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CHOICE OVERLOAD, DECISION FATIGUE & IMPULSIVE BUYING IN ONLINE SHOPPERS

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ABSTRACT

This study investigated the relationships between Choice Overload, Decision Fatigue and Impulsive Buying in Online Buyers. Using a quantitative correlational cross-sectional research design, data were collected from N=200 participants aged 18 to 40 years through purposive sampling technique. The study employed the Choice Overload Scale (Manolică et al., 2021) to assess perceived choice overload, the Decision Fatigue Scale (Hickman Jr., 2018) to measure levels of decision fatigue, and the Consumer Impulsive Buying Tendency Scale (Uygur, 2018) to evaluate impulsive buying tendencies. Data analysis was conducted using Statistical Package for Social Sciences (SPSS) version 23, including descriptive statistics, Pearson Product-Moment Correlation, hierarchical regression analysis, mediation analysis and independent sample t-tests. The findings revealed a significant positive relationship between choice overload, decision fatigue and impulsive buying tendencies. Choice overload positively predicted impulsive buying tendencies, while decision fatigue also emerged as a significant predictor. Furthermore, decision fatigue partially mediated the relationship between choice overload and impulsive buying. Age and Income were not significant predictors of impulsive buying. Males scored significantly higher on impulsive buying behavior than females, while no significant gender differences were found in choice overload and decision fatigue. Ethical considerations, including informed consent, confidentiality, and voluntary participation, were strictly maintained throughout the research process. The findings highlight the importance of managing excessive online product choices and reducing decision fatigue to minimize impulsive buying behaviors among consumers. Future research may explore additional psychological and environmental factors influencing online purchasing behavior using longitudinal and experimental designs.

Introduction

The tremendous growth of ecommerce has significantly influenced the buying behaviors of the consumers, making everything more convenient, accessible and more visible to a wide variety of products. Recent research, however indicates that these types of digital environments that are rich with information can also result in cognitive overload, decrements in decision quality and purchases that are more impulsive (Lina et al., 2022; Zhao et al., 2022). Impulsive buying refers to the tendency to purchase items based on impulse or whims which has gained increasing prevalence in the digital realm where consumers are constantly bombarded with promotional cues and purchasing processes are streamlined (Kumar, 2024). Moreover, the psychological factors like choice overload and decision fatigue have been

observed to adversely affect self-regulation and increase impulsive responses. While there is growing interest in consumer behavior in the online environment, there is still a lack of empirical research in a developing context and more research is needed in these underlying mechanisms.

Choice overload refers to the decline in decision quality, confidence, and satisfaction that occurs when individuals are faced with too many options (Iyengar & Lepper, 2000). In online shopping environments, this effect is amplified by multiple decision layers such as product variations, pricing, delivery options, discounts, and customer reviews, all of which increase both the volume and complexity of information. Importantly, choice overload is shaped not only by the number of options but also by product complexity, conflicting information, and decision uncertainty, which can exceed an individual's cognitive capacity (Shah & Wolford, 2007). When this occurs, consumers may delay decisions, avoid purchasing, or resort to impulsive buying to reduce cognitive effort. Overall, choice overload in digital contexts is a multidimensional phenomenon that affects cognition, emotions, and behavior, often leading to anxiety, regret, emotional exhaustion, and outcomes such as cart abandonment or impulsive purchases, highlighting the combined influence of individual and environmental factors in online decision-making (Shah & Wolford, 2007).

Decision Fatigue is a psychological and cognitive effect that causes an individual to lose their ability to make effective decisions after having to analyze many options. Human cognitive and self-regulatory capacities are finite and deplete with constant use (Baumeister et al., 1998). These resources are heavily utilized in online shopping environments that are complex in terms of the number and diversity of items, the number and complexity of product attributes, algorithmic product recommendations, social cues and time sensitive promotions. This leads to heightened mental exhaustion and emotional stress and a higher risk of impulsive or poor buying decisions (Kumar, 2024).

Decision fatigue occurs when cognitive, emotional, and self-regulatory resources become depleted after prolonged or repeated decision-making. Processing multiple alternatives, product attributes, and social cues places a heavy burden on working memory and executive functioning, reducing individuals' ability to plan, focus, inhibit impulses, and evaluate options effectively (Sweller, 1988).

Decision fatigue in online shopping is intensified by excessive choice, complex product information, algorithmic recommendations, social influences, and time-limited promotions, all of which increase cognitive load and shape consumer purchasing behavior (Canarslan, 2025). Impulsive buying refers to unplanned, spontaneous purchases driven by immediate feelings rather than deliberate evaluation, and is increasingly common in online environments due to platform design features and promotional strategies (Rook, 1987). It is influenced by both internal psychological processes and external environmental cues, making it a systematic rather than random behavior (Li, Zhang & Chen, 2023).

Neuroscientific evidence suggests that impulsive purchasing is linked to activation of reward-related dopaminergic systems, which reinforce pleasurable anticipation and immediate gratification (Knutson et al., 2007). In digital marketplaces, design elements such as gamification, personalization, algorithmic recommendations, and urgency cues (e.g., countdown timers and limited-time offers) further stimulate reward mechanisms and reduce cognitive deliberation, thereby increasing impulsive buying tendencies (Coley & Burgess, 2003).

Theoretical Framework

This study examines the relationship between choice overload, decision fatigue and impulsive buying amongst online shoppers based on two complementary theories, the Paradox of Choice (Schwartz, 2004) and Ego Depletion or Self-Regulation Theory (Baumeister & Heatherton, 1996). These frameworks together describe the interaction between environmental stimuli,

internal cognitive processes and behavioral outcomes in digital consumer environments.

The Paradox of Choice theory proposes that too many choices can actually overwhelm consumers, resulting in stress, indecision and dissatisfaction, whereas some choice can be beneficial for consumers, as it increases their sense of autonomy and their satisfaction (Schwartz, 2004). For example, online shopping platforms offer a wide variety of products, categories and promotions that are constantly changing and can be considered as stimuli in the environment that raises the cognitive load (Iyengar & Lepper, 2000). This increased complexity can lead to decision fatigue which means that the quality of consumer decisions is diminished (Baumeister et al., 1998). This means that consumers can make decisions based on heuristics or emotional responses, which can lead to impulsive buying. The theory from a consumer psychology point of view focuses on the connection between environmental stimuli, cognitive load, emotional response and behavior (Chernev, 2003).

This perspective is supported by Ego Depletion or Self-Regulation Theory which suggests that self-control is a limited resource (Baumeister et al., 1998). This resource is depleted when people have to make a decision repeatedly and so their ability to self-regulate is reduced (Muraven & Baumeister, 2000). When consumers repeatedly make complicated decisions, algorithmic recommendations and time-sensitive offers can compound cognitive depletion in an online shopping environment (Vohs et al., 2008). Consumer self-regulatory depletion can increase the likelihood of impulsive buying due to their inability to think or to inhibit their immediate impulses (Dahl et al., 2003). This theory offers the psychological process that connects choice overload with impulsive behavior and how internal resource depletion can lead to consumer behavior (Faber et al., 2004).

Combining these two theories provides a complete picture, choice overload is the external catalyst that adds to cognitive and emotional burden, decision fatigue is the internal state of depleted resources and impulsive buying is the behavioral reaction (Shiv & Fedorikhin 1999). These frameworks collectively help to illustrate the ways in which online shopping environments influence consumer behavior via environmental complexity and internal cognitive constraints and to directly support the study hypotheses that choice overload, decision fatigue and impulsive purchasing tendencies are interrelated.

While there has been an increased interest in online consumer behaviour, little research has focused on the interplay between choice overload, decision fatigue and impulsive buying in online shopping environments. The majority of studies have focused on one of these factors individually or in an offline setting (Schwartz, 2004; Yuxin, 2024). The abundance of options and information overload in e-commerce can lead to decision fatigue, impairing consumers ability to make thoughtful decisions and potentially resulting in impulsive purchases (rellati.com, 2025; Zhao et al., 2022). Hence, the combined effects of excessive choice, information complexity and cognitive strain on impulsive buying behavior of online shoppers needs to be explored. It is important to understand the relationship between these factors, not only to improve theoretical knowledge of consumer decision making process but also for the development of effective ecommerce strategies and marketing practices (Electronic Commerce Research and Applications, 2012).

Literature Review

According to Koukova & Bergh (2021), Information overload is closely related to choice overload and has a significant impact on impulsive buying behaviour. Overabundance of product information, promotions and user-generated content leads to cognitive overload and thus consumers resort to heuristic and automatic decision processes.

Wang, Mo & Ho (2023) reported that prolonged decision making is found in online contexts and this causes choice fatigue, which influences the decision-making strategy. The researchers were able to determine that participants were using more and more heuristics and shortcuts, including favoritism for the first presented options, as they

repeated their choices in the controlled experimental designs. As cognitive resources decreased, analytical processing also decreased leading to simplified and satisficing decisions. This pattern is indicative of cognitive depletion and is one of the reasons why individuals can be impulsive or may make less optimal decisions when exposed to more complex choice context for a prolonged period.

Hauser, Meyer & Klein (2023) reported that survey data at the large scale confirms the interplay of choice overload and decision fatigue with impulsive buying in various online marketplaces. The study employed structural equation modelling to analyze the answers of over 2500 online consumers in Europe and North America and found evidence that raising product quantity and similarity had a significant impact on cognitive load. This heightened cognitive work in turn strengthened the current inclination towards impulsive buying, especially for those who had a high trait impulsivity. The results also showed that perceived ease of navigation and previous online shopping experiences modified these effects, indicating that impulsive reactions can be the result of a combination of environmental complexity and individual characteristics, but not only the number of possible choices.

Canarslan (2025) explained that the effect of choice architecture and cognitive load on impulsive buying and decision fatigue can be better understood. This is because in controlled online shopping simulations, consumers who were shown different assortment sizes were able to show that the quality of their decisions was reduced if the number of options increased beyond an optimal level. The more options that were offered an increased amount of time was taken to make a decision, as well as a lower satisfaction and increased chances of delaying or abandoning the purchasing decision. These findings support the theoretical model that suggests that the overload of choices leads to decision fatigue and lessens the use of cognitive resources, which in turn influences impulsive behaviour.

Shukla et al (2025) found that under conditions of information overload, impulsive buying tendencies are significantly higher in the e-commerce environment. Too much information on the product and platform creates cognitive overload that decreases effortful evaluation appeal among consumers. Thus, the persons end up with a hurry to make decisions. This study also revealed positive relationship between impulsive purchase and product return intention, indicating that decisions made due to overload often result in post purchase regret.

Rationale

With the growth of e-commerce, the way consumers search for products and make purchasing decisions has been drastically changed. The convenience of online shopping, accessibility and diversity of products. This convenience can also be a problem, however, when shoppers are faced with too many options. This is called choice overload and is when there are too many options and consumers become confused and use more mental effort to make a choice (Iyengar & Lepper, 2000; Schwartz, 2004). Internet retailers can offer many different versions of the same product and it is difficult for customers to compare the different products and make informed choices (Botti & Iyengar, 2006).

Studies have shown that when there are many options to choose from, mental stress can occur, leading to less satisfaction and higher frustration and making it more difficult to make a decision (Chernev et al., 2015). Consumers may be getting bored while they are shopping and comparing products, causing a phenomenon called decision fatigue. This psychological state refers to the mental fatigue people feel after they have made many decisions and consequently limits their self-control and judgment (Baumeister et al., 1998; Vohs et al., 2008). Decision fatigue is especially relevant when shopping online as consumers may spend long periods of time comparing features, reading reviews and checking out prices (Dholakia, 2000).

A major effect of decreased self-control is impulsive buying, which is characterized by buying behavior that is sudden and without planning

(Rook, 1987). Impulsive buying is frequently emotionally made instead of thoughtfully made. Environmental cues such as limited time offers or discounts, or personalized advertisements can also trigger impulsive purchase behavior, particularly when consumers are cognitively depleted (Verplanken & Herabadi, 2001) as is often the case in online shopping. Research shows decision fatigue can make it harder for consumers to behave rationally, which is what makes it easier for them to make impulse purchases (Vohs & Faber, 2007). The implications of impulsive buying have been studied in detail in the consumer behavior field, but the combined impact of choice overload and decision fatigue on impulsive buying behavior has received relatively little research. This difference is especially pronounced in developing nations like Pakistan, where online shopping has come to a great extent in the past few years. Pakistan's consumers are moving toward e-commerce, online marketplaces and social media stores, where they are likely to encounter high quality and quantity of products, as well as constant marketing messages. Yet there has been little research in the academic world that has explored the psychological effects of too many choices on Pakistani online shoppers and whether decision fatigue is a factor in their impulsive buying habits.

This study is significant as it sheds light on the behavior of online consumers under cognitive pressure. This study, which examines the relationship between choice overload and decision fatigue, expands the literature on the consumer decision-making process by investigating how these two factors interact in relation to impulsive purchasing behavior (Baumeister et al., 1998; Chernev et al., 2015). Furthermore, research results from this study might offer practical implications to online retailers. Product variety and repeated decision making can help to understand how consumers behave in relation to the product, which will enable e-commerce business to improve the design of their websites, ease of product display and to create more user-friendly filtering systems that reduce mental strain and improve customer experience (Häubl & Trifts, 2000).

Research Questions

- Does Choice Overload significantly predict Impulsive Buying in Online Shoppers?
- Does Decision Fatigue significantly predict impulsive buying in Online Shoppers?
- Does Decision Fatigue mediate the relationship between Choice Overload & Impulsive Buying?

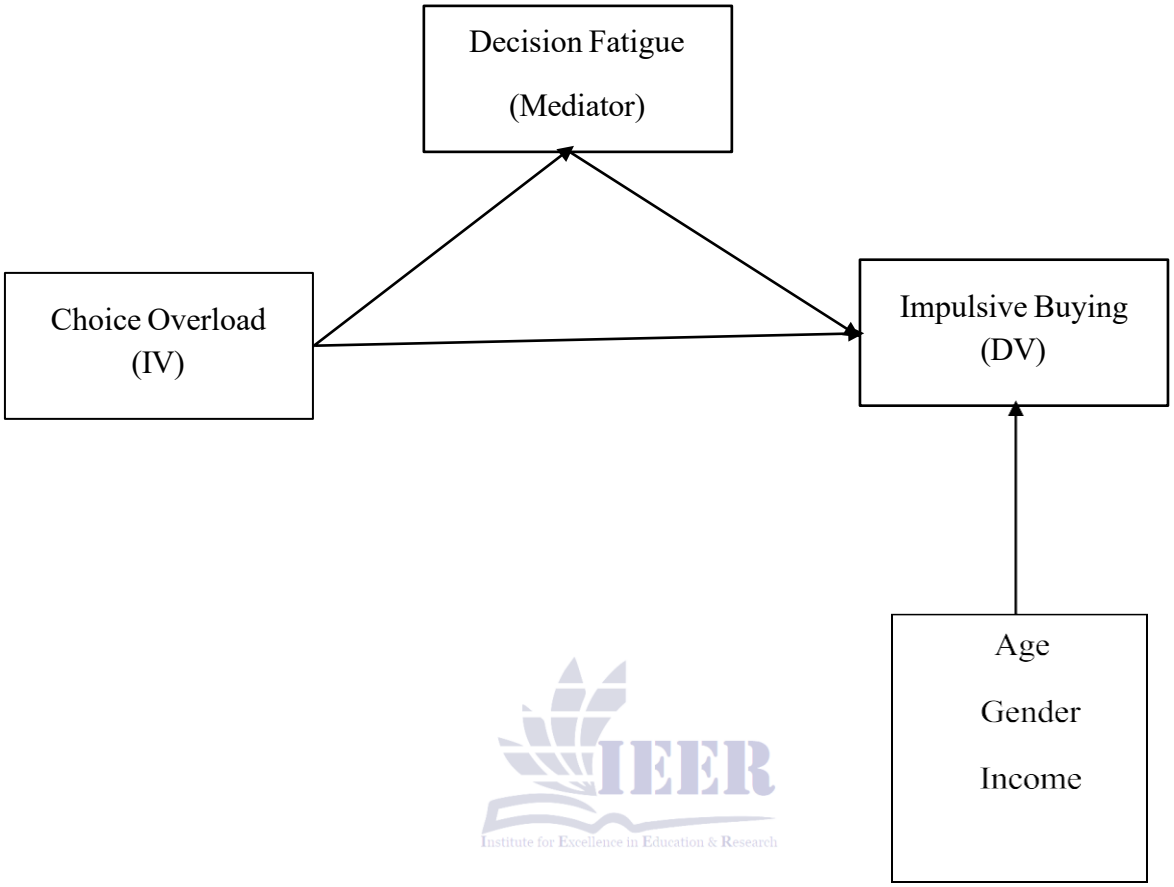
Objectives

- To examine the relationship between choice overload, decision fatigue and impulsive buying in online shoppers.
- To which extent choice overload affects impulsive buying tendencies.
- To investigate the mediating role of decision fatigue between choice overload and impulsive buying.

Hypotheses

- There is likely to be a positive correlation between choice overload, decision fatigue and impulsive buying in online shoppers.
- Decision fatigue is likely to mediate the relationship between choice overload and impulsive buying.
- Younger people are more likely to engage in impulsive buying behaviour.
- Women are more likely than men to engage in impulsive online buying behaviors.
- Individuals with higher income are more likely to engage in impulsive online buying compared to lower-income individuals.

Conceptual Model of the Research



Method

Research Design

The study used a quantitative correlational design with a cross-sectional approach to examine the relationships among choice overload, decision fatigue, and impulsive buying among online shoppers. This design was suitable for assessing naturally occurring variations in variables and determining the strength and direction of their associations. Data were collected at a single point in time through a cross-sectional survey of active online consumers in Pakistan, allowing efficient collection from a relatively large and diverse sample.

Sample & Sampling Strategy

The study used a non-probability sampling approach, specifically a purposive sampling technique to target active online shoppers. Data collection was conducted through questionnaires distributed to individuals engaged in frequent online purchasing. The sample size was N = 200 participants based on recommendations for adequate statistical power in correlational studies.

Inclusion Criteria

- Participants between 18 and 40 years of age were included in the study.
- Both male and female participants were included in the study.
- Individuals who had made at least one online purchase within the past three months were included in the study.

Exclusion Criteria

- Individuals who had never engaged in online shopping were excluded.
- Individuals with medical conditions were excluded.

• Individuals taking medications or with substance addiction were excluded.

Assessment Measures

Demographic Information Sheet

A self-created sheet collects basic participant information, including age, gender, education, occupation, marital status, monthly income, frequency of online shopping and socioeconomic status.

Choice Overload Scale (Manolică et al., 2021)

Choice overload, also referred to as over choice, is defined as a cognitive process characterized by the difficulty of making a decision when multiple options are available, arising from overwhelmingness, assortment size, evaluation costs and product diversity (Manolică et al., 2021). This scale comprises of 6 items. Items are rated on a 10-point Likert scale ranging from 1 (Strongly Disagree) to 10 (Strongly Agree). An example item from the scale is: "When shopping, I feel overwhelmed by the number of product options available to me." This instrument is specifically designed for consumer contexts and is suitable for assessing experiences in online shopping environments.

Decision Fatigue Scale (DFS) (Hickman Jr., 2018)

Decision fatigue refers to the depletion of cognitive and self-regulatory resources following prolonged or repeated decision-making, which subsequently reduces the quality of decisions made thereafter.

The scale was initially developed with 10 items, Items are rated on a five -point Likert scale Items are rated from 1 (Totally Disagree) to 5 (Totally Agree). with higher scores indicating a greater degree of decision fatigue. An example item from the scale is: "It takes too much effort to make decisions," which was identified as the highest-loading item and is representative of the underlying theoretical construct of decision fatigue.

Consumer Impulsive Buying Tendency Scale (Uygur, 2018)

Consumer Impulsive buying tendency is defined as the degree to which an individual is likely to make unintended, immediate and unreflective purchases representing a shift in consumer behavior research from purely rational decision-making models toward the recognition of emotions, irrationalities and spontaneous impulses as central forces in purchasing.

The scale was initially developed with 10 items, Items are rated on a five -point Likert scale Items are rated from 1 (Strongly Disagree) to 5 (Strongly Agree). An example item from scale is: I buy things without any previous intention to buy them that day.

Procedure

The study used standardized, validated scales with permission from the original authors, and data were collected in English under university authorization. A non-probability purposive sampling technique was used to recruit active online shoppers, with face-to-face questionnaire administration in universities and public places. Participants were informed about the study purpose, gave informed consent, and were assured of confidentiality, anonymity, voluntary participation, and the right to withdraw.

Each questionnaire took approximately 10–15 minutes to complete, with the researcher present to clarify queries without influencing responses. After data collection, responses were checked for completeness, screened for missing values, coded, and entered into SPSS.

Ethical Considerations

In order to carry out the study, the following ethical consideration were taken care of:

• Obtaining approval from relevant authorities before data collection.

• Providing the questionnaire only to participants who meet inclusion criteria.

• Ensuring privacy and confidentiality of participant data.

• Clearly explaining the study's purpose to participants.

• Securing formal consent prior to participation.

• Protecting participant identities and

maintaining confidentiality throughout the study.

Results

In this chapter, the results of the current study are presented. The main purpose of this study is to examine the relationship among Choice Overload, Decision Fatigue & Impulsive Buying in Online Shoppers.

Reliability Analysis of Choice Overload, Decision Fatigue & Impulsive Buying in Online Shoppers (N=200)

Measures	α	Range	*M*	*SD*
Choice Overload	.915	60	41.08	10.24
Decision Fatigue	.913	50	33.40	7.91
Impulsive Buying	.925	50	34.24	7.86

Note. M= Mean; SD= Standard Deviation; α = Cronbach's Alpha

The reliability analysis demonstrated strong internal consistency for all study variables, indicating that the measurement scales were highly reliable. The descriptive results suggest that participants generally experienced moderate levels of choice overload, decision fatigue and impulsive buying behavior. Overall, the findings indicate that online consumers face a noticeable level of cognitive burden during decision-making, which is associated with a tendency toward impulsive purchasing.

Pearson Product-Moment Correlation between Choice Overload, Decision Fatigue & Impulsive Buying in Online Shoppers(N=200)

Variable	1	2	3
Choice Overload	_	.645**	.629**
Decision Fatigue		_	.539**
Impulsive Buying			_

Note. p < .01(two-tailed)

A Pearson Product-Moment Correlation was conducted to examine the relationships among choice overload, decision fatigue and impulsive buying in online shoppers. The results show that all variables are significantly and positively related. Choice overload is strongly associated with decision fatigue, indicating that too many options increase mental exhaustion during decision-making. It is also strongly linked with impulsive buying, suggesting that excessive choices increase the likelihood of unplanned purchases. Decision fatigue shows a moderate positive relationship with impulsive buying, meaning that mentally exhausted individuals are more likely to

make impulsive purchase decisions. Overall, higher choice overload is associated with increased decision fatigue and impulsive buying behavior.

Hierarchical Regression Analysis of Choice Overload, Decision Fatigue & Impulsive Buying in Online Shoppers(N=200)

Predictors	*B*	*SE*	*β*	*95% CI*		R^2	ΔR^2
				LL	*UL*		
Model 1						.072	.072
(Constant)	31.549***	5.820	—	20.07	43.03		
Age	.280	.198	.107	-0.11	0.67		
Gender	-3.087*	1.206	-.194	-5.46	-0.71		
Family income	.581	.693	.058	-0.79	1.95		
Model 2						.456	.384***
(Constant)	17.469***	4.626	—	8.35	26.59		
Age	.042	.153	.016	-0.26	0.34		
Gender	-3.472***	.926	-.218	-5.30	-1.65		
Family income	.798	.532	.079	-0.25	1.85		
Choice Overload	.480***	.041	.626	0.40	0.56		
Model 3						.491	.036***
(Constant)	15.120**	4.529	—	6.19	24.05		
Age	-.007	.149	-.003	-0.30	0.29		
Gender	-3.638***	.899	-.229	-5.41	-1.87		
Family income	1.011	.519	.101	-0.01	2.04		
Choice Overload	.359***	.052	.468	0.26	0.46		
Decision Fatigue	.248***	.067	.249	0.12	0.38		

Note. $p < .05$, $p < .01$, $p < .001$. Dependent variable = Impulsive Buying

A hierarchical regression analysis was performed to determine whether choice overload and decision fatigue predict impulsive buying after controlling for age, gender, and family income. In Model 1, the demographic variables accounted for a small but significant amount of variance in impulsive buying behavior, with gender emerging as a significant predictor whereas age and family income were not significant. In Model 2, adding choice overload significantly improved the model and explained a considerable additional proportion of variance. Choice overload appeared

as a strong positive predictor of impulsive buying, indicating that higher levels of choice overload are associated with greater impulsive buying tendencies, while gender remained significant and age and family income remained non-significant. In Model 3, the addition of decision fatigue further improved the model and explained a significant additional proportion of variance. Decision fatigue emerged as a significant positive predictor of impulsive buying even after controlling for demographics and choice overload, suggesting that greater decision fatigue independently contributes to increased impulsive buying tendencies. Gender continued to remain significant throughout all models, while age and family income remained non-significant across the models. Overall, the results suggest that both choice overload and decision fatigue are key determinants of impulsive buying beyond demographic characteristics.

Mediation Analysis of Choice Overload, Decision Fatigue & Impulsive Buying in online shoppers (N=200)

Path	*B*	*SE*	*β*	*t*	*95% CI*	
					LL	*UL*
Total effect (TCHO → TCIBT)	0.48	0.05	.629	6.83***	0.26	0.48
Direct effect (TCHO → TCIBT)	0.37	0.05	.482	6.83***	0.26	0.48
TCHO → TDFS	0.50	0.04	.645	11.88***	0.42	0.58
TDFS → TCIBT	0.23	0.07	.228	3.22**	0.09	0.36
Indirect effect (TCHO → TDFS → TCIBT)	0.11	0.05	—	—	0.02	0.21

Note. ***$p < .001$, **$p < .01$, *$p < .05$.

A mediation analysis was conducted using Hayes PROCESS macro (Model 4) to examine whether decision fatigue mediates the relationship between choice overload and impulsive buying behavior. The results indicated that choice overload significantly predicted impulsive buying behavior. When decision fatigue was included in the model, the direct effect of choice overload on impulsive buying behavior remained statistically significant, indicating partial mediation. In addition, choice overload significantly predicted decision fatigue, and decision fatigue significantly predicted impulsive buying behavior. The indirect effect was also statistically significant, confirming that decision fatigue partially mediates the relationship between choice overload and impulsive buying behavior.

Gender differences on Choice Overload, Decision Fatigue & Impulsive Buying in Online Shoppers (N=200)

Variable	Male		Female		*t (198)*	*p*	*95% CI*		*Cohen's d*
							LL	*UL*	
	M	*SD*	M	*SD*					
Choice Overload	41.31	10.83	40.92	9.84	0.26	.79	-2.52	*3.30*	0.04
Decision Fatigue	33.35	8.88	33.44	7.19	-0.08	.93	-2.34	*2.15*	0.01
Impulsive Buying	36.51	7.91	32.64	7.45	3.52	.001**	*1.70*	*6.03*	0.51

Note. M= mean, SD= standard deviation LL=lower limit UL= upper limit p=significance value.

An independent samples t-test was conducted to examine gender differences in Choice Overload, Decision Fatigue and Impulsive Buying in online shoppers. Data was normally distributed and assumptions were fulfilled. Results revealed non-significant gender differences for Choice Overload and Decision Fatigue, suggesting that males and females experience similar levels of excessive choice and mental exhaustion during online shopping. However, a significant gender difference was found in Impulsive Buying with males scoring higher than females. These findings suggest that while gender does not strongly influence perceptions of choice overload and decision fatigue in this sample, it may play a role in impulsive buying behavior in online consumers.

ANOVA on Choice Overload, Decision Fatigue & Impulsive Buying in Online Shoppers(N=200)

Variable	Up to 50K		50K to 100K		100K onwards		*F (2,197)*	η^2
	M	*SD*	*M*	*SD*	*M*	*SD*		
Income	33.2833	8.05088	34.5000	7.95237	34.8548	7.59173	.675	.007

Note. M = Mean; SD = Standard Deviation; F = One-way ANOVA; η^2 = Eta squared. p > .05.

The one-way ANOVA indicates that income does not have a statistically significant effect on impulsive buying. Although slight differences in mean scores were observed across income groups, these differences were not statistically meaningful. The very small effect size further suggests that income explains a negligible proportion of variance in impulsive buying. Overall, it can be concluded that impulsive buying does not significantly differ across income levels in this sample, and the observed variations are likely due to random fluctuation rather than a meaningful effect**.**

Discussion

The present study focused on the relationship between choice overload, decision fatigue and impulsive buying behavior of online shoppers. In general, the results were supportive of the proposed framework and indicated the important role of cognitive processes in the development of the impulsive purchasing behavior in online context. The findings all showed that the more product options people were exposed to, the more this overload led to them feeling cognitively fatigued, and that this fatigue led to impulsive purchases. The first hypothesis stated that there is a positive relationship between choice overload, decision fatigue and impulsive buying. This hypothesis has been completely confirmed by the obtained results, since all three variables are positively and significantly correlated with each other. There was a strong positive correlation between choice overload and both decision fatigue and impulsive buying, and between decision fatigue and impulsive buying. This is consistent with two theories that propose that the human brain can process only a certain amount of information and that self-control is limited (Sweller, 1988; Baumeister et al., 1998). The cognitive overload that online shoppers experience when they see a variety of options depletes the lines of communication which makes it harder to think carefully and deliberately. This loss of cognitive function makes it more likely to engage in impulsive buying.

The results also align with previous studies that found that an overload of choice can lead to poorer decision-making and higher levels of psychological strain. For online shopping, consumers are confronted with huge offerings, recommender systems, price comparisons and so on, which makes it more complicated to decide. This situation aggravates mental strain and increases mental fatigue, thereby resulting in less conscious buying decisions and more impulsive buying.

The second hypothesis put forward was that decision fatigue would mediate between the two variables, choice overload and impulsive buying. Results of the mediation analysis provided support for a partial mediation effect. There was a significant association between choice overload and decision fatigue and between decision fatigue and impulsive buying. The indirect effect was also significant, suggesting some of the relationship between choice overload and impulsive buying is accounted for by decision fatigue. There was, however, a direct effect of choice overload on impulsive buying, indicating that other mechanisms are at work.

These results suggest that decision fatigue is a critical process by which choice overload leads to impulsive buying. Constantly engaging in decision making in online shopping can over time diminish the self-regulatory resources and make it more difficult for the individual to resist the urge to buy now. The continued presence of a direct effect implies that the impact of cognitive overload on impulsive buying might be explained by other factors besides fatigue, such as immediate psychological responses in the purchasing process.

The third hypothesis stated that there would be a positive relationship between impulsive buying and younger age groups. This hypothesis was not confirmed because age was not a significant predictor of impulsive buying behaviour. The findings indicate that there may not be significant differences in impulsive buying tendency among the age groups in online setting. This could be due to the fact that across all age groups, online retail systems are being adopted so there is not such a difference in behavior as one might associate with different age groups.

The fourth hypothesis was that here will be a significant difference between women and men in impulsive buying. Contrary to this expectation, the result showed that male's score was significantly higher than female's score on impulsive buying behavior. No gender difference was observed though in choice overload or decision fatigue. This suggests that although there is similarity in cognitive experience of overload and fatigue between women and men, there is a possibility of different behavioral responses to overload and fatigue between genders. The findings indicate that in online environments, consumers might be more likely to transform their

thinking effort into a hasty and impulsive purchase, particularly when it comes to men.

The final hypothesis suggested that income would significantly affect impulsive buying behavior so that the higher income individuals would be more impulsive. This hypothesis was not supported because there were no significant differences between income groups. Findings show that financial status does not significantly influence the tendency of impulsive buying behavior in online shopping. Rather, it seems that the tendency to make impulsive purchases is more similar across different income levels, implying that more than economic capacity, it is cognitive and situational factors that are more central.

The results of the present study, as a whole, suggest that there is a coherent and theoretically consistent explanation for impulse buying behaviour in online shopping context. In all analyses, there was a nice and stable cognitive pathway in such a way that psychological manifestations of information processing and self-regulatory depletion were the main factors involved in impulsive buying and not demographic factors.

The results consistently demonstrate that choice overload functions as the initial cognitive trigger in this process. Too many product options cause an online shopper's cognitive system to constantly evaluate, compare and eliminate options. This raised mental demand that results in challenges to structured and efficient decision making. This means that people suffer from cognitive strain, which undermines rational evaluation processes and leads to a decrease in people's capacity to take deliberate purchasing decisions.

This mental effort then leads to decision fatigue, a state of lowered mental energy and lowered self-regulatory ability. The results obtained from the present study clearly show that decision fatigue is a central mediator between choice overload and impulsive buying tendency. When consumers are tired from making many decisions, they are less able to control impulses which can lead to buying products out of impulse.

Importantly, the results reveal that choice overload effects are not always due to decision fatigue. However, it also has a direct effect on impulsive buying behavior, indicating that there is an additional immediate cognitive/psychological pathway. This means that the sheer volume of options can be enough to spark a heuristic decision-making process or an emotional reaction, or less mental effort, which can lead to impulsive buying. These results are consistent with a dual-route model of impulsive buying, both because accumulated cognitive depletion was a factor and because responses to a high information load (as opposed to decreased information) were found.

The findings also reveal an important pattern of the relative stability of cognitive effects as opposed to demographic variables. There was no significant relationship between impulsive buying behavior and age and income, so it can be seen that the structural factors are very limited in explaining impulsive buying behavior in the context of online shopping. This indicates that impulsive buying behavior can be found across all age groups and income brackets, and is rather a more general form of behavioral reaction to cognitive overload in digital settings.

Gender differences were found for impulsive buying behavior, with males showing higher levels of impulsive buying behavior than females, but no gender differences were found for choice overload or decision fatigue. This means that although both sexes suffer the same cognitive effort and mental fatigue when they are online shopping, they may not do so in exactly the same way in terms of converting the strain to actual purchases. This further supports the idea that impulsive buying is more driven by the behavioral reactions to cognitive states than by differences in the cognitive states. Overall, the findings of the present study seem to point to a common explanation in which impulsive buying can be viewed as a result of a cognitive depletion process. Too many choices add to the cognitive load, causing a sense of decision fatigue, and both decision fatigue and too much choice diminish the consumer's ability to make a controlled choice. Moreover, the feeling of being flooded by a wide variety of items can also lead to impulsive reactions. This integrated pattern highlights impulsive buying as a dynamic

interaction between cognitive overload, self-regulatory depletion, and situational decision pressures in online retail environments.

The results show that the impulsive buying in online contexts is strongly associated to cognitive factors especially choice overload and decision fatigue. The results emphasize the importance of mental effort and self-regulatory depletion in influencing consumer behavior in situations of high product variety and decision-making demands. Overall, the findings demonstrate that impulsive buying in online environments is closely linked to cognitive processes particularly choice overload and decision fatigue. The results highlight the role of mental effort and self-regulatory depletion in shaping consumer behavior when individuals are exposed to extensive product options and continuous decision-making demands.

Conclusion

This study aimed to explore the correlation between choice overload, decision fatigue and impulsive buying behavior of online shoppers in Pakistan. The results indicate that higher product variety not only directly leads to impulsive purchases, but also indirectly causes impulsive purchases as a result of decision fatigue. All three variables were found to have a significant relationship and choice overload was found to be partially mediated by decision fatigue and impulsive buying. It was found that there were gender differences only in the impulsive buying and that age and income did not affect. Throughout the study ethical procedures were followed. The study has implications for consumer psychology, as it helps to understand the role of cognitive overload in online buying behaviour and offers empirical data for e-commerce design in a structured, cognitively supportive environment. Longitudinal effects should be explored in future research and practical interventions for decision fatigue in digital shopping situations should be tested.

Limitations

- Self-reported measures of decision fatigue and impulsive buying were used which may suffer from recall bias and social desirability effects and may impact the accuracy of responses.
- Convenience sampling might limit the generalizability of the results because the sample may not adequately represent the larger population of online consumers.
- Results may not be applicable to other age groups, socioeconomic status or cultural contexts.
- Mood, previous cognitive load and time of participation were not controlled and this may have affected the participants responses.
- The type of device (mobile vs desktop) and differences among online shopping environments were not controlled and may have impacted the user experience and decision-making process.

Implications

- Choice architecture interventions e.g., limiting the number of products available in a category could be used to help curb impulsive buying by lessening the choice overload and preventing early onset of decision fatigue during online shopping.
- Decision-support functions such as micro-pauses, progress indicators or session time warnings might help users recover their cognitive resources before making purchase decisions and therefore help improve deliberation quality.
- Structuring shopping sequences online e.g., from simple to complex choices can help to minimize cognitive load and decrease the risk of impulsive buying due to fatigue.
- E-commerce platforms can use real-time tracking of user behavior like browsing time and switching between items to detect decision fatigue and adjust the website to make shopping simpler and more organized, helping customers make more rational buying decisions.
- These results offer a foundation for further research and real-life implications in the field of consumer psychology, focusing on the role of cognitive load factors like choice overload and decision fatigue on online purchasing intentions.

Suggestions

- Platforms should consider designing simplified browsing interfaces to reduce cognitive burden on users.
- E-commerce platforms should improve filtering and sorting systems to make product selection easier.
- Future studies should examine additional psychological factors such as stress, emotional regulation, and self-control.
- Research should explore moderating variables like income level, age, and personality traits.
- Longitudinal and experimental designs should be used to establish causal relationships.
- Future research should test these relationships across different cultural and online shopping contexts.

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