted supply, hence appealing to different aspirations.

2.3.3 Regret theory

Another relevant scientific work that explains how scarcity affects human behaviour is the regret theory (Loomes & Sugden, 1982). It points out that humans tend to avoid regret in the future. This tendency can be observed when consumers make decisions under conditions of time pressure, such as in time-limited offers (Shi et al., 2020). They demonstrate higher purchase intentions for scarce products as a defence mechanism against missing out on a valuable product or good deal. This phenomenon later received the name "FOMO" – fear of missing out (Cialdini, 2021). Consumers often experience FOMO when they believe a popular product may soon become unavailable. This fear can prompt quicker purchasing decisions to avoid missing out on something that others are enjoying. Hence, the decision to engage in the purchase is motivated not by the utility brought by product use but due to the fear that the product won't be available later and consumers lose the opportunity to get their hands on it (Hamilton et al., 2019).

2.3.4 Reactance theory

Preference for scarce products can be approached from the perspective of reactance theory (Brehm, 1966), which explores how freedom of choice and its restriction influence behaviour. Once our freedom is threatened, we experience psychological reactance in the form of an increased desire to engage in a restricted activity (Rosenberg & Siegel, 2018). The object of restriction becomes more attractive and desirable. In this case, the reaction to scarcity appeal can be defined by the need-for-freedom concept (Shi et al., 2020). Weinstein (2023) also points out that reactance can be caused not only by a desire to possess a product but also by fear of losing the freedom to buy it when you want. Therefore, the purchase of a product with a restricted supply or under limited time is perceived as a way to restore one's freedom of action.

2.3.5 Competitive arousal theory

Competitive arousal was first defined as a "sympathetic activation of the autonomic nervous system" (Schachter & Singer, 1962). Ku and Adam (2022) have revised and elaborated on the concept, defining it as arousal evoked before, during, or after an interaction in a competitive environment. Competitive arousal can be observed in consumer behaviour when they are engaged in the purchase of products with limited availability, as it implies that not everyone can possess it and some level of competition might be required to get the chance to obtain a scarce product (Broeder & Wentink, 2022). The higher the value or more unique a product is

the greater arousal it creates among consumers. Competitive arousal is believed to have an evolutionary basis since it contributes to success in competing for scarce resources required for survival (Ku & Adam, 2022). Therefore, actual social interaction is an important driver of arousal. The presence of a counterpart – a real person or computer agent, serves as a stimulus to action. Time pressure also significantly increases competitive arousal (Ku et al., 2005). Competitive arousal impairs consumers' ability to make rational decisions leading to impulsive purchases that are often later regretted. This mental state, characterized by excitement regarding the product being promoted, diminishes logical reasoning, hence the ability to make informed decisions. Consumers are prompted into a purchase by subliminal force rather than through logical reasoning (Ku & Adam, 2022).

Although the concept of competitive arousal isn't new, most of the existing research on its implications is limited to such contexts as auctions, negotiations, and bargaining(Ku et al., 2005; Lamis et al., 2022). In the consumer behaviour area, emotional or perceived arousal is a more common concept used to explain the psychological state caused by scarcity promotions, while maintaining the same underlying psychological mechanisms (Wu et al., 2021). Emotional arousal theory builds upon the findings from competitive arousal studies, extending the application to consumer behaviour. Scarcity-related promotions trigger similar emotional responses which alter the decision-making process much like in competitive settings.

2.4   Impact of scarcity-related promotions on consumer behaviour

The use of scarcity cues is a widely used promotional tactic in marketing due to its significant impact on consumer behaviour. Products and services with limited availability are becoming more desirable and as consumers assign more value to them based on their perceptions of the reasons behind the nature of scarcity (Lynn, 1991). Therefore, scarcity-framed promotions trigger a variety of emotional responses and increase arousal among consumers, often leading to quicker decision-making and unplanned purchases (Wu et al., 2021). These reactions most often are fueled by perceived urgency and FOMO, as consumers expect that without prompt action, they will lose the chance to take advantage of a good deal or possess a product that is "running low in stock" (Rosenberg & Siegel, 2018).

The emotional state being experienced during and after exposure to a scarcity-related promotion greatly influences the decision-making process. In case of restricted promotion time, consumers are nudged to act quickly, reducing the time usually needed to make a decision about the purchase. The reason lies in the perceived urgency that makes consumers bypass such

steps like search and comparison of alternatives and consideration phase, decreasing hesitation and time spent on the decision making (Cialdini, 2021). This effect is particularly useful in online settings where consumers have unlimited access to all possible alternatives to make an informed choice (Chen et al., 2020).

Emotional responses described are highly associated with impulsive behaviour. Scarcity promotions often lead to unplanned spontaneous purchases, particularly for consumers inclined to impulsive purchasing behaviour (Broeder & Wentink, 2022). This behaviour is reinforced by persuasive time restrictions and reminders of regret experienced in case of late reaction to promotion. Therefore, a significant body of research concludes that scarcity promotions increase purchase intentions and impulsive consumer behaviour.

However, recent studies argue that inappropriate use of scarcity framing may backfire evoking negative perceptions of the brand as being manipulative (Hmurovic et al., 2023). The overuse of limited-availability cues greatly decreases their effectiveness as consumers become accustomed to such marketing tactics, no longer seeing them as authentic (Khetarpal & Singh, 2024). As a result, consumers no longer experience the same arousal and the promotion loses its impact.

2.5   Offline versus Online scarcity promotions

The use of scarcity messages in brick-and-mortar settings has generally shown a positive effect on consumers' purchase behaviour. An extensive body of research demonstrates their effectiveness across different product groups in offline environments (Hamilton et al., 2019; Goldsmith et al., 2020). However, the same positive results are not consistently observed in a digital world.

The effect of quantity and time-related scarcity promotions varies depending on the context – offline versus online. Limited quantity scarcity tends to be more persuasive in physical shops, where consumers can see real proof of the limited availability through the empty shelf effect. Moreover, their reaction is intensified by the presence of social proof and developing competitive arousal, as consumers can observe the interest and purchasing behaviour of other customers (Cialdini, 2021). Meanwhile, promotions with a restricted time frame did not receive a unified opinion on their effectiveness across different settings.

The existing body of knowledge provides contradicting findings regarding the efficacy of scarcity-related promotions, particularly with time limits, in an online shopping context compared to offline setting.

On the one hand, Chen et al. (2020) claim that the combination of quantity and time-related scarcity promotions amplifies their effect increasing perceived urgency and imposing competitive pressure on consumers which activates consumer purchasing behaviour. Wu et al. (2021) further report that scarcity cues in their empirical study significantly increased consumers' emotional arousal and, consequently, impulsive purchasing behaviour by 40%. However, the results are difficult to generalize as the sample appeared to be not representative consisting only of undergraduate Chinese students from the same university. Moreover, the research design did not incorporate a control condition, limiting the ability to validate the observed scarcity effect.

On the other hand, Hmurovic et al. (2023) claim that online scarcity promotions are less effective than offline and generally do not yield superior to control group results. They suggest that consumers experience higher Persuasion Knowledge (PKM) in an online setting, meaning that they are better aware of being targeted to and showcase scepticism towards the promotional message. Researchers point out that repetitive use of limited-availability cues may result in reduced responsiveness to scarcity messages, diminishing the effectiveness of this tactic (Khetarpal & Singh, 2024). Additionally, the online shopping context induces higher levels of psychological distance to the product (Hmurovic et al., 2023).

As a countermeasure, researchers suggest that providing exogenous justification for promotions, such as end-of-season sales or customer birthdays will reduce persuasion knowledge and make promotions seem more genuine (Hmurovic et al., 2023).

In conclusion, many studies claiming that scarcity framing positively influences purchasing behaviour in an online context rely on non-representative samples and provide weak validation of the scarcity effect on consumer behaviour. The current state of research highlights the need for further exploration of scarcity-related marketing promotions in online settings, particularly time-restricted, with the application of more reliable methodologies and broader sample populations.

2.6   Consumer-related moderators of scarcity efficacy

The effectiveness of scarcity-related promotions highly depends on consumers' characteristics, which shape the perception of promotions and following response to them. The main characteristics outlined in the relevant literature are impulsiveness, psychological drivers of behaviour, persuasion knowledge, and cultural contexts (Shi et al., 2020; Hmurovic et al., 2023).

Firstly, personal impulsiveness plays an important role in defining consumer behaviour. In scarcity marketing it is a beneficial factor that alleviates the perceived urgency and emotional response to the limited availability, which in turn, leads to impulsive purchases (Broeder & Wentink, 2022). Hence, marketers can get the highest returns on promotions targeted at consumers who are exhibiting impulsive purchasing behaviour tendencies. Such consumers experience immediate pressure to act and spend less time considering the purchase (Chen et al., 2020). Yet, not all researchers observe the effect of personal impulsiveness on the relationship between scarcity promotion and impulse purchases (Wu et al., 2021).

Secondly, as was mentioned in the previous sections of the literature review, the reaction to a scarcity message depends on how accurately the type of scarcity, and its framing, matches the consumer's psychological drivers of behaviour which include: need for uniqueness, need for conformity, need to avoid future regret, and need for behavioural freedom (Shi et al., 2020). Although, several of them can be at play simultaneously.

Thirdly, some consumers are already well aware of the scarcity tactics used to boost sales and become sceptical about the trustworthiness of the marketing claims. They begin to develop persuasion knowledge – an awareness of being targeted with promotional messages intended to push the person into making a purchase (Hmurovic et al., 2023). This awareness is suggested to diminish the effectiveness of scarcity cues, as consumers do not perceive the promotion as genuine (Weinstein, 2023).

However, most of the research papers aimed at studying the effect of persuasion knowledge on the relationship between scarcity-related promotion and consumer behaviour had questionable methodologies. Respondents were primed to think about promotions as manipulative by being exposed to the introductory message of the questionnaire saying that limited-availability promotion claims were not true and only served the goal of increasing company profits (Mohr & Kühl, 2021). Hence, when later results were compared to the group without this revealing message, participants turned out to be less responsive to the ads, supposedly proving the effect of the Persuasion Knowledge Model (PKM). This points out the issue of priming respondents for certain responses by specific scenario framing.

Lastly, the consumer response to scarcity-related promotions is partially determined by cultural context (Chen et al., 2020). Wu et al. (2021) suggest that consumers from collectivistic cultures like China, for example, are more responsive to scarcity messages. Their behaviour is driven by ingrained social norms and competitive pressure, which make these consumers more responsive to scarcity appeals as they need to conform and not miss out. While consumers with individualistic cultural backgrounds are better motivated by promotions highlighting personal

gains and uniqueness. Their behaviour is driven by the need to stand out rather than to conform to social tendencies (Rosenberg & Siegel, 2018).

2.7 Promotion-related moderators of scarcity efficacy

The second group of factors that moderate the perception of scarcity marketing tactics relates to the promotion structure, specifically, the type of scarcity, product category, scarcity framing, and justification (Cialdini, 2021; Hmurovic et al., 2023; Weinstein, 2023). These variables influence the relationship between scarcity promotion and consumer behaviour by shaping the perception of scarcity and product value, ultimately determining the likelihood of purchase (Shi et al., 2020).

The choice of scarcity type depends on the context and product category. For example, luxury high-status goods imply rarity and exclusivity, which are better match for limited-quantity scarcity, specifically with a restricted supply basis (Aggarwal et al., 2011). In contrast, for fast-moving consumer goods, which do not require deep considerations before purchase, limited-time promotions will be a better fit, as they drive prompt impulsive purchasing behaviour (Broeder & Wentink, 2022).

Another important moderator is scarcity framing. Promotions may be gain or loss-framed, appealing to different psychological drivers of behaviour. Cialdini (2021) and Shi et al. (2020) highlight that loss framing outperforms gains, as loss aversion is a deeply rooted behavioural tendency that is a better motivator than potential gains. When exposed to loss-framed promotion, consumers experience greater emotional arousal that is fueled by fear of missing out on a good deal compared to the highlighted benefits that come with the purchase (Weinstein, 2023).

Overall, to be successful and drive purchasing behaviour scarcity-related promotions must be perceived as genuine and trustworthy (Khetarpal & Singh, 2024). If consumers do not see value in a deal and instead only the manipulative intent of marketers, they will not react to the promotions, or even worse, they may develop a negative image of the brand. Therefore, scarcity should always be justified. Hmurovic et al. (2023) suggest providing exogenous justifications to increase the validity of the claims and seem less manipulative.

In conclusion, scarcity is a powerful tool of influence, that with an appropriate application can generate engagement and boost sales. The reviewed literature reveals that quantity and time-limited promotions increase desirability of the product and perceived urgency. However, the

effectiveness of scarcity marketing is not universal as its perception is determined by a range of consumer and promotion-specific factors. Additionally, positive results observed in an offline environment cannot be so surely expected in a digital context, where consumers exhibit greater persuasion knowledge decreasing their responsiveness to scarcity-related promotions. The digital environment remains under-explored with limited empirical evidence of the time-limited promotion influence on consumer behaviour.

Recent studies do not provide a comprehensive perspective on the topic, focusing on a specific type of product or distinctive socio-economic sample, which decreases the generalizability of the findings. Moreover, there is a controversy in the research findings regarding the effectiveness of online limited-time promotions. Hence, these knowledge gaps will serve as a foundation for the formulation of hypotheses and conceptual model development in the next chapter.

3   Conceptual model

Despite the widespread use of scarcity-related promotions in e-commerce, their efficacy stays overlooked by researchers assuming the transition from the offline context does not moderate the results of these promotional campaigns. Authors of the most recent study (Hmurovic, 2023) argue that time-limited online promotions shouldn't be expected to be as effective as offline ones, highlighting the lack of studies to confirm their results. However, this state contradicts the fact of them being employed by a vast majority of e-marketplaces. This gap should be studied further to find an explanation of their effects on consumers buying behaviour. We aim to develop a framework that accurately explains the effects of time-scarcity promotions on consumer behaviour by incorporating the most relevant concepts from the reviewed literature and establishing connections between them to reflect real-life cause-and-effect relationships. Additionally, to refine and elevate the descriptive power of the model we enter new constructs that we believe will play a role in explaining the influence of promotions on purchasing behaviour.

Based on the insights and knowledge gaps found during the literature review, this chapter introduces the research hypotheses and their visual representation – conceptual model developed to streamline and facilitate the research process. The model is designed to explain the relationship between time-limited online promotions and consumer behaviour, particularly purchase intention as a primary outcome, by connecting and mapping the key variables that moderate this relation.

3.1   Hypotheses formulation

Any form of restriction typically causes inconvenience or discomfort for individuals, which in turn evokes emotional responses (Shi et al., 2020; Cialdini, 2021) The same logic can be applied to scarcity marketing to understand the relationship between a restricted time frame of promotion and consumer behaviour.

When consumers are exposed to time-limited promotions, they often feel the time pressure. This sense of urgency results in an emotional reaction that has an influence on their decision-making process (Shi et al., 2020; Weinstein, 2023). Consumers feel the need to make decisions faster than they are used to and consequently, they spend less time considering the purchase and its rationality (Cialdini, 2021). The literature specifies this state as "perceived arousal" or "emotional arousal", which arises from the competitive arousal theory (Ku et al., 2005). This theory states that increased arousal implies higher emotional engagement with a trigger –

limited-time promotion and leads to impulsive behaviour. Arousal is also intertwined with FOMO, as the more inclined to experience FOMO a consumer is, the more aroused he or she will be during the encounter with scarcity.

Therefore, consumers are expected to experience greater perceived arousal after observing a promotion with a limited timeframe rather than a control promotion without time limits. This expectation is reflected in the first hypothesis:

H1: Limited-time promotion leads to a higher perceived arousal compared to a control promotion with no time limit.

The effect of time-related scarcity on consumer behaviour is not universal and depends on a wide range of factors, among which is the type of product being promoted. The existing research typically overlooks its role or just partially acknowledges it. Some papers highlight this gap as a call for future research that needs to study the influence of scarcity across different contexts and product categories (Shi et al., 2020; Ladeira et al., 2023). That justifies the inclusion of product type as a moderating variable in the research model of this study.

Therefore, it is anticipated that the relationship between time scarcity and perceived arousal is moderated by the type of product being promoted, which implies that scarcity has a varying effect on consumer behaviour based on the nature of the product and context. The second hypothesis synthesizes this anticipation:

H2: The type of promoted product moderates the relationship between time-scarcity promotion and perceived arousal.

To better understand the drivers of scarcity efficacy, particularly consumer-related factors, it was decided to incorporate Interest in the promoted product as a moderating variable. It is expected to reflect the pre-existing consumers' preferences, serving as an individual-level factor. This will contribute to the theoretical development of scarcity marketing research, diving deeper into the nuanced mechanism of scarcity influence and its interaction with consumer-related factors.

The inclusion of Interest enables to personalize the responses and further study scarcity influence across consumer segments based on their level of interest, which later will help in understanding which customer segments are more responsive to scarcity tactics. Eventually,

these insights can guide the development of targeted marketing strategies and optimize promotional efforts.

Incorporating Interest in the product as a moderating variable is expected to increase the predictive accuracy of the model and enhance its ability to explain the variation in consumer behaviour, particularly perceived arousal under scarcity conditions. Hence, the third hypothesis is formulated as follows:

H3: Personal interest in a promoted product strengthens the relationship between time-scarcity promotion and perceived arousal.

Next, coherent with Broeder and Wentink (2022), Perceived Arousal was selected as a mediating variable between limited-time promotion and Purchase Intention, representing a complex indirect effect of time-scarcity appeals. This study claims that emotional reaction to promotion with a restricted timeframe, namely Perceived Arousal, positively affects Purchase Intention. According to the reviewed literature, in the case of time scarcity, arousal is fueled by FOMO, which might make consumers feel anxious. If a consumer does feel aroused and experience anxiety, a purchase can be seen as a way to relieve the stress and avoid the loss of a good deal.

Purchase Intention represents the effect of time-limited promotion, while Perceived Arousal mediates this relationship. Therefore, the expected relationship between constructs is formulated in the fourth hypothesis:

H4: Perceived Arousal has a positive impact on Purchase Intention.

Personal impulsiveness has a significant influence on consumers' decision-making, especially in an online context (Lamis et al., 2022). Rook and Fisher (1995) defined it as a tendency to make spontaneous and unreflective decisions. It leads to decisions driven by emotional factors rather than deliberate consideration, significantly reducing the time required to make a decision (Cialdini, 2021). This characteristic can explain the varying reactions to marketing promotions, as impulsive individuals are more inclined to respond to emotional stimuli by having a higher willingness to buy.

However, Personal Impulsiveness has received controversial evaluations in recent studies that investigated its impact on the perception of scarcity appeals. Wu et al. (2021) did not confirm its influence on a relationship between time scarcity and impulse purchase, while Khetarpal

and Singh (2024) asserted its important role in determining the result of promotion on consumer behaviour. By addressing the controversy in the reviewed literature, this research aims to test how personal inclination to impulsive purchasing behaviour will affect the result of time scarcity within Gen Z, specifically, it is expected that consumers prone to impulse buying are expected to be more responsive to scarcity promotions and likely to convert their arousal into purchase in an online shopping context. Hence, this expectation further shapes the fifth hypothesis:

H5: The relationship between Perceived Arousal and Purchase Intention is strengthened by Personal Impulsiveness.

3.2   Conceptual model

To provide a comprehensive visualization of the research framework, the hypotheses developed earlier were combined in a conceptual model depicted in Figure 1. This model illustrates the relationships between time scarcity (TS) promotion, Perceived Arousal, and Purchase Intention, along with the moderating effects of Product Type, Interest in the product, and Personal Impulsiveness. Each hypothesis is reflected in the connections between these key constructs, offering a clear view of how different factors influence consumer behaviour in the context of time-limited online promotions.
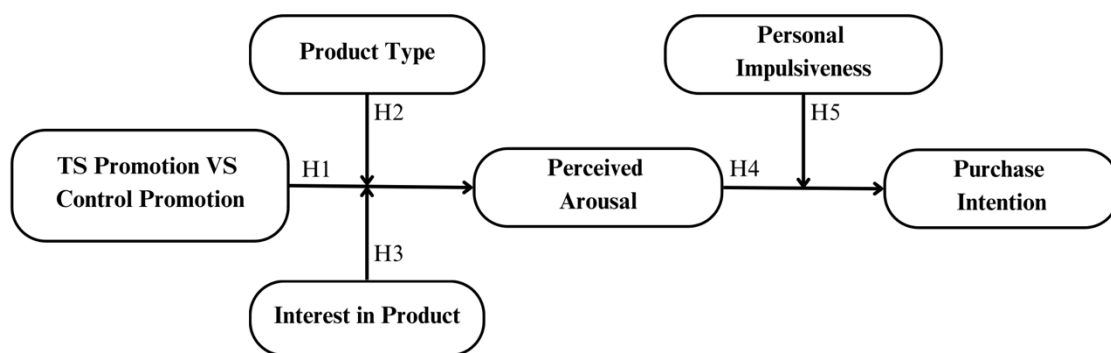
Figure 3.1 Conceptual model

The hypotheses and conceptual model provided in this chapter were informed by suggestions from the relevant scientific papers and designed to guide further development of the appropriate methodology to investigate the effect of time-limited promotions on the consumer behaviour of Generation Z in an online context. The model incorporates constructs derived from the relevant studies together with elements suggested specifically for this research. Such

composition aims to enrich the understanding of time-limited promotions, which remain underexplored compared to other types of scarcity (Hmurovic et al., 2023) and provides a nuanced perspective on an underlying interplay of the moderating factors.

4 Methodology

This chapter explores the methodological approach applied to investigate the relationship between time-scarcity online promotions and consumer behaviour of Gen Z along with the moderating factors described in the conceptual model. It outlines the research design, including the selection of product types that were studied, and the operationalization of the model variables based on the relevant scientific articles that utilized the same constructs. Then the detailed development of a data collection instrument – an online survey, was provided together with the participants' recruitment strategy. The final part explains the analytical tools used to extract valuable knowledge from the collected data and further enrich our understanding of the time-scarcity.

4.1 Research design

This dissertation employs a within-subjects experimental design to examine the impact of time-limited online promotions on consumer purchase intentions across different product types (Keppel & Wickens, 2004). Participants were presented with fictional ads for four different types of products: a digital library service, an online fashion retailer, an online learning platform, and an online travel agency. Each product type was associated with two conditions: a time-limited promotion (scarcity condition) and a non-limited promotion (control condition). The order of ads presentation was randomized to reduce the risk of order and carryover effects, which could confound the results (Keppel & Wickens, 2004). Hence, each participant observed ads in a randomized order, while also being randomly assigned to either TS or control condition varying for each ad observation.

By using this design, the study aimed to isolate the effects of time scarcity on purchase intentions while also exploring whether the type of product influences these effects.

4.2 Target population and sampling method

Existing research on the efficacy of scarcity-related marketing promotions mainly focuses on Millennial shopping habits, overlooking the emerging consumer group known as Generation Z (Gen Z), which includes individuals born between 1995 and 2010 (Francis & Hoefel, 2018). Unlike Millennials, who had to adapt to the internet and digital technologies being already mature personalities, Gen Z grew up immersed in these technologies from a young age (Turner, 2015). This constant exposure to digital environments has likely influenced their cognitive development and purchasing behaviour in ways that differ from previous generations.

Additionally, significant social and cultural shifts took place between these generations (Williams & Page, 2011) which points out the need to study Gen Z shopping habits in depth to ensure that marketing strategies are appropriately tailored to their unique values, behaviours, and preferences. This research is essential for understanding how these shifts influence Gen Z's responses to various marketing tactics, including scarcity-related promotions, and for developing effective strategies that resonate with this new consumer group.

Participants for this study were recruited through a combination of convenience sampling and snowball sampling methods. The survey was created using Qualtrics, and the link was distributed through multiple social media channels.

Additionally, to broaden the reach and enhance the diversity of the sample, the survey was also posted on SurveyCircle, a platform that connects researchers and participants. This approach allowed for the recruitment of participants beyond my immediate network, contributing to a more varied and potentially more representative sample. Through these efforts, a total of 340 responses were collected.

4.3   Data Collection Methods

The empirical data needed for this study was collected through a structured online questionnaire. It was developed using the Qualtrics platform, which provided essential randomization techniques, ensuring that participants were randomly assigned to different conditions. The generated link to the questionnaire was distributed to the participants through various social media platforms. Additionally, the link was posted on the SurveyCircle platform to help achieve a statistically significant sample size.

The design of the questionnaire reflects the logic of the conceptual model aiming to accurately measure the variables and capture relationships between them. Participants were first asked to indicate their interest in the promoted product, followed by questions assessing their Perceived Arousal after their exposure to the promotion. Next, participants responded to items measuring their Purchase Intention. The questionnaire then concluded with a section designed to assess Personal Impulsiveness, followed by general demographic questions.

To ensure readability and avoid survey fatigue, a questionnaire underwent a pilot test by being distributed to several participants from a defined sample. After receiving the responses and feedback regarding the length, clarity, and flow related to the interaction with a questionnaire, it was subsequently refined and primed for distribution to the general sample of survey participants.

The data collection for this study was conducted over a one-month period. This time frame allowed sufficient time for participant recruitment and response collection, ensuring that the sample was large and diverse enough to support the research objectives. During this month, the survey link was actively distributed across different social media and online platforms, to maximize participation.

4.4   Product categories and stimulus material

The efficacy of time-related online promotions is studied across 4 different products to assess how the type of product can influence consumer purchase intentions regarding the promoted product. By including product type as a moderating variable, the developed conceptual model is anticipated to contribute to the existing empirical knowledge and enhance understanding of scarcity as a marketing strategy. Its inclusion is a novel practice suggested in this study.

The main criteria for selecting products to be tested in this study was their popularity among the target population – Gen Z. By focusing on products that are already popular among Gen Z, the study aims to ensure the relevance of the findings and provide insights that are directly applicable to the preferences and behaviours of this consumer group. The popularity metric was assessed through a combination of social media trends and sales data.

Product 1

The study includes a digital library service to capture how scarcity promotions influence consumer behaviour in the context of educational and professional development resources. Digital libraries, like Perlego, have gained popularity among Gen Z users, who prefer the flexibility and accessibility of digital content. These platforms often use promotional strategies such as limited-time discounts to drive subscriptions, making them ideal for examining the effects of scarcity on purchase intentions in an educational context. Gen Z consumers are particularly responsive to digital content and subscription-based services (Westcott et al., 2020), which supports the inclusion of this product type in the study.

Figures 4.1, 4.2 illustrate the stimulus material for the first product that was used in the questionnaire. The website layout was created in a minimalistic style to not distract attention and avoid any resemblance to the existing platforms. The TS condition differs from control only by incorporating "ONLY FOR 24H" frame to the equal promotion and supposed digital timer indicating the time left till the end of promotion.
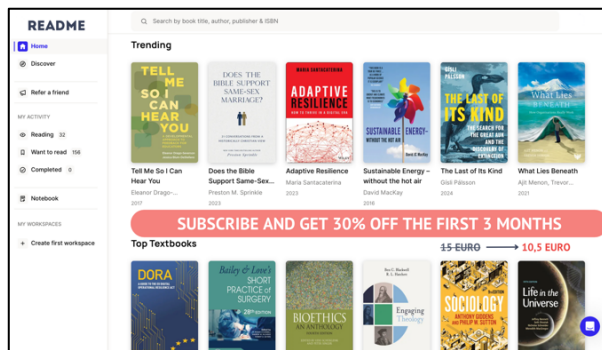
Figure 4.1 Stimulus for product 1 (Control)
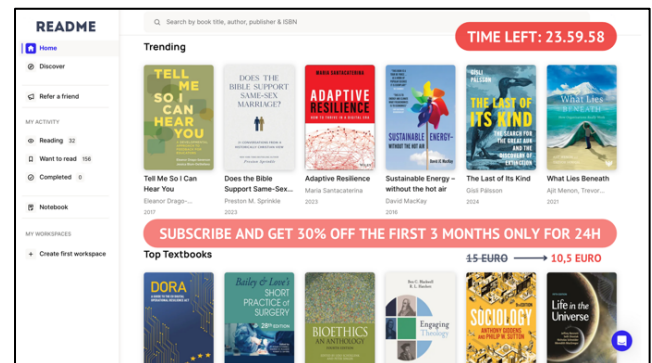
Figure 4.2 Stimulus for product 1 (TS)

Product 2

Online fashion retail was selected to explore how scarcity promotions impact purchase decisions in the fast-paced world of fashion e-commerce. Fashion retailers, like ASOS, are known for their frequent use of time-sensitive promotions, such as flash sales and limited-time offers, which are particularly effective in driving impulse purchases among Gen Z consumers. This consumer segment is highly engaged with online fashion platforms and is often influenced by trends and the fear of missing out (McKinsey, 2019). By including a product type representative of the online fashion industry, the study can provide insights into how scarcity tactics work in a sector where immediacy and trendiness are key drivers of consumer behaviour.

Figure 4.3 and figure 4.4 exhibit the stimulus used in a questionnaire to represent two promotion conditions for an online retail platform selling sneakers. Consistent with product 1, the difference lies in the attached time frame of 24 hours along with digital timer set at "23:59:58".

Figure 4.3 Stimulus for Product 2 (Control)
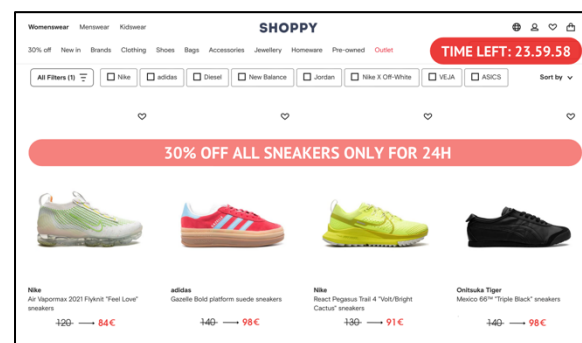
Figure 4.4 Stimulus for Product 2 (TS)

Product 3

The inclusion of an online learning platform allows to examine how scarcity influences decision-making in the context of educational investments. Platforms like Udemy, which offer

a wide array of courses, frequently use scarcity promotions such as limited-time discounts to encourage enrollment. Given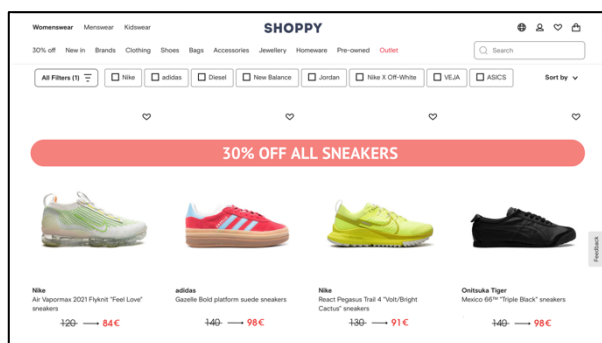 that Gen Z values continuous learning and skill development (Pearson, 2019), this product type is highly relevant to the demographic and provides a useful context for studying the effectiveness of scarcity tactics in the education sector. Gen Z is increasingly turning to online learning platforms, making this a critical area of study.
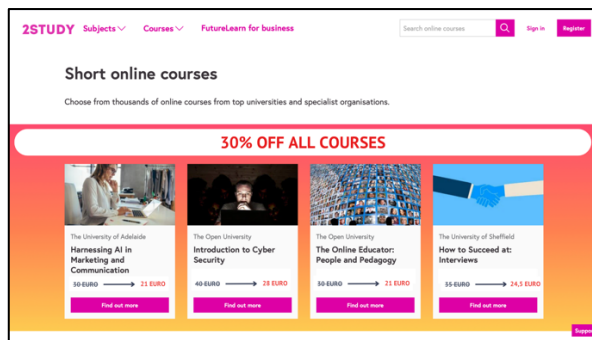
Figure 4.5 Stimulus for Product 3 (Control)
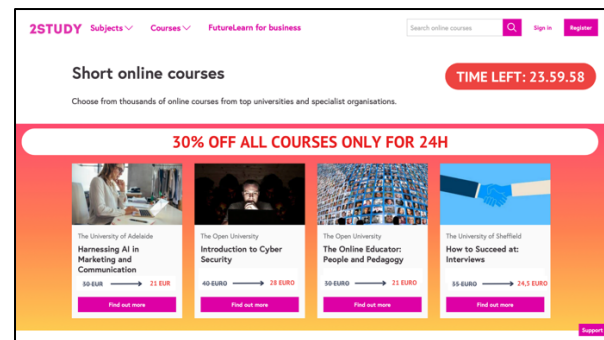
Figure 4.6 Stimulus for Product 3 (TS)

Product 4

An online travel agency was chosen to represent a product type where purchasing decisions are often influenced by high stakes and emotional investment. Companies like Kiwi and Skyscanner are known for using scarcity tactics such as limited seat availability and time-sensitive deals to create urgency in the booking process. These strategies are particularly effective among Gen Z consumers, who are spontaneous travelers and are more likely to make last-minute decisions (Tufft et al., 2024). Including an online travel agency in the study allows for an exploration of how scarcity promotions affect consumer behaviour in the travel industry, where the financial and emotional implications of purchases are significant.
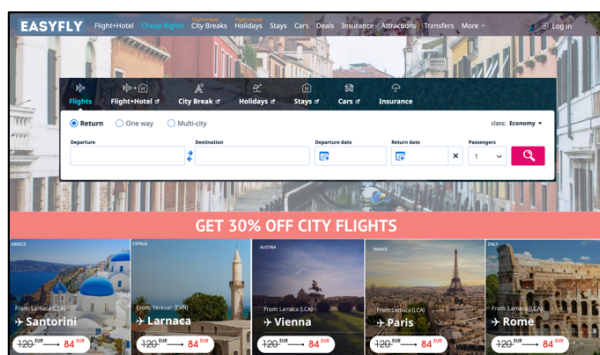
Figure 4.7 Stimulus for Product 4 (Control)
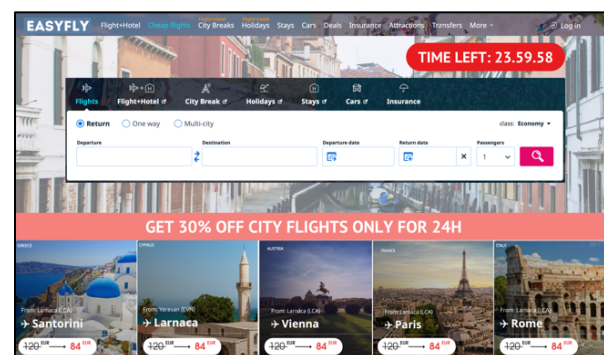
Figure 4.8 Stimulus for Product 4 (TS)

Control vs Time-Scarcity conditions

To isolate the effect of time restriction on consumer behaviour from other external factors, it was ensured that the visual stimuli and the amount of the discount ("30% OFF") were always consistent between control and time-scarcity conditions. The only difference was in the imposing the time frame for the promotion in the time-scarcity condition. The time limit was presented by adding "only for 24 hours" frame to the promotional message. Additionally, to enhance the visibility of time restriction, the digital timer was added to the upper right corner of the screen saying: "Time left: 23:59:58".

4.5   Variables operationalization

The variables included in the conceptual model were operationalized through specific measures adapted from the relevant scientific articles that used the same constructs in their research models (Table 4.1). The following section discusses the measurement approach for each element of the model, following the order of their appearance in the questionnaire.

Table 4.1 Operationalization of the model constructs

Variable	Measure
DV: Purchase Intention	How likely are you to buy this (Product)?
IV: Interest in product	How interested are you in the product that is offered in the promotion?
IV: Perceived Arousal	Adopted from (Lamis et al., 2022): This promotion makes me feel stimulated to buy this product. This promotion makes me feel excited to buy this product. This promotion makes me feel enthusiastic about buying this product.
IV: Personal Impulsiveness	Adopted from (Wells et al., 2011): "Buy now, think about it later" describes me I often buy things without thinking "I see it, I buy it" describes me I often make spontaneous decisions
IV: Age	What is your age group?
IV: Gender	What is your gender?
IV: Country	Where are you from?

The first construct to be measured after seeing a promotion was "Interest in product" using a single item "How interested are you in the product that is offered in the promotion?" and the

responses were rated on the 5-point Likert scale ranging from 1 = "Not at all" to 5 = "Extremely".

Next, Perceived arousal, designed to capture the emotional response to the observed promotion, was assessed using a scale adapted from Lamis et al., (2022), which included the following three items:

- "This promotion makes me feel stimulated to buy this product"
- "This promotion makes me feel excited to buy this product"
- "This promotion makes me feel enthusiastic about buying this product"

Respondents were asked to indicate the extent to which these statements reflected their feelings after seeing the promotion, using a 5-point Likert scale ranging from 1 = "Not at all" to 5 = "Extremely".

Similar to (Broeder & Wentink, 2022), the dependent variable, Purchase Intention, was assessed using a single-item measure: "How likely are you to buy (Product)?". Participants responded on a 5-point Likert scale, ranging from 1 – "Very unlikely" to 5 – "Very likely".

For measuring the independent variable "Personal impulsiveness" participants were asked to indicate to which extent they agree or disagree (1 = "Strongly disagree", and 5 = "Strongly agree") with the following 4 statements adapted from Wells et al., (2011):

- "Buy now, think about it later" describes me
- I often buy things without thinking
- "I see it, I buy it" describes me
- I often make spontaneous decisions

The final section of the questionnaire gathered demographic information including age, gender, and country of origin. Firstly, participants were asked to indicate to which age group they belong, each representing a certain generational cohort: "Under 27" representing Generation Z, "28-43" – Millennials or Generation Y, "44-59" – Generation X, "60 and over" – Baby Boomers. Then respondents answered the question "What is your gender?" by selecting one of the suggested options: "Male", "Female", and "Non-binary / third gender". For the final question "Where are you from?" participants had to choose their country from the drop-down list. Later, all countries were grouped by the continents to simplify the analysis and presentation of demographic data.

4.6 Data Analysis

The data analysis part was structured to rigorously test the research hypotheses and gain insights into how time-limited online promotions influence consumer purchase intentions across various product types.

The dataset retrieved from Qualtrics was carefully cleaned, addressing any missing data and removing low-engagement responses to ensure accuracy. The properly structured file was then uploaded to SPSS, where categorical variables were coded numerically to facilitate statistical analysis. For multiple-choice questions that used a 5-Point Likert scale, responses were coded from 1 to 5, where 1 represented the lowest or most negative response ("Not at all", "Very unlikely", "Strongly disagree") and 5 the most positive with options ("Extremely", "Very likely", "Strongly agree").

Additional binary variables were created to categorize responses, such as "Promotion", where 0 represented the control condition and 1 - time scarcity promotion (TS). All other categoric variables were also coded numerically, such as age group, gender, and country of origin. To simplify the sample description, the country of origin responses were later grouped by continent. These transformations ensured that all responses were consistently formatted and ready for further data exploration and analysis.

Descriptive statistics were computed to summarize key characteristics of the data, providing an initial understanding of the trends and distributions within the sample. Measurement scales for Perceived Arousal and Personal Impulsiveness were tested for reliability and validity using Cronbach's Alpha measure and Exploratory Factor Analysis (Chan & Idris, 2017). To test the hypotheses, a One and Two-way ANOVA was conducted, examining the main effect of Time Scarcity on Perceived Arousal, as well as any potential interaction effects with Product type and Interest. Additionally, paired t-tests were used to compare purchase intentions between the time-limited promotion and control conditions within each product category. Multiple regression analysis further explored the relationships between purchase intention and potential moderators, such as perceived arousal and impulsiveness, offering deeper insights into the predictive power of these variables.

The data analysis was conducted using IBM SPSS Statistics, chosen for its robust capabilities in handling complex data. The results were carefully interpreted, considering both significant and non-significant findings, and were visually presented through charts and tables to enhance clarity.

This chapter outlined the methodology employed in the study, which was designed to investigate the impact of time-limited online promotions on consumer behaviour across four different products. The research employed a within-subjects experimental design, incorporating two promotion conditions – time scarcity and control. For the collection of data, an online survey was developed using Qualtrics platform. Variables of the conceptual model were operationalized and represented in the questionnaire using validated measures adapted from the relevant scientific articles. Responses, except for those in the demographic information section, were rated on a 5-point Likert scale. The study used fictional product ads to minimize any real-world impact on participants' behaviour. The final version of the questionnaire was pre-tested to ensure its clarity and comprehensiveness. Informed consent was obtained from all participants, who were fully informed about the study's purpose, procedures, and their right to withdraw at any time.

Using Qualtrics randomization tools, a survey randomly assigned participants into either a control group or a time-scarcity one. Additionally, the order of promotions appearing in the survey was randomized to minimize the effects of survey fatigue (Porter et al., 2004). Hence, participants have seen promotions of all four products in a different order and with varying promotion conditions.

Data was collected over one month, with the survey distributed through various online platforms, and was subsequently analyzed using a combination of descriptive statistics, ANOVA, and regression analysis to test the research hypotheses. The methodology laid a solid foundation for exploring how time scarcity influences consumer behaviour, with insights that could inform both academic research and practical marketing strategies.

5 Research findings

This dissertation aims to investigate the effect of time-limited online promotions on the consumer behaviour of Generation Z. As this relationship is shaped by the intertwined influences of many consumers' internal and external factors, this study tried to predict and capture the most important ones. Specifically, data was collected in the context of four different products to check how the effectiveness of time-restricted promotions can be altered by the type of promoted product. Additionally, personal impulsiveness and interest in the product were added to the model to better understand consumer-related factors. These relationships were formulated in the form of hypotheses which were later tested through the analysis of the obtained data.

This chapter presents the description of the data collected via online survey together with its further analysis. It is structured in a way that reflects the logic of the hypothesis development, starting from a description of the sample and variables in use, which was followed by applying statistical modelling relevant to each hypothesis and drawing conclusions from the obtained results. The research findings provide valuable insights into the effectiveness of limited-time promotions when targeted at GenZ. They also shed light on the most important factors that affect purchase intentions.

5.1 Sample and variables description

A description of the key variables is provided in Table 5.1. Except for demographic information, responses were measured on a 5-point Likert scale, which explains the minimum and maximum value range of the data.

Table 5.1 Descriptive statistics of the key variables

Variable	Min	Max	M	SD
INT Interest in product	1	5	2.79	1.24
ARO1 Perceived Arousal	1	5	2.6	1.2
ARO2 Perceived Arousal	1	5	2.52	1.26
ARO3 Perceived Arousal	1	5	2.51	1.25
ARO Composite Perceived Arousal	1	5	2.54	1.18
IMP1 Personal Impulsiveness	1	5	2.19	1.14
IMP2 Personal Impulsiveness	1	5	2.16	1.15
IMP3 Personal Impulsiveness	1	5	2.12	1.09
IMP4 Personal Impulsiveness	1	5	2.67	1.24
IMP Composite Personal Impulsiveness	1	5	2.29	0.97
PI Purchase Intention	1	5	2.79	1.27

Notes: M = Mean; SD = Standard Deviation.

Before analyzing the data, the scales used to measure the constructs of the model had to be examined for their reliability and validity. Constructs Perceived Arousal and Personal Impulsiveness were measured using scales with three and four items respectively. Hence, before combining the scale items into composite scores for the constructs, a reliability and validity analysis was performed to assess the internal consistency and coherence in the representation of the mentioned latent variables.

Firstly, Cronbach's Alpha values were higher than 0.7 for both scales, suggesting good internal consistency among items of the scales (α (ARO1, ARO2, ARO3) = 0.959; α(IMP1, IMP2, IMP3, IMP4) = 0.859). Therefore, the reliability of the scales to measure Perceived Arousal and Personal Impulsiveness was confirmed.

Next, the Exploratory Factor Analysis (EFA) was conducted to test the validity of the study scales (Chan & Idris, 2017). For Perceived Arousal scale items, KMO was 0.767 suggesting the adequacy of the sample as its value was higher than the acceptable threshold of 0.6, while Bartlett's test ($\chi2$ = 3400.09, p < 0.001) indicated significant correlations between items. All items had communalities above 0.5, which means that a significant part of their variance was explained by the underlying construct. The first item had an eigenvalue of 2.751 and explained 91.708% of the total variance in the Perceived Arousal construct. Additionally, the component matrix reported high factor loadings above 0.7, meaning that all four items measure the same construct. Therefore, the validity of the Perceived Arousal scale was confirmed.

In the same manner, EFA was conducted to test Personal Impulsiveness scale. KMO and Bartlett's tests confirmed the adequacy of the sample for further analysis with significant correlations between scale items (KMO = 0.803, p < 0.001). The communalities of all four items were above the 0.5 threshold, and factor loadings – above 0.7, indicated a significant correlation between the scale items and the construct. The first extracted factor explained 70.67% of the total items' variance which proved the scale is unidimensional and measured a single construct. Therefore, Personal Impulsiveness scale was proved to be valid.

The sample of the study was composed of Generation Z with 272 participants in total. As stated in the research question, the main focus of this research project was to examine the effect of time-limited online promotions on the consumer behaviour of Generation Z exclusively.

Female participants prevailed in the sample composition (Females = 177; Males = 95; Figure 5.1). This might introduce sampling bias and decrease the generalizability of the findings. To address the sample imbalance, a new weight variable was created and applied to the analysis. This adjustment ensured that the research findings are robust and generalizable.

Collected data on participants' country of origin was grouped by continents and coded on a scale from 1 to 5, where 1 = Europe, 2 = Africa, 3 = Asia, 4 = North America, and 5 = Australia. This classification was applied to simplify the representation of the sample and facilitate further analysis. The biggest group consisted of individuals from Europe accounting for 51.10% of the sample, while the smallest group was from Africa with 2.84%. The distribution of the sample by continent of origin is displayed in Figure 5.2.
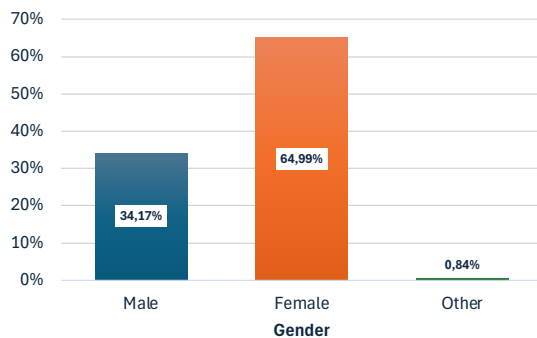
Figure 5.1 Sample distribution by gender
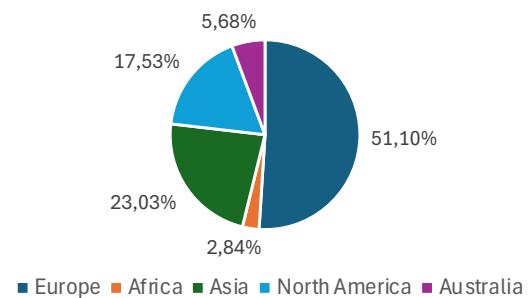
Figure 5.2 Sample distribution by continent

Participants observed and responded to questions related to all four products in varying order, each time being randomly assigned to either a limited-time experimental condition or a control group. The distribution between these conditions stayed relatively consistent across products (Table 5.2). As a result, every participant experienced both experimental conditions.

Table 5.2 Sample distribution by promotion condition across four product categories

Product	N	
	Control	Time Scarcity
Online library	157	162
Online retail (sneakers)	159	160
Online course	159	160
Flight tickets	154	165

5.2 Hypothesis 1

To test the first hypothesis (H1), which suggests that limited-time promotion leads to higher perceived arousal compared to a non-limited promotion, a One-way ANOVA was applied. The analysis started with the descriptive statistics presented in Table 4.3, which displayed the comparison of the means for individual perceived arousal items (ARO1, ARO2, ARO3) and a composite variable (ARO) across two experimental conditions: control promotion and time-

limited promotion. The means for Perceived Arousal in the time scarcity group were slightly, but consistently, lower than the means of the control group. However, the significance of these differences had to be confirmed in a further analysis of variance.

Table 5.3 Perceived arousal means by promotion condition

Variable	Condition	M	SD	SE	CI Lower	CI Upper
ARO1 Perceived Arousal	Control	2.60	1.20	0.05	2.49	2.70
	TS	2.52	1.22	0.05	2.41	2.62
	Total	2.56	1.21	0.04	2.48	2.63
ARO2 Perceived Arousal	Control	2.52	1.25	0.05	2.41	2.62
	TS	2.44	1.27	0.05	2.34	2.55
	Total	2.48	1.26	0.04	2.41	2.56
ARO3 Perceived Arousal	Control	2.50	1.25	0.05	2.39	2.61
	TS	2.43	1.26	0.05	2.33	2.54
	Total	2.47	1.25	0.04	2.39	2.56
ARO Composite Perceived Arousal	Control	2.54	1.18	0.05	2.44	2.64
	TS	2.46	1.20	0.05	2.36	2.57
	Total	2.50	1.19	0.04	2.43	2.57

Notes: TS = time scarcity; M = Mean; SD = Standard Deviation; SE = Standard Error; CI = Confidence Interval.

ANOVA revealed small F-ratios and p-values above the significance threshold of 0.05, which indicate no significant differences between limited time conditions and control groups' means (ARO1: $F = 1.148$, $p = 0.284$; ARO2: $F = 0.979$, $p = 0.323$; ARO3: $F = 0.762$, $p = 0.383$; ARO Composite: $F = 1.036$, $p = 0.309$; Table 5.4). Therefore, the null hypothesis of equal means in different promotion conditions is not rejected.

Table 5.4 ANOVA results for Perceived Arousal across Promotion conditions (H1)

Variable		Sum of Squares	df	Mean Square	F	Sig.
ARO1 Perceived Arousal	Between Groups	1.68	1	1.682	1.148	0.284
	Within Groups	1590.90	1086	1.465		
	Total	1592.58	1087			
ARO2 Perceived Arousal	Between Groups	1.55	1	1.551	0.979	0.323
	Within Groups	1720.04	1086	1.584		
	Total	1721.60	1087			
ARO3 Perceived Arousal	Between Groups	1.20	1	1.200	0.762	0.383
	Within Groups	1709.61	1086	1.574		
	Total	1710.81	1087			
ARO Composite Perceived Arousal	Between Groups	1.47	1	1.470	1.036	0.309
	Within Groups	1541.42	1086	1.419		
	Total	1542.89	1087			

Notes: df = Degrees of Freedom; F = F-value; Sig. = p-value

This suggested that a limited time frame of an online promotion did not generate greater arousal among the studied GenZ consumers when compared to non-limited. Therefore, Hypothesis 1 was not supported by the analysis.

5.3 Hypothesis 2

The second hypothesis suggests that the type of promoted product moderates the effect of limited-time promotion (TS) on Perceived Arousal. To check the validity of this hypothesis, the relationship between Time Scarcity and Perceived Arousal was examined across 4 different products using Two-way ANOVA. This approach allowed to see both the main and interaction effects of promotion condition and product type on Perceived Arousal and test the presence of the moderation effect of Product type.

As Table 5.5 reports, the interaction effect variable – Promotion*Product, had a low F-ratio (F = 0.601) and p-value exceeding a significance threshold of 0.05 (p = 0.615), indicating it is not statistically significant, alongside a small effect size represented by very low Partial Eta Squared measure (η_p^2 = 0.002). Consistent with the results of the H1 testing, time scarcity also did not have a statistically significant effect on Perceived Arousal (F = 1.620, p = 0.203, η_p^2 = 0.001). The results led to the conclusion that the type of the promoted product does not moderate the extent of arousal induced by limited-time promotion. Therefore, Hypothesis 2 was not supported by the analysis.

Table 5.5 ANOVA for Perceived Arousal by Product Type and Promotion Condition (H2)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	167.570	7	23.939	18.798	<.001	0.109
Intercept	6797.475	1	6797.475	5337.874	<.001	0.832
Promotion	2.063	1	2.063	1.620	0.203	0.001
Product	163.860	3	54.620	42.892	<.001	0.106
Promotion * Product	2.295	3	0.765	0.601	0.615	0.002
Error	1375.318	1080	1.273			
Total	8349.556	1088				
Corrected Total	1542.887	1087				

Notes: df = Degrees of Freedom; F = F-value; Sig. = p-value

Nevertheless, product type may not have the interaction, but it had a statistically significant main effect on the level of perceived arousal (F = 42.892, p = 0.001, η_p^2 = 0.106). Across four studied product categories, the online Flight ticket platform generated the highest perceived arousal (Table 5.6; M = 3.117, SE = 0.068), while the Online courses platform the lowest (M = 2.132, SE = 0.068). Additionally, Flight tickets was the only category where Mean arousal in the time scarcity group technically exceeded its counterpart from the control group (M(TS) = 3.129, SE(TS) = 0.098; M(C) = 3.105, SE(C) = 0.096). However, since the confidence intervals overlapped, this difference in means was not statistically significant.

Table 5.6 Comparison of Perceived Arousal across four product categories

Product	M	SE	CI Lower	CI Upper
Online library	2.210	0.068	2.075	2.344
Online retail (sneakers)	2.542	0.068	2.407	2.676
Online course	2.132	0.068	1.997	2.266
Flight tickets	3.117	0.068	2.983	3.252

5.4 Hypothesis 3

The third hypothesis suggests that already existing personal interest in a promoted product can strengthen the effect of limited-time condition on consumer's perceived arousal after seeing the promotion. This hypothesis was tested using the same method that was applied to the second hypothesis, specifically a two-way ANOVA. Before performing the analysis, a new Interest variable was created by grouping the responses given on the 5-point Likert scale into 3 categories corresponding to the level of interest (low, medium, high).

Table 5.7 ANOVA for Perceived Arousal by Interest and Promotion Condition (H3)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	961.430	5	192.286	357.814	<.001	0.623
Intercept	7288.830	1	7288.830	13563.367	<.001	0.926
Promotion	0.466	1	0.466	0.868	0.352	0.001
INT_L	958.760	2	479.380	892.051	<.001	0.622
Promotion * INT_L	1.273	2	0.636	1.184	0.306	0.002
Error	581.457	1082	0.537			
Total	8349.556	1088				
Corrected Total	1542.887	1087				

Notes: Dependent variable: ARO Composite Perceived Arousal; INT_L = Interest in product; R^2 = .623 (Adjusted R^2 = .621);

On the one hand, the test results reported that Interest has a statistically significant main effect on Perceived Arousal (F = 892.051, $p < 0.001$, η^2 = 0.622). The means comparison revealed that the higher the interest in the promoted product, the higher the perceived arousal (Table 5.7). This implied that those highly interested in the product respondents had experienced significantly higher arousal after observing the promotion compared to those less interested. This tendency held for both control and time-limit promotional conditions.

On the other hand, the moderating effect of interest received the opposite results. This interaction was represented by the Promotion*INT_L variable. Its p-value equals .306, which was bigger than 0.05, and a small F value did not indicate the statistical significance of the

interaction effect. Reported results deny the existence of a moderation effect of Interest on the Perceived Arousal under TS promotion conditions. Therefore, Hypothesis 3 is not supported.

Table 5.8 The average level of Perceived Arousal by Promotion condition and Interest

Promotion condition	Interest level	M	SD
Control	Low	1.59	0.67
	Medium	2.64	0.73
	High	3.74	0.88
	Total	2.54	1.18
Time Scarcity	Low	1.45	0.60
	Medium	2.63	0.77
	High	3.75	0.79
	Total	2.46	1.20

Notes: DV: Perceived arousal; M = mean; SD = Std. Deviation

5.5   Hypothesis 4

The fourth hypothesis suggests that Perceived Arousal has a positive effect on Purchase Intention. This hypothesis was tested using linear regression as both variables were considered continuous.

The model reported a strong and positive correlation between perceived arousal and purchase intention as Pearson's Correlation Coefficient (r = 0.828) was higher than the 0.5 threshold. The Coefficient of Determination indicated that 68.6% of the variance in the purchase intention was explained by perceived arousal (R^2 = 0.686). The regression model was statistically significant confirming perceived arousal as a significant predictor of purchase intention (F = 2372.063, $p < 0.001$). These results were further supported by the unstandardized Coefficient (B = 0.889, $p < 0.001$), which indicated that for every one-unit increase in perceived arousal, purchase intention went up by 0.889 units. So, the effect of Perceived Arousal on Purchase intention was meaningful and statistically significant (t = 48.704, $p < 0.001$).

Therefore, the regression analysis supports Hypothesis 4, concluding that higher perceived arousal among respondents leads to higher purchase intention.

5.6   Hypothesis 5

The last hypothesis suggests that Personal Impulsiveness moderates the effect of perceived arousal on purchase intention. To test the validity of this hypothesis, moderation analysis was conducted using multiple linear regression. Before running the analysis, the interaction term was created to capture the combined effect of Perceived arousal and personal impulsiveness represented in the model by ARO*IMP.

The resulting model had a substantial determination coefficient ($R^2 = 0.686$), which could be mainly explained by the inclusion of Perceived arousal that proved to be a significant predictor of Purchase Intention (H4). The interaction effect of ARO*IMP on the Purchase Intention was very small (B = 0.013) and not statistically significant (t = 0.706, p = 0.481). It indicated that Personal Impulsiveness did not moderate the relationship between Perceived arousal and purchase intention.

Despite the statistical significance of the model (F = 790.220, p < 0.001), it revealed no interaction effect. Hence, Hypothesis 5 was not supported by the findings.

Table 5.9 Linear regression for testing the moderating role of Personal Impulsiveness (H5)

| Variables | Unstandardized | | Standardized | | |
	B	SE	Beta	t	Sig.
(Constant)	0.55	0.12		4.51	<.001
ARO Composite Perceived Arousal	0.86	0.05	0.8	18.84	<.001
IMP Composite Personal Impulsiveness	-0.02	0.05	-0.012	-0.33	0.734
ARO x IMP	0.01	0.02	0.039	0.71	0.481

To provide additional insights into the relationships between variables that might have been missed in the previous analysis, the Multilayer Perceptron (MLP) model was applied. MLP can capture complex and non-linear connections between the independent variables and the dependent variable, which provides a deeper understanding than the traditional linear regression analysis.

The model confirmed previous findings indicating Perceived Arousal as a dominant factor influencing Purchase Intention within the defined variables set (Table 5.10). To facilitate the interpretation of the variables' predicting power, their importance was scaled in relation to Perceived Arousal which was set as 100%. This enables the comparison of their normalized importance. So, the second variable by the impact was Interest in the product with 63.8% normalized importance. Other variables were significantly less important, with the type of promotion being the least influential factor (3.7%) when compared to Perceived Arousal.
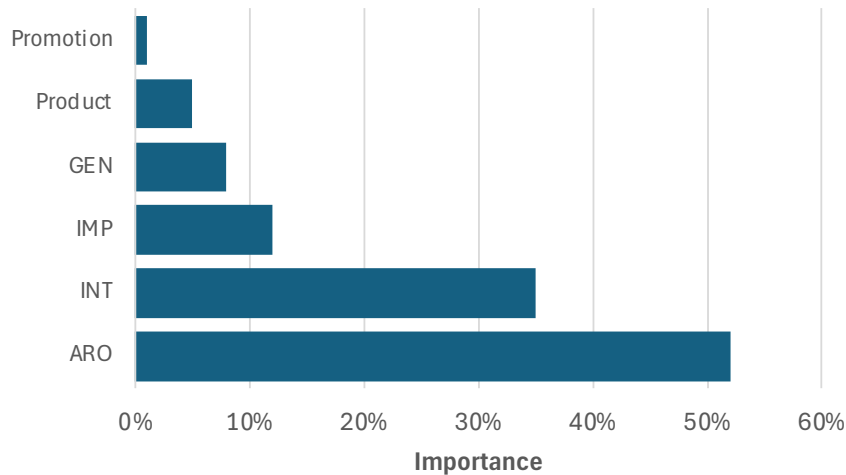
Figure 5.3 Independent variables' importance in predicting Purchase Intention

In conclusion, the limited-time condition did not change the perception of the promotion and further purchase intentions in the studied Gen Z sample. It turned out to be the least significant factor of influence defining purchase intention. Meanwhile, the type of product had a meaningful impact on the level of experienced arousal. Across four studied products, flight tickets generated significantly higher perceived arousal and subsequent purchase intentions compared to other products, with online courses being the least engaging product for Gen Z. The presence of interest in a promoted product led to a higher perceived arousal after observing a promotion, which in turn, was the most important factor influencing purchase intention. This established a linear relationship where a higher emotional reaction to promotion led to a higher intention to buy. Meanwhile, personal impulsiveness showed neither a main nor interactive effect on purchase intention. Therefore, four out of five hypotheses were rejected based on the conducted analysis.

The research findings offer opportunities for discussion and deeper reflection on both confirmed and not confirmed relationships between the constructs. These findings further enrich our understanding of a widely used online marketing tactic – limited-time promotion – and its specific performance when targeted at Gen Z.

6   Discussion

In this chapter, the research findings are used to answer the research questions that guided the development of this dissertation. These insights are compared to the relevant scientific articles to locate the research within an existing theoretical context and demonstrate its contribution to understanding the effectiveness and constraints of time-limited online promotions, particularly within the Gen Z consumer segment.

Addressing the first question (RQ1) regarding the way time-limited online promotions affect Gen Z's purchasing behaviour compared to non-limited, the research found that time scarcity may be relatively ineffective in driving purchasing behaviour in the Gen Z consumer segment. The data didn't show a significant difference in the perceived arousal and subsequent purchase intentions between the time-scarcity experimental condition and the control group. These results suggest that the presence of a time limit does not change consumers' perception of a sales promotion.

Based on the reviewed theoretical frameworks, perceived arousal was selected as a mediating factor between time-limited promotion and purchase intention to represent an underlying psychological reaction that drives and explains the purchasing behaviour of Gen Z (RQ2). The analysis results prove that perceived arousal is a significant predictor of purchase intentions, explaining 68.6% of its variance (H4). The higher is the emotional reaction to promotion, the higher is the likelihood of the purchase. So, these results suggest that exploring the influence of promotions on purchasing behaviour through the lens of perceived arousal is relevant and appropriate. Yet, consistent with the first finding, time scarcity did not influence an emotional response to promotion, since there was no difference in level of arousal between TS and control experimental conditions. Therefore, the collected data states that time scarcity also does not increase participants' purchase intentions for a promoted product either directly or indirectly through the mediating role of perceived arousal.

The observed results are consistent with a recent study conducted by Hmurovic et al. (2023), which claims that, contrary to expectations, time-scarcity online promotions do not bring as robust results as they proved to have in an offline context. In their simulation of an online shopping experience, the time limit did not boost purchase intentions compared to a control promotion with no explicit time restrictions. Researchers explain the results by activation of persuasion knowledge – consumers' awareness and response to persuasive tactics, which makes the time-limited promotion seem less authentic (Hmurovic et al., 2023). This explanation may also clarify the findings of this study, as Gen Z is known to be particularly

familiar with digital marketing tactics, contributing to their scepticism regarding the underlying motivation behind scarcity messages in online promotions (Salam & Pratiwi Ar, 2024).

On the other hand, our findings contradict the positive effects of time-limited online promotions on consumer behaviour reported by other prior research (Wu et al., 2021; Broeder & Wentink, 2022; Lamis et al., 2022; Khetarpal & Singh, 2024). The observed contradiction invites a deep reflection on the possible causes of the results' differences which will further advance our understanding of the time scarcity mechanism in an online setting.

In our research, the effects of limited-time promotions were studied using the stimulus for four different online retail platforms to investigate how the type of promoted product can influence Gen Z's perception and response to the promotional campaign (RQ3). The results did not show a moderating effect on the relationship between limited-time messages and the extent of perceived arousal, since its existence was not supported by the analysis. However, product type was found to have an important role in defining how responsive consumers would be to the promotion. Findings suggest that products associated with pleasure, personal fulfilment, or memorable experiences, in this study represented by online travel services, tend to evoke stronger emotional responses compared to products offering functional or practical benefits such as educational or professional resources. The emotional significance of these products creates a natural sense of excitement and arousal, regardless of any scarcity pressure.

Additionally, the prior interest in an offered product was reported to contribute to Gen Z's responsiveness to the promotion disregarding the experimental condition (RQ4). The pre-existing interest in a product makes consumers more responsive to promotions and induces emotional reactions. Therefore, seeing a promotion for a product of interest generates an emotional response simply because the product aligns with consumers' desires or plans, irrespective of how long the offer lasts. Therefore, this study defines product type and prior interest as important factors influencing the level of perceived arousal and further purchase intentions within the Gen Z consumer segment.

Lastly, consistent with Wu et al. (2021), the results suggest that there is no moderating effect of impulsiveness level on the relationship between time scarcity and Gen Z's purchase intention. This implies that personal impulsiveness of Gen Z does not influence their decision-making under limited-time promotion conditions (RQ5). On the one hand, this result can be explained by the fact that personal impulsiveness as a trait is hard to capture through a self-report survey in a hypothetical setting (Rook & Fisher, 1995). Impulsive behaviour is context-triggered (Dholakia & Kimes, 2011), while online surveys could not include the environmental factors that evoke this behaviour during the real-world online shopping experience. On the

other hand, the absence of a moderating effect might be caused by the low to moderate baseline impulsiveness reported by survey participants (Table 4.1; Wu et al., 2021).

Answering the research question of this study, the findings suggest that online time-limited promotions might not be effective when targeted at Generation Z. This conclusion contradicts the positive results observed in the prior empirical studies, highlighting the need to understand which factors and contexts have caused these discrepancies in research findings.

After a thorough analysis of the methodological approaches in studies reporting the positive effects of time scarcity on consumer purchase behaviour in the online shopping context, some important discrepancies were identified. First and the most important overarching distinction is that these studies are geographically and culturally limited. Their data was collected from participants of the same nationality, overlooking the potential impact of socio-cultural factors on the decision-making process (Brewer & Venaik, 2014; Torelli et al., 2024). Except for one, all studies were conducted in Asia, specifically in China, Indonesia, and India. The observed consumer behaviour in response to limited-time online offers might not hold for individuals from different cultural contexts. In contrast, data for our research was collected from participants from different countries and continents representing a more culturally diverse and realistic online shopping environment (see Figure 5.2). The broad reach of this study sample enhances the generalizability of the findings, limiting the risk of cultural bias (Moss & Vijayendra, 2018; Wiernik et al., 2022). Meanwhile, Broeder and Wentink (2022), based on a sample with 139 Dutch and 92 Italian participants, reported an indirect positive effect of time scarcity on purchase intention only among individuals from Italy. This finding, together with the contradiction in results obtained in our research and other studies conducted in Asia highlights the important role of socio-cultural factors in defining the relationship between time-limited promotions and consumer behaviour in the online context.

Secondly, Song et al. (2021) conducted an experiment employing only the time-scarcity condition, omitting the comparison with a control group. That is why the reported positive influence cannot entirely be attributed to the presence of a restricted time frame. In contrast, our study randomly assigned participants in either a time-scarcity or control experimental condition, allowing us to isolate and study the effect of the time limit on consumer behaviour more accurately (Wilson, 2021).

Thirdly, there is a difference in sample composition, as our study specifically targeted Gen Z disregarding their occupation, while the studies with reported positive effects of time scarcity mostly relied on university students. Such a homogeneous sample composition might not be

representative of a more diverse population of online shoppers, limiting the applicability of the findings to the real-world online retail environment (Peterson & Merunka, 2014).

The underlined methodological differences are believed to be the main cause of the contradicting results regarding the influence limited-time promotions have on consumer behaviour in an online environment. However, some factors may have been overlooked. For example, the comparison of stimulus material was not possible as few studies provided the visuals used for their data collection. The differences in how time limits were presented in terms of intensity, colour, or placement in the survey stimulus might have impacted the perception of scarcity and, consequently, consumer response.

Lastly, the results suggest that Generation Z, as a specific consumer group, may be less responsive to scarcity appeals in online retail settings. Being the first fully "digital native" generation, the online purchasing behaviour of Gen Z is greatly defined by their constant exposure to the digital world, which can explain the developed resistance to currently widespread limited-time offers (Salam & Pratiwi Ar, 2024).

6.1 Theoretical contribution

Since the empirical evidence of the effectiveness of time-limited promotions in an online context is scant compared to the offline setting, this dissertation aimed to address this knowledge gap by conducting experimental research while also testing the effect of several proposed moderating variables.

Hmurovic et al. (2023) point out the need for ongoing research and exploration of limited-time promotions' effectiveness in an online context, which this dissertation met by studying the online time scarcity influence on consumer behaviour of Gen Z. By focusing on digitally savvy Gen Z, research obtained generation-specific insights acknowledging the suggestion of Ladeira et al. (2023) for exploring the time scarcity effects across different generational cohorts.

From a theoretical perspective, this study contributes to the existing literature on time-scarcity promotions by adapting the competitive arousal model as a mediating variable between time-scarcity promotion and purchase intention (Ku & Adam, 2022). We suggest that the stimulated and aroused emotional state described in this model can have multiple causes beyond the competitive context, such as urgency or pressure introduced by limited-time promotions. Hence, to better fit the context of this study and avoid confusion with competitive factors, this study refers to the mentioned emotional state as perceived arousal, similar to Wu et al. (2021). This approach highlights versatility of the context in which competitive arousal can be applied.

Additionally, the inclusion of two moderating variables – prior interest in a promoted product and product type – was motivated by the need to explore new elements and extend the foundation for understanding of the time scarcity moderators (Ladeira et al., 2023). Their inclusion enhanced the quality of the research model and contributed to a more nuanced understanding of the factors influencing consumers' response to online scarcity promotions and subsequently, greatly increased its predictive power in determining purchase intentions. These variables provided a new perspective on the causes of emotional reactions that shape purchase behaviour, extending beyond linear connection to the presence of time scarcity. The first construct representing consumers' prior interest in a promoted product addresses the future research suggestion of Lee et al. (2018) which highlighted the need to study the influence of consumer background experience with a product. Prior interest was reported to have a significant impact on the level of perceived arousal, implying that emotional reactions are highly driven by the relevance and personal significance of the promoted products. This leads to a suggestion that time scarcity promotions cannot provide universally similar results, as their effect is greatly reliant on consumers' preferences that shape their response.

Next, this study experimented with the inclusion of a product type variable, addressing the existing knowledge gap by exploring time scarcity effects across different product categories (Shi et al., 2020; Hmurovic et al., 2023; Ladeira et al., 2023). The findings revealed that in an online context, products associated with personal fulfilment and enjoyable experiences, represented by air travel services, generated greater perceived arousal than products offering practical benefits, like educational and professional online resources. This insight points out the conditions under which time-scarcity promotions might be more effective. This observation challenges the established practice of studying time-scarcity promotional strategies on a specific product and then generalizing the results across all markets, highlighting the variability of the results depending on the application context.

Lastly, this study challenges the generalizability of the prior empirical evidence (Wu et al., 2021; Broeder & Wentink, 2022; Lamis et al., 2022; Khetarpal & Singh, 2024), by highlighting the important role of participants' cultural background, which can make the results' applicability limited to the cultural context of the conducted study (Wiernik et al., 2022). Thus, the research model aimed at studying the effect of time scarcity should account for the socio-cultural factors that can predetermine the results of the study due to the ingrained differences in purchasing behaviour among consumers from different cultures (Torelli et al., 2024).

6.2 Practical implications

Since Gen Z was reported to be relatively irresponsive to time-limited online promotions, businesses targeting this consumer segment should reconsider their over-reliance on time pressure as a driving force for boosting their sales. Instead, they should seek ways to appeal to this group in more meaningful and personalized ways, making a transition from urgency to emotional resonance as an anticipated effect of the promotion. Our results report that pre-existing interest increases positive responses to sales promotion by driving purchase intention via the mediating role of perceived arousal. Therefore, tailoring promotions to align with Gen Z consumers' interests and aspirations may bring better results in terms of engagement and purchase intent.

Nevertheless, time scarcity tactics might still be effective when targeted at preceding generational groups. Unlike Generation Z, other consumer groups might be less skeptical of the underlying intentions behind promotions due to having less experience with digital persuasive tactics (Salam & Pratiwi Ar, 2024). This implies that consumer segmentation should account for differences in digital experience.

Findings regarding the influence of socio-cultural factors on the effectiveness of online time-scarcity promotions, such as the observation that Western consumers are generally less responsive to urgency-inducing tactics than their Asian counterparts, suggest that companies operating globally should diversify and finetune their promotional strategies to align with the specific cultural and geographic contexts of application.

Generally, our findings suggest that the current overexposure to urgency-inducing tactics made consumers tolerant and resistant to these promotional appeals, no longer bringing the intended results, particularly within the Gen Z consumer segment (Alba et al., 1999). Since both quantity and time-related scarcity tactics have been widely employed by online retail platforms, this might have caused the saturation effect, as consumers are repeatedly exposed to the same marketing appeals (M. Schweizer & Hirsh, 2005). This constant exposure to scarcity tactics diminishes their ability to galvanize emotional reactions and purchase intentions. Gen Z consumers could have already adapted to the ever-present flash sales, countdown timers, and limited-time offers, and perceive them as an integral part of their online shopping experience. Thus, online retailers relying on these persuasion techniques should reconsider the frequency of their use and look for more personalized ways of their application, appealing to consumer-specific interests and aspirations.

To sum up, through a refined theoretical framework accounting for moderating effects of consumers' prior interest and product category, this research revealed relative ineffectiveness of time-limited online promotions in driving arousal and purchase intentions in the Generation Z consumer segment. This finding challenges the existing literature, pointing out the differences in methodological approaches that could have caused these contradictions. Moreover, the reflection on these contradictions revealed an important role of sociocultural and generational factors in defining consumers' responsiveness to urgency-inducing online appeals. Generally, this study suggests that the tested approach to time-scarcity application may already be outdated, which highlights the need for continuous refinement of promotional strategies to keep up with consumers' adaptive tendencies and evolving expectations.

7 Conclusion

This dissertation explored a timely and relevant topic – the efficacy of time-limited online promotions within the Gen Z consumer segment. Despite the widespread application of time scarcity across various online platforms, the empirical evidence on its effectiveness and factors that moderate its influence on consumer behaviour is limited. Addressing the identified knowledge gaps, this thesis developed a research model incorporating relevant theoretical concepts alongside suggested moderating variables like prior interest in a product and product category, pursuing the goal of capturing the effect of time-limited online promotions on Gen Z consumer behaviour. The proposed moderators significantly contribute to understanding and predicting the time scarcity performance in an online environment.

This study significantly contributed to both theory and practice, pointing to the Gen Z resistance to time scarcity and the need to reconsider the existing approach to TS utilization. Additionally, the results highlight the important role of socio-cultural factors in influencing consumer response to time pressure in online promotions. We suggest ways to tailor time-scarcity tactics to young, digitally savvy consumer segments by focusing on emotional engagement and personal relevance of promotions.

Later in this chapter, we provided practical recommendations for online businesses and retailers on how to extract positive results from time scarcity by leveraging the cutting-edge technological powers offered by Artificial Intelligence.

Concluding the study on time scarcity's potential in galvanizing purchasing behaviour within the Gen Z consumer segment, we acknowledge several limitations to the employed methodology along with avenues for future research on limited-time promotions.

Recommendations

This study offers several practical recommendations on how to increase the effectiveness of time-limited promotions in an online setting, particularly by applying innovative solutions powered by Artificial Intelligence (AI).

Firstly, the results highlight the need to reconsider the overreliance on generic time-scarcity sales promotions that have saturated the online retail environment. According to the research findings, these promotions may be relatively ineffective at generating emotional reactions and driving subsequent purchase intentions, especially when targeting Gen Z. Instead, companies are likely to achieve better results from their time-scarcity campaigns, if they shift the focus

from the time frame itself to the personal value offered in the promotion, incorporating the time limit as a supporting feature rather than a primary.

The integration of AI into marketing processes is expected to increase the positive results of time-scarcity promotions in online retail. Specifically, AI-powered advanced data analytics tools offer valuable insights into consumers' preferences, interests, and behaviour patterns, based on accurate analysis and interpretation of consumers' activity on the platform, browsing, and purchasing history (Kumar et al., 2024). With this knowledge, companies can better understand their customers and conduct more precise segmentation. These insights set the stage for the development of highly personalized marketing strategies tailored to the specific needs and desires of customers. Hence, we suggest that time-scarcity promotions should be based on personalized, data-driven strategies, rather than broad, one-size-fits-all approaches.

Empowered by AI, companies can automatically promote specific products or product categories that a customer is interested in, which, as this study suggests, increases emotional arousal and purchase intentions. Online retailers can benefit from this practice by appealing to their diverse customer base in a more personalized, authentic way, not feasible without AI.

Additionally, online retailers may consider offering personalized discounts applied only to the products in a customer's wishlist and for a period of less than one day. Prior research suggests that purchasing behaviour accelerates closer to the promotion expiry but does not appear earlier than 24 hours before the end (Hmurovic et al., 2023).

it is also recommended to provide a consumer-related justification for a time limit based on the identified consumer interests and preferences (Hmurovic et al., 2023). The inclusion of a personalized justification for time-limited promotion will make it look more authentic and genuine, decreasing the activation of persuasion knowledge, which is believed to contribute to Gen Z's tolerance of time-scarcity appeals (Weathers et al., 2015).

Moreover, AI may track consumer activity on the platform and adjust promotions accordingly. For instance, when detecting repeated visits to a product page, AI can initiate a unique time-limited promotion that might persuade customers to make a purchase, as they have already shown signs of interest – a significant determinant of purchase intentions.

Finally, AI-powered A/B testing can provide valuable insights regarding the most effective approach to use time scarcity, identifying the appropriate timeframe, discount size, and messaging strategies to appeal to the target audience.

Limitations

The results of this study rely on self-reported data, which might be susceptible to a response bias (Rosenman et al., 2011). Specifically, when measuring personal impulsiveness, social desirability bias could have influenced the given responses, as impulsive behaviour may be seen as a negative trait. Despite the anonymous mode of participation in the survey, participants may have unintentionally provided inaccurate responses, desiring to be seen in a more favourable light.

The experimental design developed to study time-scarcity effects in an online setting may not evoke the same consumer reaction that would appear in a real-world online shopping environment. The static fictional illustrations of retailers' websites lack interactivity and dynamic features that drive consumer engagement with the platform and offered products. Therefore, the results might not fully reflect consumer response to time pressure in real-life online shopping.

Given that the focus of this research lies on Generation Z, this limits the generalizability of the findings to other generations, which may display different behaviours and responses to time-scarcity appeals in an online context.

Future research directions

Most of the empirical evidence on the online time-scarcity effects was obtained through simulations and scenario-based surveys. These methodological approaches bring important theoretical insights, yet do not fully capture the effects of different factors present in a real online shopping environment, such as interface, navigation, brand perception, and others. That is why future research would greatly contribute to the understanding of the time-scarcity effects and its moderators by conducting a field experiment via collaborating with online retailers and running curated promotional campaigns.

Another important avenue for future exploration is the role of socio-cultural factors. The interpretation of our research findings in the context of existing literature on time scarcity performance online has revealed significant variation in consumer responses to TS promotions based on their cultural background. This observation signals the need for further investigation and interpretation of time-scarcity influence on consumer behaviour across different cultural and social segments. A particularly interesting direction would be to identify the culture-specific factors that predefine consumers' reactions to time-scarcity appeals.

As suggested by (Hmurovic et al., 2023) the time-scarcity effect on consumer behaviour may be moderated by the activation of persuasion knowledge. To accurately capture its presence and role in consumer decision-making under time pressure, future research will need to conduct qualitative in-depth interviews, as the existing measurement approach likely introduces bias to the study by priming consumers to respond more sceptically.

Additionally, more research is needed on the distinctive online behaviour of Gen Z, specifically factors that contribute to their resilience to time pressure and ways to impose time limits in a more meaningful way, providing marketing practitioners with guidelines on the optimal application of time scarcity to the Gen Z consumer segment. It would also be interesting to conduct a direct comparison with Millennials, acknowledging the role of digital literacy in the perception of online time scarcity tactics. Furthermore, future research could also explore how different TS justifications influence Gen Z responsiveness to promotions with time limits in an online context. Particularly the focus may lie on the effect of personalization in this relationship, which is anticipated to lower persuasion knowledge activation and make promotion seem more authentic.

Another future research avenue is the investigation of consumers' responsive behavioural patterns regarding the anticipated promotion frequency, as consumers might have already accepted the ever presence of scarcity promotions in online retail and adapted certain patterns of behaviour to respond and take advantage of them.

Finally, future studies should consider using a more diverse sample, extending the data collection period, and exploring additional variables that could influence the effectiveness of scarcity promotions. Addressing these limitations will help refine the understanding of how scarcity affects consumer behaviour in various contexts.

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