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The Impact of Digital Wallets on Consumer Spending Behavior in
Greece

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Patras, Greece, June 2026

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The Impact of Digital Wallets on Consumer Spending Behavior in Greece

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*To Rania and our two little girls, Georgia and Athanasia, whose love, patience, and
presence were my greatest source of strength throughout this journey.*

Abstract

This dissertation examines how digital wallets influence consumer spending behavior in Greece, with a focus on the psychological mechanisms that may explain this relationship. Although digital wallet use has grown rapidly, most prior research has focused on why consumers adopt these tools rather than how they shape spending once in use. Evidence from Greece also remains limited. The study focuses on two key psychological perceptions: Psychological visibility of spending and perceived spending control. It also examines impulse buying as a mediating mechanism between these perceptions and spending behavior.

A quantitative, cross-sectional research design was adopted. Primary data were collected through an online questionnaire completed by 153 active digital wallet users living in Greece. The main constructs measured were Psychological Visibility of Spending, Perceived Spending Control, Impulse Buying, and Spending Behavior. The data were analyzed in SPSS using descriptive statistics, reliability tests, Pearson correlation, linear and multiple regression, and mediation analysis through PROCESS Model 4.

The findings show that reduced psychological visibility of spending and reduced perceived spending control are both strongly associated with impulse buying. Impulse buying also significantly predicts spending behavior. Reduced psychological visibility of spending has both a direct positive relationship with spending behavior and an indirect relationship through impulse buying, indicating partial mediation. The role of perceived spending control is more complex and operates mainly through impulse buying.

This study contributes to the limited research on digital wallets and consumer spending behavior in Greece by showing that psychological factors may play an important role in how consumers spend when using these payment methods. The findings offer practical value for consumers, digital wallet providers, and policymakers as digital payments continue to expand.

Keywords

digital wallets, consumer spending behavior, impulse buying, psychological visibility of spending, perceived spending control, Greece.

Περίληψη

Η παρούσα διπλωματική εργασία εξετάζει τον τρόπο με τον οποίο τα ψηφιακά πορτοφόλια επηρεάζουν την καταναλωτική συμπεριφορά στην Ελλάδα, με έμφαση στους ψυχολογικούς μηχανισμούς που ενδέχεται να εξηγούν αυτή τη σχέση. Αν και η χρήση των ψηφιακών πορτοφολιών έχει αυξηθεί ραγδαία, η πλειονότητα της προγενέστερης έρευνας έχει επικεντρωθεί στους λόγους για τους οποίους οι καταναλωτές υιοθετούν αυτά τα εργαλεία, παρά στο πώς διαμορφώνουν τις δαπάνες κατά τη χρήση τους. Επιπλέον, τα ερευνητικά δεδομένα για την Ελλάδα παραμένουν περιορισμένα. Η μελέτη εστιάζει σε δύο βασικές ψυχολογικές αντιλήψεις: την ψυχολογική ορατότητα της δαπάνης και τον αντιληπτό έλεγχο επί των δαπανών. Εξετάζει επίσης την παρορμητική αγορά ως μηχανισμό διαμεσολάβησης μεταξύ αυτών των αντιλήψεων και της καταναλωτικής συμπεριφοράς.

Υιοθετήθηκε ποσοτικός, συγχρονικός ερευνητικός σχεδιασμός. Τα πρωτογενή δεδομένα συλλέχθηκαν μέσω διαδικτυακού ερωτηματολογίου, το οποίο συμπληρώθηκε από 153 ενεργούς χρήστες ψηφιακών πορτοφολιών που διαμένουν στην Ελλάδα. Οι κύριες μεταβλητές που μετρήθηκαν ήταν η Ψυχολογική Ορατότητα της Δαπάνης, ο Αντιληπτός Έλεγχος Δαπανών, η Παρορμητική Αγορά και η Συμπεριφορά Δαπανών. Τα δεδομένα αναλύθηκαν στο SPSS με χρήση περιγραφικής στατιστικής, ελέγχων αξιοπιστίας, συσχέτισης Pearson, γραμμικής και πολλαπλής παλινδρόμησης, καθώς και ανάλυσης διαμεσολάβησης μέσω του PROCESS Model 4.

Τα ευρήματα δείχνουν ότι η μειωμένη ψυχολογική ορατότητα της δαπάνης και ο μειωμένος αντιληπτός έλεγχος των δαπανών συσχετίζονται ισχυρά με την παρορμητική αγορά. Η παρορμητική αγορά προβλέπει επίσης σημαντικά τη συμπεριφορά δαπανών. Η μειωμένη ψυχολογική ορατότητα της δαπάνης παρουσιάζει τόσο άμεση θετική σχέση με τη συμπεριφορά δαπανών όσο και έμμεση σχέση μέσω της παρορμητικής αγοράς, γεγονός που υποδεικνύει μερική διαμεσολάβηση. Ο ρόλος του αντιληπτού ελέγχου των δαπανών είναι πιο σύνθετος και λειτουργεί κυρίως μέσω της παρορμητικής αγοράς.

Η παρούσα μελέτη συμβάλλει στην περιορισμένη έρευνα σχετικά με τα ψηφιακά πορτοφόλια και την καταναλωτική συμπεριφορά δαπανών στην Ελλάδα, καταδεικνύοντας ότι ψυχολογικοί παράγοντες ενδέχεται να διαδραματίζουν σημαντικό ρόλο στον τρόπο με τον οποίο οι καταναλωτές δαπανούν όταν χρησιμοποιούν αυτές τις μεθόδους πληρωμής. Τα ευρήματα προσφέρουν πρακτική αξία για τους καταναλωτές, τους παρόχους ψηφιακών

πορτοφολιών και τους φορείς χάραξης πολιτικής, καθώς οι ψηφιακές πληρωμές συνεχίζουν να επεκτείνονται.

Λέξεις - Κλειδιά

ψηφιακά πορτοφόλια, καταναλωτική συμπεριφορά δαπανών, παρορμητική αγορά, ψυχολογική ορατότητα της δαπάνης, αντιληπτός έλεγχος δαπανών, Ελλάδα.

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List of Abbreviations & Acronyms

BootSE	Bootstrap Standard Error
CI	Confidence Interval
ECB	European Central Bank
H	Hypothesis
IB	Impulse Buying
NFC	Near Field Communication
PROCESS	Hayes' PROCESS macro for SPSS
PSC	Perceived Spending Control
PVS	Psychological Visibility of Spending
RQ	Research Question
SB	Spending Behavior
VIF	Variance Inflation Factor

1 Introduction

Digital payments have become an important part of everyday consumer life. Over the last decade, payment methods have shifted from cash and physical cards toward faster and more convenient electronic alternatives. Applications such as Apple Pay and Google Wallet allow consumers to pay with a single tap of a phone or a watch. This development has made payments easier and more seamless, but it has also raised important questions about how consumers experience spending when money becomes less visible.

The growth of digital wallets is part of a broader movement toward cashless payments. This shift accelerated during the COVID-19 pandemic, when health concerns pushed people to contactless transactions (Hellemans et al., 2023). In Greece, the shift toward electronic payments has been significant and shaped by several factors, including the capital controls introduced in 2015, tax-related incentives for electronic payments, and the wider digitalisation of banking services (Danchev et al., 2020). As a result, Greece recorded one of the largest declines in cash use of any eurozone country in a 3-year range – 2019 to 2022 (ECB, 2022). Nevertheless, cash was still used in 54% of point-of-sale transactions by number in 2024 (ECB, 2024).

This transformation also affects how spending feels. Traditional cash payments make spending visible because the consumer physically hands over money and immediately sees the reduction in available cash. By contrast, digital wallet payments can reduce the psychological visibility of spending, weaken the pain of paying, and make the payment feel less connected to the actual loss of money. As a result, digital wallets may influence not only how people pay, but also how much they spend, how aware they feel during payment, and how easily they engage in impulse buying.

Studies on the “cashless effect” suggest that consumers may spend more when using non-cash payment methods compared with cash, although recent evidence also shows that this effect is small and may be weakening over time (Schomburgk et al., 2024). This means that digital payments should not be assumed to automatically increase spending. This study therefore examines the psychological mechanisms through which payment methods may influence consumer spending behavior and the direction this effect takes.

This study focuses on two relevant mechanisms: Psychological visibility of spending and perceived spending control. Psychological visibility of spending refers to how clearly consumers perceive the money leaving their account at the moment of payment. When payment is less visible, less tangible, or less painful, consumers may be less likely to evaluate the purchase carefully. Perceived spending control refers to the extent to which consumers feel able to regulate their spending and remain within their intended budget when using digital wallets. These two psychological-related factors are related to pain of paying, payment transparency, and self-regulation theories. They can also be considered as predictors of impulse buying, which can be described as an irresistible urge to buy (Rook, 1987).

1.1 Research Problem and Research Questions

The great majority of research on digital wallets has focused on why consumers adopt them, rather than on how they change spending once they are in use. More specifically, the psychological mechanisms through which digital wallet payments may encourage higher or more impulsive spending are still underexplored with evidence specific to Greece being even more limited. It is also a continuously evolving topic, as payment technology and consumer habits are constantly changing.

This study examines how psychological perceptions of digital wallet payments relate to consumer spending behavior in Greece, and whether impulse buying helps to explain that relationship. Below the main research questions:

RQ1: How does the psychological visibility of spending in digital wallet transactions influence consumers' impulse buying and overall spending behavior?

RQ2: How does perceived spending control influence impulse buying and overall spending behavior in digital wallet payment contexts?

RQ3: To what extent does impulse buying mediate the relationship between psychological perceptions of digital wallet payments and spending behavior?

2 Literature Review

2.1 Introduction

Digital wallets have reshaped consumer payments by making transactions faster, more convenient, and increasingly embedded in everyday life. Mobile payment applications such as Apple Pay, Google Wallet, Alipay, and a number of regional e-wallet platforms have moved from niche products to mainstream platforms. This chapter presents the most important theories relevant to the topic and the conceptual model of the study.

2.2 Theoretical Foundations

2.2.1 Pain of Paying Theory

The concept of pain of paying refers to the psychological discomfort consumers feel when they spend money. This pain serves as a self-regulatory mechanism that constrains spending by creating psychological resistance to give up money. When payment is psychologically salient, individuals are more aware that they are spending money, which can reduce the attractiveness of unnecessary or impulsive purchases (Prelec & Loewenstein, 1998; Zellermyer, 1996). More recently, Reshadi and Fitzgerald (2023) distinguished between pain experienced at the time of payment and pain associated with anticipating a future financial loss.

The intensity of this pain depends heavily on the transparency of the payment process, the extent to which the payment method makes the outflow of money visible and salient to the consumer. Soman (2003) showed that payment transparency is related to pain of paying, and lower transparency leads to greater consumption. Cash transactions are associated with the highest levels of payment pain because the consumer physically handles and visibly loses money, while credit card and digital payments, which decouple the purchase decision from the physical parting of money, reduce this pain (Prelec & Loewenstein, 1998; Raghubir & Srivastava, 2008; Broekhoff & van der Cruysen, 2024). For digital wallets, pain of paying is therefore relevant because the transaction requires little physical interaction and can make the financial outflow less noticeable.

2.2.2 Mental Accounting Theory

Thaler (1985, 1999) argued that consumers organize and evaluate their finances through a process of mental accounting. They tend to assign funds to different mental categories, such as food, entertainment, or savings. Spending decisions may then be judged against these separate budgets instead of total available resources, thus the same amount of money can be valued differently depending on how it is mentally labeled.

Payment method is one of several factors that can influence these processes. Skwara (2023) identified the source and intended use of funds, pricing perceptions, and payment methods as important themes in mental accounting research. Digital payments interact with traditional mental accounting processes in complex and contradictory ways. Digital payments may weaken the cognitive constraints that cash provides on spending.

Hernandez et al. (2017), for example, found that consumers, especially those facing economic issues, can consider cash as better than digital payment instruments for monitoring expenditure and keeping within a budget. However, digital wallet technologies can also enhance mental accounting through technology-related tools. Online banking and budgeting applications allow consumers to review transactions, monitor balances, create budgets, and set saving goals (Skwara, 2023).

2.2.3 Self-Regulation Theory

Self-regulation theory helps understanding how individuals exercise control over their impulses, desires, and behaviors in pursuit of long-term goals. Self-control depends on a limited cognitive resource that can be depleted through use, referred to as “ego depletion”. When those resources are reduced, individuals may become less able to resist attractive but undesirable actions (Baumeister et al., 2007). This perspective is relevant to buying decisions because many purchases involve a conflict between an immediate desire and an intention to limit expenditure.

Vohs and Faber (2007) provide a direct connection with impulse buying. Their findings showed that lower availability of self-regulatory resources was associated with stronger buying urges, greater willingness to spend, and higher spending in unexpected purchasing situations.

Self-regulation can also be considered as relevant to perceived spending control, which is one of the main variables analyzed in the present study. Digital wallets reduce the effort and time required to complete a transaction. If a purchase can be completed quickly, there may be fewer chances to reconsider an unplanned decision before payment.

2.3 Payment Methods and Digital Wallets as a Contemporary Payment Method

2.3.1 The Evolution of Payment Methods

Payment methods have been transformed over recent decades, shifting from cash and paper-based instruments toward digital forms of payment. The rise of the internet and e-commerce accelerated this change by providing a wide range of electronic payment options, including credit and debit cards, e-money, and contactless instruments (Panetta et al., 2023). Stavins (2021) in an empirical research also confirms this transition. Consumer payments have gradually shifted away from paper checks and, more slowly, away from cash with electronic and card payments taking their place. The contemporary payment landscape can be described across several dimensions, including the underlying payment instrument (e.g., card, e-wallet, bank transfer, cryptocurrency), the device used to initiate the transaction (e.g., plastic card, smartphone, wearable, computer), and the communication technology employed (e.g., NFC, QR code, online banking rails). A single transaction often belongs to several categories. For instance, a smartphone tap with Apple Pay is simultaneously a digital wallet payment (in terms of instrument, with a card as the underlying funding source), a mobile payment (in terms of device), and an NFC payment (in terms of technology). Reflecting this complexity, Khando et al. (2023) grouped digital payment technologies into four broad categories:

- card payments (credit and debit cards, in contact and contactless form)
- e-payments (e-banking, peer-to-peer transfers)
- mobile payments (NFC, QR code, and other phone-based transactions)
- cryptocurrency-based payments

2.3.2 Contactless Payments and Digital Wallets

Contactless payments allow consumers to complete transactions by holding a card, smartphone, or wearable device near a payment terminal equipped with contactless technology (Jakobs & Savatova, 2023, para. 3). At the euro area level, contactless card payments reached 29.6 billion transactions in the first half of 2025, representing 83% of all non-remote card payments (European Central Bank [ECB], 2026), indicating that contactless payment has become the dominant form of face-to-face card use.

Digital wallets, also known as electronic wallets or e-wallets, are software-based systems that securely store users' payment information and enable electronic transactions through mobile devices or computers. These systems have evolved from simple stored-value cards to sophisticated platforms that integrate payment processing, financial management, loyalty programs, and even credit services such as Buy-Now-Pay-Later (BNPL) options (Bian et al., 2023). The global adoption of digital wallets has been accelerated by several factors including the proliferation of smartphones, technological advances like NFC and QR code, government initiatives promoting cashless economies, and the public health consequences of the COVID-19 pandemic (Hellemans et al., 2023, Danchev et al., 2020). Perceived usefulness, perceived risk, social influence, trust, and perceived ease of use have been identified as key factors influencing consumers' intention to use mobile payment services (Liu et al., 2019).

2.3.3 Digital Payments in the Greek Landscape

Over the past decade, the Greek payment landscape has faced a rapid transformation, driven by the debt crisis, the imposition of capital controls, and the digital transformation triggered by the COVID-19 pandemic.

The imposition of capital controls in June 2015, during the peak of the Greek debt crisis, was a turning point for digital payment adoption in Greece. Restrictions on cash withdrawals motivated consumers and merchants to adopt electronic payment methods. According to Danchev et al. (2020), the value of payment card transactions in Greece more than tripled between 2014 and 2017, as a result of the capital controls and law 4446/2016, which made electronic payments mandatory for certain transaction types and introduced tax incentives for card usage. Despite this growth, the average level of card use in Greece remained below

the European Union average. It is also worth mentioning that rural regions and traditionally cash-intensive service sectors exhibited lower adoption rates.

The COVID-19 pandemic further promoted the use of digital payments in Greece, while research conducted during this period showed that adoption was influenced by several factors. For instance, Anysiadou et al. (2021) found that perceived usefulness, ease of use, risk, hedonic motivation, and social influence were all related to mobile banking adoption, with younger and more highly educated consumers more likely to adopt these services. A similar pattern appears in research focused on NFC mobile payments. Consumer attitudes toward them have been found to be the primary driver of adoption intentions, followed by social influence, perceived behavioral control, and risk perceptions (Giovanis et al., 2020).

The Greek government has also implemented a series of legislative measures to promote electronic payments in order to minimize tax evasion. The penetration of electronic payments has been estimated to contribute to at least 50% of the annual increase in VAT revenues recorded in 2017 (Danchev et al., 2020). More recent analysis, however, has found that the relationship between digital payment usage and tax revenues was not statistically significant over the period studied, suggesting that the fiscal benefits of digital payments may be more complex than initially assumed (Kounadeas, 2023).

The most authoritative cross-national data on Greek payment behavior comes from the European Central Bank's Study on the Payment Attitudes of Consumers in the Euro Area (SPACE), which tracks euro-area consumers' payment behavior, preferences, and access to payment instruments. Greece experienced one of the largest declines in cash usage among all euro area countries between 2019 and 2022, with a reduction of 18 percentage points in the share of cash payments at the point of sale (ECB, 2022). Despite this shift, Greece remained among the more cash-reliant economies in the euro area, with over 80% of person-to-person payments still conducted in cash in 2022 (ECB, 2022). The most recent SPACE 2024 results show that this transition has continued, although Greek consumers retain a stronger cash culture than the euro area average. Cash was used in 54% of Greek POS transactions by number, compared with 52% in the euro area as a whole, while cards were used in 37% of transactions in Greece, compared with 39% across the euro area (Stratopoulou, 2025; ECB, 2024). In terms of transaction value, however, the picture reverses. Cards accounted for 47% of payment value in Greece, and cash accounted for 42%, indicating that Greek consumers increasingly rely on cards for higher-value purchases while

continuing to use cash for everyday small transactions (Stratopoulou, 2025). Mobile device payments remained limited at 5% of transactions by number and 6% by value in Greece, broadly in line with the euro area averages of 6% and 7% respectively (Stratopoulou, 2025; ECB, 2024), while 50% of Greek respondents preferred to pay peers with cash, compared to the euro area average of 35% (ECB, 2024).

2.3.4 The Cashless Effect on Consumer Spending

As “cashless effect”, is described the tendency for consumers to spend more when paying without cash. In a recent meta-analysis, Schomburgk et al. (2024) found a small but significant increase in spending when consumers used cashless rather than cash payment methods. Their findings also show that the relationship is not equally strong in every situation, since the cashless effect has weakened over time, possibly because consumers have become more familiar with non-cash payments. Furthermore, context appears to matter more than payment-method features alone. The cashless effect is stronger in conspicuous consumption settings, weaker in prosocial consumption contexts, and more intense during periods of economic growth. This variation may indicate that rather than assuming that the use of a cashless method automatically leads to higher spending, it may be more useful to examine the conditions under which such an effect occurs. Results are not entirely consistent. Payment method may matter, but its effect appears to depend partly on the consumer and the context in which the payment takes place. Liu and Dewitte (2021) attempted to replicate the previously reported effect across four studies but did not reproduce it consistently. They found some differences between mobile payments and cash in basket value in a laboratory setting, but the overall outcome was mixed. Their meta-analysis also indicated that the credit card effect had weakened over time, an observation that is consistent with Schomburgk et al. (2024).

2.4 Psychological Visibility of Spending

Psychological visibility of spending refers to the degree to which a consumer is cognitively and emotionally aware of the loss of money that occurs during a transaction. This idea includes the transparency, salience, and the extent to which a payment “feels like spending” (Prelec & Loewenstein, 1998; Soman, 2003; Raghubir & Srivastava 2008). Some payment

methods make this outflow more noticeable than others. Cash involves physically giving money away, whereas digital payments can make the same financial loss less visible. A payment may be completed with a tap, a phone confirmation, or biometric authentication, without any physical exchange of money, resulting in less attention during the transaction than it does when cash is used (Faraz & Anjum, 2025).

2.4.1 Payment Coupling

One way of explaining differences in spending visibility is through payment coupling. Raghurir and Srivastava (2008) use this concept to describe how closely the act of purchasing is mentally connected with giving up money. When this connection is weaker, consumers may become less sensitive to the cost of the purchase, even when comparing payments of the same value, such as cash versus stored-value certificates. This effect becomes weaker when people are made more aware that they are giving up money. Cash payments are tightly coupled: the decision to buy and the physical transfer of money occur simultaneously, making the cost of the purchase tangible and immediate. Credit card payments are less coupled, as the actual financial outflow is postponed until a later billing date. Digital wallet payments may further weaken this coupling by adding extra layers of abstraction, since the money flows digitally from a linked bank account. This does not mean that digital wallets necessarily remove awareness of spending but they can make the connection between the purchase and the reduction of available financial resources less direct. This abstraction produces an "illusion of liquidity" in which users perceive themselves as having more available funds than they actually do (Aji & Adawiyah, 2022), contributing to higher spending.

2.4.2 Pain of Paying in Digital Payment Contexts

The pain of paying is considered as a primary mechanism through which payment visibility influences spending. As discussed in 2.2.1, the concept of the pain of paying refers to the negative psychological response associated with spending money and serves as an important self-regulatory mechanism that constrains spending (Prelec & Loewenstein, 1998), and its intensity is directly shaped by payment transparency (Soman, 2003). This psychological cost is not fixed but varies depending on how salient and immediate the payment is. Payment methods that are more transparent and tangible, such as cash, tend to evoke stronger pain,

whereas less tangible methods, including cards and digital payments, weaken this response by reducing the visibility of the outflow of money (Raghubir & Srivastava, 2008).

In digital wallet contexts, this can be more intense, as transactions are completed seamlessly, frequently without any physical interaction, thereby further decoupling the act of payment from the act of consumption. Digital wallets may affect the psychological experience of paying, strengthening the idea that reduced visibility of spending (and as a result reduced pain of paying), is a mechanism through which digital payments influence consumer behavior.

2.4.3 Spending Visibility and Spendception

A closely related construct is “Spendception”, which describes the reduced psychological resistance to spending when using digital payment methods compared to cash, due to the diminished visibility of transactions and the perceived ease of payments (Faraz & Anjum, 2025). Spendception combines four dimensions: psychological visibility of spending, perceived spending control, ease of digital payment, and emotional detachment. Two of these dimensions, psychological visibility and perceived control, align directly with the conceptual model of the present study. This makes Spendception a useful reference point, while this study adopts a narrower structure by separating the relevant psychological components rather than treating them as one higher-order construct.

The concept is valuable because it captures the idea that digital payment can make spending feel less noticeable, less tangible, and less important at the moment of purchase. In that sense, it fits closely with this study’s understanding of psychological visibility of spending. It is also directly relevant because evidence suggests that Spendception increases purchase behavior and that impulse buying partially mediates this relationship, offering support for the mechanism examined in the present research (Faraz & Anjum, 2025).

2.5 Perceived Spending Control

Perceived spending control refers to consumers’ subjective assessment of their ability to regulate and manage their spending. The construct is closely related to self-control and self-regulation, but it is more specific to spending decisions and to the consumer’s felt ability to

keep spending within acceptable limits. This section reviews the literature that links control-related processes to financial behavior, impulse buying, and digital payment use.

2.5.1 Self-Control and Financial Behavior

Self-control is recognized as an important predictor of financial behavior and prosperity. People with stronger self-control tend to save more consistently, have better financial behavior, lower levels of financial anxiety, and feel more comfortable about their present and future financial situation (Strömbäck et al., 2017).

Financial self-control strategies have been associated with lower spending and higher saving, and both proactive strategies (implemented before encountering temptation) and reactive strategies (employed during temptation) appear to be equally effective (Davydenko et al., 2021).

Weaker self-regulation has been linked to more problematic financial outcomes. Impulsive buying is more common among individuals with greater mood-regulation needs and less effective emotion-regulation strategies, which supports the view of impulsive buying as a dysfunctional form of self-regulation (Fenton-O'Creevy et al., 2018). Higher impulsive buying has also been associated with poorer financial outcomes, while more effective emotion regulation partly reduces some of these negative financial effects (Fenton-O'Creevy et al., 2018). These findings provide a strong theoretical basis for linking perceived spending control with both impulse buying and broader spending behavior in the present study.

2.5.2 Self-Control in Digital Payment Environments

In digital commerce environments, low self-control is associated not only directly with impulse buying, but also indirectly through a more positive attitude toward targeted advertisements and greater sensitivity to the impulsive influences of social networks (Nyrhinen et al., 2024). This suggests that weak self-control in digital environments may operate partly by making consumers more receptive to persuasive online stimuli.

A perceived loss of self-control can also shape what happens after the purchase. Considering in-app purchases, lower control has been linked to stronger post-purchase regret, which in turn is associated with anger, guilt, and hiding of the purchase. This means that control-

related processes affect both impulse buying and how consumers feel afterward (Zhao et al., 2023).

2.6 Impulse Buying Behavior

2.6.1 Conceptualizing Impulse Buying

Impulse buying was initially discussed mainly in terms of unplanned purchases in retail domain. Early studies identified unplanned purchases as a substantial proportion of retail sales, while later research distinguished different forms of impulse buying and highlighted the role of situational and environmental factors such as store stimuli, ease of purchase, and reduced shopping effort. (Clover, 1950; Stern, 1962).

Rook (1987) developed the concept further by focusing on the consumer's experience of a sudden and strong urge to buy, which may be difficult to resist. This reframing moved attention away from the product itself and toward the emotional and self-regulatory experience of the consumer. Later work further showed that normative evaluations matter as well, meaning that impulsive action is influenced not only by the urge to buy, but also by consumers' judgments about whether acting on that urge is appropriate (Rook & Fisher, 1995).

Recent reviews show that the field remains fragmented, especially as impulse buying research has moved from physical retail to online and digital environments (Redine et al., 2023). Meta-analytic evidence suggests that impulse buying is shaped by a broad combination of consumer traits, motives, available resources, and marketing stimuli, while self-control and mood-related processes help explain how those factors translate into actual impulsive action (Iyer et al., 2019). A further useful distinction is between the tendency to buy impulsively and the final impulse purchase, with the former emerging as a strong predictor of the latter in online buying contexts (Anoop & Rahman, 2026).

2.6.2 Impulse Buying in Digital Wallet Context

Research on impulse buying within digital wallet contexts has expanded considerably in recent years. Among younger consumers using e-wallets, perceived enjoyment of using it has been found to positively affect impulse buying, while satisfaction did not (Lee et al.,

2022). This implies that impulse buying is influenced less by functional approval and more by emotional engagement associated with e-wallet use.

Systematic review evidence suggests that digital wallets may reduce the pain of paying while more tangible payment methods may support greater control. Hedonic motives, novelty seeking, and lapses in self-control have also been linked with digital impulse buying (Ramadhani Azka & Mulia Wibawa, 2025). These findings indicate that the way a payment is experienced may affect how easily an impulsive purchase occurs. Goel et al. (2022) provide a different example from online shopping. They found that e-impulse buying mediated the relationship between impulse-buying tendency and customer satisfaction. In other words, a consumer's underlying tendency toward impulse buying may influence later outcomes through the actual impulsive purchase itself.

A similar mechanism is relevant to digital payments. Faraz and Anjum (2025) found that reduced psychological resistance to spending can affect purchase behavior through impulse buying. Lower visibility of spending may make unplanned purchases more likely, which can in turn contribute to higher overall spending, a useful observation considering the conceptual model of the present study.

2.7 Spending Behavior

Spending behavior is considered part of the broader domain of consumer behavior and can be examined in several ways, such as purchase likelihood, willingness to pay, basket value, transaction value, and overall consumption. Payment method has also been linked with these outcomes. For instance, Feinberg (1986) showed that the payment system itself could affect both the likelihood of making a purchase and the amount spent. Also, less transparent payment methods can increase willingness to pay and reduce the resistance associated with giving up money (Prelec & Simester, 2001; Soman, 2001, 2003). For this study, spending behavior is considered specifically in relation to digital wallet use. It reflects how frequently consumers use digital wallets for purchases and how much of their spending they perceive as taking place through them, an approach consistent with previous digital payment research in which spending has been examined through more than one dimension (Aji & Adawiyah, 2022; Faraz & Anjum, 2025).

2.7.1 Digital Wallets and Spending Patterns

Digital payment research generally points to a relationship between payment technology and consumer spending, although the effect is not the same in every setting. Bian et al. (2023) found higher spending when digital wallets included internal credit options such as Buy-Now-Pay-Later (BNPL). At the same time, users reduced their use when interest charges were introduced, showing that spending control remains present under specific circumstances. Hu and Hou (2024) reported higher household consumption among mobile payment users, although the size of the effect varied according to income, household dependency, and regional characteristics. Aji and Adawiyah (2022) examined specifically e-wallet spending. They identified ease of use, promotions, self-control, and the illusion of liquidity as factors associated with spending behavior. The inclusion of self-control and perceived liquidity is important here because it moves the explanation beyond simple convenience. How consumers perceive their available money and their ability to control spending may also play a role. Faraz and Anjum (2025) approach the issue more directly from a psychological perspective. Their concept of “Spendception” describes reduced psychological resistance to spending in digital payment context and includes psychological visibility of spending, perceived spending control, ease of payment, and emotional detachment.

2.7.2 Contradictory Evidence and Boundary Conditions

The literature also includes findings that challenge a straightforward assumption that digital payments necessarily increase spending. Liu et al. (2021) found that mobile payments can increase willingness to pay compared to cash, but this effect was not uniform: the mobile-payment effect disappeared when the money used for payment was gifted. This suggests that the influence of mobile payments on spending may depend not only on the payment instrument itself, but also on how consumers mentally categorize the source of funds.

In Norway, mobile payment users have been found to be less financially vulnerable, which also incorporated difficulty in paying bills, than non-users, which contrasts with findings from some other contexts that associate digital payment use with more problematic financial outcomes (Naeser Seldal & Nyhus, 2022).

3 Research Methodology

3.1 Introduction

This chapter explains the research methodology used to examine how digital wallet-related psychological perceptions are associated with impulse buying and spending behavior. The study focused on active digital wallet users who live in Greece.

3.2 Research Design and Approach

The present study adopted a quantitative research design, using a cross-sectional questionnaire survey to collect numerical data from digital wallet users in Greece. This approach was appropriate because the study aimed to examine current perceptions and self-reported spending behavior among digital wallet users, while also testing measurable relationships between predefined variables. It also followed a deductive approach. The hypotheses were developed from prior theory and literature on pain of paying, mental accounting, perceived control, impulse buying, and spending behavior.

Primary data were collected through a structured online questionnaire distributed to consumers in Greece. The questionnaire mainly included Likert-scale items along with a small number of closed-ended questions. This allowed responses to be coded numerically and analyzed using statistical techniques.

The questionnaire was designed to measure four main constructs: Psychological Visibility of Spending, Perceived Spending Control, Impulse Buying, and Spending Behavior. These constructs were directly aligned with the conceptual model and hypotheses of the study.

3.3 Population and Sampling

The target population consisted of consumers who currently live in Greece and use digital wallets for payments. Digital wallet use referred to payments made through applications such as Apple Pay and Google Wallet. It includes payments made through these applications even when a debit or credit card is used as the funding source. It did not focus on non-users of digital wallets. This choice was consistent with the purpose of the research, as the aim

was not to compare users and non-users. Instead, it was examined how digital wallet users perceive and experience spending when using these payment methods.

A non-probability sampling approach combining convenience and snowball sampling was used. Convenience sampling allowed data collection from accessible respondents, while snowball sampling allowed respondents to share the survey with other eligible participants. This was suitable because the research required access to a specific group of respondents within a limited time period.

The study aimed to collect a sample that is adequate for correlation, regression, and mediation analysis. The sample consisted of 153 valid responses. Green's rule of thumb suggests a minimum sample size of $N \geq 50 + 8m$ for testing the overall model, where 'm' is the number of predictors, and $N \geq 104 + m$ when the focus is on testing individual predictors (Green, 1991). In this study, the core regression model includes three main predictors: Psychological Visibility of Spending, Perceived Spending Control, and Impulse Buying. The final sample of 153 therefore exceeded both recommended minimums.

3.4 Data Collection & Analysis

Data were collected through an online questionnaire created and distributed using Google Forms. An online questionnaire was practical because it enabled responses to be collected efficiently from participants in different locations. Furthermore, the research concerns digital wallet users, who are expected to be familiar with digital tools and online forms. The questionnaire was distributed primarily through personal and professional networks.

The data were analyzed using SPSS statistical software. Incomplete responses were removed before the main analysis. No response duplication was identified. Composite scores were then created by averaging the items belonging to each construct, after applying reverse coding where required.

Descriptive statistics were first used to summarise the demographic profile of respondents, digital wallet usage frequency and the mean scores of the main constructs. Reliability analysis was then conducted using Cronbach's alpha to assess the internal consistency of each multi-item scale. Pearson correlation analysis was used to examine the initial relationships between the main variables.

Simple linear regression was used to test the direct hypotheses H1 to H5. H1 and H2 examined whether Psychological Visibility of Spending and Perceived Spending Control predicted Impulse Buying. H3 examined whether Impulse Buying predicted Spending Behavior. H4 and H5 examined whether Psychological Visibility of Spending and Perceived Spending Control predicted Spending Behavior. Statistical significance was evaluated at the 5% level ($\alpha = .05$), meaning that relationships with p-values below .05 were considered statistically significant.

Multiple regression analysis was also conducted to examine the unique contribution of each predictor when the variables were considered simultaneously. The first multiple regression model predicted Impulse Buying from Psychological Visibility of Spending and Perceived Spending Control. The second multiple regression model predicted Spending Behavior from Psychological Visibility of Spending, Perceived Spending Control and Impulse Buying. This helped assess whether each variable remained significant after controlling for the others.

Mediation analysis was used to test H6 and H7. The mediation tests were conducted using Hayes' PROCESS macro for SPSS, Model 4. In the first mediation model, Psychological Visibility of Spending was entered as the independent variable, Impulse Buying as the mediator, Spending Behavior as the dependent variable and Perceived Spending Control as a covariate. In the second mediation model, Perceived Spending Control was entered as the independent variable, Impulse Buying as the mediator, Spending Behavior as the dependent variable and Psychological Visibility of Spending as a covariate. Indirect effects were tested using 5,000 bootstrap samples and 95% bootstrap confidence intervals. A mediation effect was considered statistically significant when the bootstrap confidence interval for the indirect effect did not include zero (Hayes, 2022).

3.5 Questionnaire Design

The survey opened with a short introduction explaining the purpose of the study and what was meant by digital wallet use. Participants were also informed of the eligibility criteria and were asked to continue only if they currently lived in Greece and used digital wallets for payments. The introduction also informed respondents that participation was voluntary and anonymous and that the collected data would be used only for academic purposes.

The questionnaire was divided into six parts. The first recorded the frequency of digital wallet use. Four subsequent parts measured the main constructs of the study: Psychological Visibility of Spending, Perceived Spending Control, Impulse Buying, and Spending Behavior. The final one collected demographic information, including age and personal monthly net income. Items measuring the four main constructs used a five-point Likert scale ranging from 1 (“Strongly Disagree”) to 5 (“Strongly Agree”), to keep it simple for respondents and provide enough variation for statistical analysis.

The questionnaire measured Psychological Visibility of Spending with four items. The construct refers to the extent to which digital wallet payments reduce the psychological visibility, salience, and pain of spending. It is theoretically linked to pain of paying and payment transparency.

Perceived Spending Control was measured with four items. The items captured the extent to which respondents feel able to control their budget and spending when using digital wallets. This construct is linked to self-control and financial self-regulation.

Impulse Buying was measured with four items. These items captured whether digital wallets make unplanned purchases easier, more likely, and less resisted. This construct acted as the mediator in the conceptual model.

Spending Behavior was measured with four items. These items captured respondents’ self-reported spending patterns when using digital wallets, including spending frequency, perceived spending amount, and the share of spending conducted through digital wallet payments.

Table 3.1: Measurement Items per Variable

<i>Variable</i>	<i>Code</i>	<i>Measurement Items</i>
<i>Psychological Visibility of Spending</i>	PVS1	When I pay with cash, I feel more aware of how much I am spending compared to when I pay with a digital wallet.
	PVS2	Digital wallet payments make it harder for me to realize how much money I have spent.
	PVS3	Seeing physical cash leave my hand makes me think twice before spending.
	PVS4	Paying with digital wallets feels less painful than paying with cash.
<i>Perceived Spending Control</i>	PSC1	I feel like I lose control over my budget when I rely on digital wallet payments.
	PSC2	Paying with cash helps me stick to my spending limits better than paying with digital wallets.
	PSC3	Using digital wallets makes it harder for me to control my overall spending.

	PSC4	I feel in control of my finances when using digital wallets.
<i>Impulse Buying</i>	IB1	Digital wallets make it easier for me to buy items I had not planned to purchase.
	IB2	When I use digital wallets, I sometimes buy things that I had not intended to purchase.
	IB3	I am more likely to make impulsive purchases when using digital wallets.
	IB4	Digital wallets reduce my hesitation to buy items on impulse.
<i>Spending Behavior</i>	SB1	I often use digital wallets for everyday purchases.
	SB2	I tend to spend more when paying with digital wallets compared to cash.
	SB3	A large share of my spending is made through digital wallet payments.
	SB4	I make purchases more frequently when using digital wallets.

Reliability was assessed using Cronbach's alpha. Cronbach's alpha is widely used to assess the internal consistency of multi-item scales. It is suitable when several questionnaire items are intended to measure the same underlying construct (Cronbach, 1951).

Content validity was supported by aligning the questionnaire items with the theoretical constructs and themes identified in the literature review, including payment transparency, pain of paying, self-control, impulse buying, and spending behavior. The items were designed to reflect the conceptual meaning of each construct and were assessed through internal consistency analysis using Cronbach's alpha. Although no exploratory or confirmatory factor analysis was conducted, the measurement approach was considered appropriate for the scope, sample size, and explanatory purpose of the present study.

3.6 Measurement of Variables

The study measured the main constructs through structured questionnaire items using a five-point Likert scale, ranging from 1 = Strongly Disagree to 5 = Strongly Agree. Composite scores were calculated by averaging the relevant items for each construct, after applying reverse coding where required.

In this study, the items measuring Psychological Visibility of Spending (PVS) were phrased in the reduced-visibility direction. Therefore, **higher PVS scores indicate lower psychological visibility of spending when using digital wallets**. In practical terms, a higher score means that the respondent perceives digital wallet payments as less visible, less salient, and less painful than cash payments. This coding direction is important for the

interpretation of the hypotheses. Thus, the study interprets higher PVS scores as stronger perceived reduction in spending visibility, rather than as greater visibility.

Considering Perceived Spending Control, items PSC1, PSC2, and PSC3 were phrased in the reduced-control direction, as higher agreement indicates that digital wallets make budgeting and spending control more difficult. PSC4 was phrased in the opposite direction, as it states that the respondent feels in control of their finances when using digital wallets. Therefore, PSC4 was reverse-coded before calculating the PSC composite score: reversed PSC4 = 6 – original PSC4. After reverse coding PSC4, **higher PSC scores indicate lower perceived spending control when using digital wallets**. This means that, in this study, PSC is interpreted as a measure of reduced spending control in digital wallet use.

Impulse Buying (IB) was measured through IB1 to IB4. The items were calculated as-is, because higher agreement consistently reflects a stronger tendency toward impulse buying. Higher impulse buying scores indicate that the respondent is more likely to buy items impulsively when using digital wallets.

SB1 to SB4 were used to measure Spending Behavior (SB). They captured respondents' self-reported spending patterns when using digital wallets, including spending frequency, perceived spending amount, and the share of spending conducted through digital wallet payments. The SB items were calculated as-is. Higher spending behavior score shows stronger digital wallet-related consumer spending behavior.

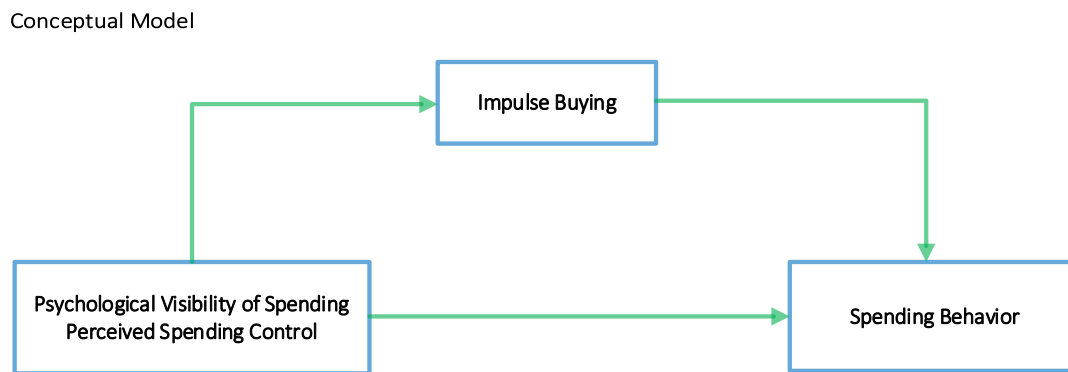
Table 3.2: Variable Coding

<i>Variable</i>	<i>Items</i>	<i>Coding</i>	<i>Interpretation of Higher Score</i>
<i>Psychological Visibility of Spending</i>	PVS1 to PVS4	as-is	Lower psychological visibility of spending when using digital wallets
<i>Perceived Spending Control</i>	PSC1 to PSC4	PSC4 reverse-coded	Lower perceived spending control when using digital wallets
<i>Impulse Buying</i>	IB1 to IB4	as-is	Higher impulse buying tendency
<i>Spending Behavior</i>	SB1 to SB4	as-is	Stronger digital wallet-related consumer spending behavior

3.7 Conceptual Model and Research Hypotheses

The conceptual framework examines how two psychological perceptions, psychological visibility of spending (PVS) and perceived spending control (PSC), influence impulse buying (IB) and spending behavior (SB) among Greek digital wallet users. Impulse buying is hypothesised to mediate the relationship between the two psychological perceptions and spending behavior.

Figure 3.1: Conceptual Model



Since higher PVS scores indicate reduced psychological visibility of spending, and higher PSC scores indicate reduced perceived spending control, the expected relationships with impulse buying and spending behavior are positive.

Hypotheses:

H1: Reduced psychological visibility of spending is positively associated with impulse buying.

H2: Reduced perceived spending control is positively associated with impulse buying.

H3: Impulse buying is positively associated with spending behavior.

H4: Reduced psychological visibility of spending is positively associated with spending behavior.

H5: Reduced perceived spending control is positively associated with spending behavior.

H6: Impulse buying mediates the relationship between reduced psychological visibility of spending and spending behavior.

H7: Impulse buying mediates the relationship between reduced perceived spending control and spending behavior.

The direct association hypotheses were initially tested using simple linear regression. This allowed each proposed relationship to be examined separately and directly. H1 and H2 tested whether Psychological Visibility of Spending and Perceived Spending Control predicted Impulse Buying. In these models, Impulse Buying was treated as the dependent variable. H3 tested whether Impulse Buying predicted Spending Behavior. H4 and H5 tested whether Psychological Visibility of Spending and Perceived Spending Control predicted Spending Behavior. In these models, Spending Behavior was treated as the dependent variable.

The expected direction of all direct relationships was positive. This is because higher PVS scores represented reduced psychological visibility of spending when using digital wallets, while higher PSC scores represented reduced perceived spending control after reverse-coding PSC4. Therefore, positive and statistically significant coefficients were interpreted as support for the relevant direct hypotheses.

In addition to the simple regression models, multiple regression analysis was conducted to examine the unique contribution of each predictor when the variables were considered simultaneously. Two multiple regression models were tested. The first model examined whether Psychological Visibility of Spending and Perceived Spending Control jointly predicted Impulse Buying. The second model examined whether Psychological Visibility of Spending, Perceived Spending Control and Impulse Buying jointly predicted Spending Behavior. This additional analysis was useful because the psychological variables were conceptually related, and multiple regression allowed the study to assess whether each predictor remained significant after controlling for the others.

The mediation hypotheses were tested to examine whether Impulse Buying explained the relationship between the psychological variables and Spending Behavior. Mediation analysis was appropriate because the conceptual model assumes that reduced psychological visibility of spending and reduced perceived spending control may influence spending behavior both directly and indirectly through impulse buying.

For H6, Psychological Visibility of Spending was entered as the independent variable, Impulse Buying as the mediator, and Spending Behavior as the dependent variable.

Perceived Spending Control was included as a covariate. This model examined whether reduced psychological visibility of spending was associated with higher impulse buying, and whether impulse buying was then associated with stronger spending behavior.

For H7, Perceived Spending Control was entered as the independent variable, Impulse Buying as the mediator, and Spending Behavior as the dependent variable. Psychological Visibility of Spending was included as a covariate. This model examined whether reduced perceived spending control was associated with higher impulse buying, and whether impulse buying was then associated with stronger spending behavior.

The mediation effects were evaluated using bootstrapped confidence intervals. An indirect effect was considered statistically significant when the 95% bootstrap confidence interval did not include zero. The mediation analysis considered the total effect, direct effect and indirect effect. For the mediation hypotheses, support was based on the statistical significance of the indirect effect through Impulse Buying.

Summary of hypotheses testing approach:

Table 3.3: Hypothesis Testing

<i>Hypothesis</i>	<i>Relationship Tested</i>	<i>Statistical Test</i>	<i>Expected Direction</i>
H1	PVS → IB	Regression analysis	Positive
H2	PSC → IB	Regression analysis	Positive
H3	IB → SB	Regression analysis	Positive
H4	PVS → SB	Regression analysis	Positive
H5	PSC → SB	Regression analysis	Positive
H6	PVS → IB → SB	Mediation analysis	Positive indirect effect
H7	PSC → IB → SB	Mediation analysis	Positive indirect effect

Note. In this study, higher PVS scores indicate reduced psychological visibility of spending when using digital wallets, and higher PSC scores indicate reduced perceived spending control after reverse-coding PSC4. Therefore, positive coefficients for PVS and PSC are interpreted as support for the expected relationships. Direct hypotheses were first examined through simple linear regression, while multiple regression was also conducted as an additional analysis to examine the unique contribution of each predictor when variables were considered simultaneously.

3.8 Ethical Considerations and Methodological Limitations

Participation in the study was voluntary. Before starting the questionnaire, participants were informed about the purpose of the research and that the collected data would be used

only for academic purposes. Responses were anonymous, and no personally identifying information, including names, email addresses, or contact details, was collected.

The study has several methodological limitations: The cross-sectional design means that data were collected at one point in time. This limits the ability to make causal claims. The study can identify statistical relationships, but it cannot prove that digital wallets directly cause higher spending.

Furthermore, the study relies on self-reported data. Respondents may not accurately remember their spending behavior. They may also underreport impulsive or excessive spending. Therefore, the findings should be interpreted as evidence of perceived and self-reported spending behavior rather than objective transaction behavior. In addition, because all variables were measured using the same self-report questionnaire at a single point in time, the results may be affected by common method bias.

Finally, the use of convenience and snowball sampling limits generalisability. The final sample may overrepresent digitally active consumers. It may also underrepresent older consumers or consumers who use digital wallets less frequently. Furthermore, it does not fully represent the whole population of digital wallet users in Greece.

4 Data Analysis and Findings

4.1 Sample Profile

Participants profile:

Table 4.1: Participants Profile

Variable	Result
Valid Responses	153
Age Mean	39.33
Age Median	41
Age Range	18-56

The sample is mainly composed of adults in early to middle adulthood, with an average age close to 39 and a median age of 41.

Digital Wallet Usage Frequency:

Table 4.2: Digital Wallet Usage Frequency

Usage Frequency	n	Percent
Daily	82	53.60%
Several times per week	33	21.60%
About once per week	12	7.80%
A few times per month	11	7.20%
Rarely	15	9.80%

The sample mainly consists of frequent digital wallet users. More than half of respondents use digital wallets daily, and another 21.6% use them several times per week. Combined, 75.2% of the sample uses digital wallets daily or several times per week.

Income:

Table 4.3: Participants Income Distribution

Approximate personal monthly net income	Frequency	Percent
No personal income	5	3.30%
Up to €1000	18	11.80%
€1000-€1500	49	32.00%
€1500-€2000	22	14.40%
€2000-€2500	25	16.30%
More than €2500	16	10.50%
Prefer not to say	18	11.80%
Total	153	100.00%

The figure shows that the majority of the participants reported a monthly net income between €1000 and €1500, representing 32.0% of the full sample, which mainly consists of people with low to middle and middle income levels.

4.2 Descriptive Statistics & Normality

Table 4.4: Variable Descriptive Statistics

Construct	Mean	SD	Skewness	Kurtosis	Min	Max
Psychological Visibility of Spending	3.22	0.95	-0.145	-0.702	1	5
Perceived Spending Control	2.88	1.00	-0.05	-1.018	1	5
Impulse Buying	3.21	0.94	-0.444	-0.404	1	5
Spending Behavior	3.59	0.84	-0.643	0.755	1	5

Descriptive statistics show that Spending Behavior had the highest mean among the constructs ($M = 3.59$, $SD = 0.84$), revealing relatively strong spending behavior among respondents, while Psychological Visibility of Spending ($M = 3.22$, $SD = 0.95$) and Impulse Buying ($M = 3.21$, $SD = 0.94$) show moderate levels of reduced spending visibility and impulse buying tendencies. Perceived Spending Control had a slightly lower mean ($M = 2.88$, $SD = 1.00$), suggesting that reduced perceived control over spending was present but less strongly expressed. The standard deviation values indicate moderate variability across respondents.

The distributions of the main variables were examined using histograms, normal probability plots, skewness and kurtosis. Skewness values ranged from -0.643 to -0.050, while kurtosis ranged from -1.018 to 0.755. These values fall within accepted thresholds for behavioral research (approximately between -2 and +2), indicating no severe deviations from normality.

4.3 Reliability

Table below shows Cronbach's alpha coefficients for all constructs:

Table 4.5: Cronbach's alpha

Construct	Items	Cronbach's α	Result Interpretation
Psychological Visibility of Spending	4	0.792	Acceptable to Good
Perceived Spending Control	4	0.899	Good to Excellent
Impulse Buying	4	0.867	Good
Spending Behavior	4	0.703	Acceptable

Cronbach's alpha was used to assess the internal consistency of each multi-item scale. The results showed acceptable to good reliability across all constructs. Psychological visibility of spending showed acceptable to good reliability, perceived spending control good to excellent and impulse buying good. Finally, spending behavior produced an alpha of .703, which is acceptable.

4.4 Correlation Analysis

Pearson correlation analysis examined the bivariate relationships between the main variables: Psychological Visibility of Spending, Perceived Spending Control, Impulse Buying, and Spending Behavior. The Pearson correlation coefficient (r), ranges from -1 to +1. A positive value means that when one variable increases, the other also tends to increase. A negative value means that when one variable increases, the other tends to decrease. The closer the value is to 1 or -1, the stronger the relationship. The results are presented in the table below. All correlations were positive and statistically significant.

Table 4.6: Pearson Correlation Analysis

Relationship	Pearson r	p-value	Strength of Relationship
PVS - IB	0.631	< .001	Strong positive relationship
PSC - IB	0.623	< .001	Strong positive relationship
IB - SB	0.387	< .001	Moderate positive relationship
PVS - SB	0.352	< .001	Moderate positive relationship
PSC - SB	0.207	= .010	Weak positive relationship
PVS - PSC	0.803	< .001	Strong positive relationship

A strong positive correlation was found between Psychological Visibility of Spending and Perceived Spending Control, with $r = 0.803$ and $p < 0.001$. This indicates that the two constructs are strongly associated, meaning that respondents who report reduced spending visibility also tend to report reduced spending control. This is considered later on, during regression and mediation analysis results.

Psychological Visibility of Spending was positively and significantly correlated with Impulse Buying ($r = .631, p < .001$), and with Spending Behavior ($r = .352, p < .001$). Given that higher PVS scores indicate reduced psychological visibility of spending when using digital wallets, these findings suggest that reduced visibility of spending is associated with stronger impulse buying tendencies and higher spending behavior.

Perceived Spending Control was also positively and significantly correlated with both Impulse Buying and Spending Behavior. The relationship with Impulse Buying was strong, whereas the relationship with Spending Behavior was comparatively weaker. Since higher PSC scores in this study reflect greater difficulty in controlling spending when using digital wallets, this suggests that reduced spending control is associated with higher impulse buying and, to a weaker extent, higher spending behavior.

Finally, Impulse Buying was positively and significantly correlated with Spending Behavior ($r = .387, p < .001$), meaning that respondents with stronger impulse buying tendencies also reported higher digital wallet spending behavior.

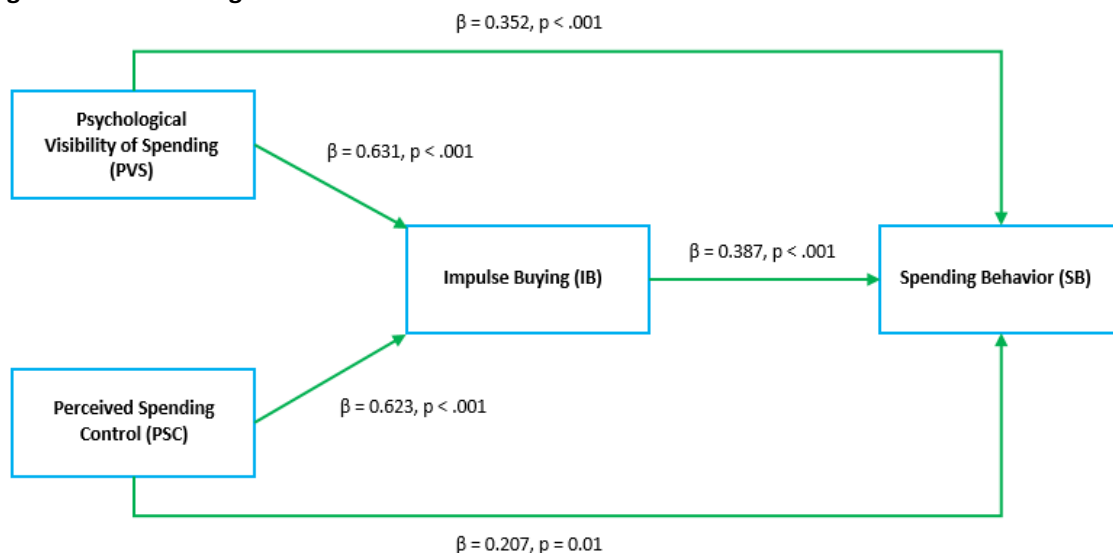
4.5 Linear Regression

Linear regression analysis was conducted to examine whether the independent variables significantly predicted the proposed dependent variables. Statistical significance was evaluated at the 5% significance level ($\alpha = 0.05$). All five relationships were statistically significant in simple regression analysis. The results are presented in table 4.7.

Table 4.7: Linear Regression

Relationship	B	β	R^2	F(1, 151)	p	Result
PVS $\rightarrow$ IB	0.625	0.631	0.399	100.153	< 0.001	Supported
PSC $\rightarrow$ IB	0.586	0.623	0.389	95.941	< 0.001	Supported
IB $\rightarrow$ SB	0.344	0.387	0.15	26.582	< 0.001	Supported
PVS $\rightarrow$ SB	0.310	0.352	0.124	21.412	< 0.001	Supported
PSC $\rightarrow$ SB	0.173	0.207	0.043	6.757	= 0.01	Supported, weak

Figure 4.1: Linear Regression



The results showed that Psychological Visibility of Spending significantly predicted Impulse Buying ($F(1,151) = 100.153, p < .001$). The relationship was strong and positive ($\beta = 0.631$) with PVS explaining 39.9% of the variance in Impulse Buying ($R^2 = 0.399$),

meaning that respondents who perceived digital wallet payments as less psychologically visible were more likely to report impulse buying tendencies.

A similarly strong relationship was observed between Perceived Spending Control and Impulse Buying. The regression model was statistically significant ($F(1,151) = 95.941, p < .001$), while the standardized coefficient was positive and strong ($\beta = 0.623$). PSC accounted for 38.9% of the variance in IB ($R^2 = .389$). People who experienced lower perceived control over spending when using digital wallets were more likely to report greater impulse buying. Impulse Buying also significantly predicted Spending Behavior ($F(1,151) = 26.582, p < .001$). In this case, there was a moderate positive association with SB ($\beta = 0.387$) and accounted for 15.0% of its variance ($R^2 = 0.150$), indicating that respondents with higher impulse buying tendencies also reported higher spending behavior related to digital wallets.

For Psychological Visibility of Spending and Spending Behavior, the regression was again statistically significant ($F(1,151) = 21.412, p < .001$). PVS showed a moderate positive relationship with Spending Behavior ($\beta = 0.352$) and explained 12.4% of its variance ($R^2 = 0.124$). Since higher PVS scores represent lower spending visibility, the result indicates that lower psychological visibility was associated with higher spending behavior.

Perceived Spending Control significantly predicted Spending Behavior ($F(1,151) = 6.757, p = .010$). However, the association was positive but weak compared with the other regression paths ($\beta = 0.207$), with PSC accounting for only 4.3% of the variance in Spending Behavior ($R^2 = 0.043$). The findings suggest that respondents who experienced lower perceived control over spending when using digital wallets were slightly more likely to report higher spending behavior.

The simple regression results support the proposed direct relationships among the study variables. The findings show that reduced psychological visibility of spending and lower perceived spending control are strong predictors of impulse buying. Their direct effects on spending behavior are also significant, although they were more moderate for PVS and IB, and weak in the case of PSC. This suggests that impulse buying may play an important explanatory role in the relationship between digital-wallet-related psychological perceptions and spending outcomes.

4.6 Multiple Regression

Multiple regression analysis was conducted to examine the combined and unique effects of the main predictors. Unlike simple regression, which tests each relationship separately, multiple regression allows the effect of each predictor to be assessed while controlling for the other variables in the model. Two models were tested:

Model 1 - Predicting Impulse Buying: Dependent Variable: Impulse Buying. Predictors: Psychological Visibility of Spending and Perceived Spending Control

Model 2 - Predicting Spending Behavior: Dependent Variable: Spending Behavior. Predictors: Psychological Visibility of Spending, Perceived Spending Control and Impulse Buying

Table 4.8: Multiple Regression Model Summary

Model	Dependent Variable	Predictors	R	R ²	Adjusted R ²	F	p-value
1	IB	PVS, PSC	0.661	0.437	0.429	58.157	< 0.001
2	SB	PVS, PSC, IB	0.452	0.204	0.188	12.737	< 0.001

Multiple Regression Coefficients:

Table 4.9: Multiple Regression

Dependent Variable	Predictor	B	SE	β	t	p-value	95% CI for B	VIF
IB	PVS	0.365	0.102	0.369	3.584	<0.001	[.164, .566]	2.818
IB	PSC	0.308	0.097	0.327	3.180	0.002	[.116, .499]	2.818
SB	PVS	0.353	0.113	0.401	3.135	0.002	[.131, .576]	3.060
SB	PSC	-0.271	0.106	-0.324	-2.559	0.012	[-.481, -.062]	3.008
SB	IB	0.299	0.087	0.336	3.450	< 0.001	[.128, .471]	1.775

The adjusted R² values were close to the corresponding R² values in both models, suggesting limited overfitting and acceptable model stability.

Model 1 - Predicting Impulse Buying

A multiple regression analysis was conducted to examine whether psychological visibility of spending and perceived spending control jointly predicted impulse buying. The full model was statistically significant ($F(2, 150) = 58.157, p < 0.001$), and explained 43.7% of the variance in impulse buying ($R^2 = 0.437$). Both predictors made significant unique

contributions to the model. Psychological visibility of spending positively predicted impulse buying ($B = 0.365$, $\beta = 0.369$, $t = 3.584$, $p < .001$, 95% CI [.164, .566]). Perceived spending control was also positively associated with impulse buying ($B = 0.308$, $\beta = 0.327$, $t = 3.180$, $p = 0.002$, 95% CI [.116, .499]). These findings indicate that both reduced psychological visibility of spending and lower perceived spending control are associated with higher levels of impulse buying when considered simultaneously.

Model 2 - Predicting Spending Behavior

A multiple regression analysis was conducted to examine whether psychological visibility of spending, perceived spending control, and impulse buying jointly predicted spending behavior. The overall model was statistically significant ($F(3, 149) = 12.737$, $p < .001$), and explained 20.4% of the variance in spending behavior ($R^2 = 0.204$). Psychological visibility of spending was a significant positive predictor of spending behavior ($B = 0.353$, $\beta = 0.401$, $t = 3.135$, $p = 0.002$, 95% CI [.131, .576]). Impulse buying was also a significant positive predictor ($B = 0.299$, $\beta = 0.336$, $t = 3.450$, $p < 0.001$, 95% CI [.128, .471]). However, perceived spending control showed a significant negative coefficient in the full model ($B = -.271$, $\beta = -.324$, $t = -2.559$, $p = .012$, 95% CI [-.481, -.062]). This means that, after PVS and IB are held constant, higher PSC scores, which indicate reduced perceived spending control, are associated with lower spending behavior. Once these related predictors are controlled, the remaining unique component of perceived spending control may reflect a different aspect of respondents' behavior resulting to change of the direction. The direct effect of perceived spending control on spending behavior is considered as complex. It is further analyzed during the incorporation of the mediation results and ultimately in the discussion chapter.

Finally, the strong relationship between psychological visibility of spending and perceived spending control may also play an important role: Although the two are conceptually distinct, they are correlated at $r = 0.803$, indicating a notable statistical overlap. Respondents who felt that digital wallets made spending less visible also tended to feel less in control. This suggests a possible suppression pattern.

Collinearity statistics were also examined. VIF values ranged from 1.775 to 3.060, which is below the commonly used threshold of 5. Multicollinearity was therefore not considered

severe, although some overlap between predictors was present. This is reasonable given that PVS, PSC, and IB refer to related aspects of digital-wallet spending behavior.

Multiple regression confirms that PVS and PSC significantly predict impulse buying, and that PVS and IB significantly predict spending behavior. However, the direct role of PSC in spending behavior is more complex, as its coefficient becomes negative after controlling for PVS and IB.

4.7 Mediation Analysis

Mediation analysis was conducted using PROCESS macro for SPSS, Model 4. Two mediation models were estimated: In the first model, Psychological Visibility of Spending (PVS) was the independent variable and Perceived Spending Control (PSC) was a covariate. In the second one, Perceived Spending Control (PSC) was the independent variable and Psychological Visibility of Spending (PVS) was a covariate. Indirect effects were tested using 5,000 bootstrap samples and 95% percentile bootstrap confidence intervals. An indirect effect was considered statistically significant when the bootstrap confidence interval did not include zero.

In the interpretation of the results, it is important to note that higher PVS scores indicate **reduced psychological visibility of spending** when using digital wallets. Similarly, based on the coding of the PSC items, higher PSC scores should be interpreted as reflecting **greater difficulty controlling spending** when using digital wallets.

4.7.1 Mediation effect of Impulse Buying between PVS and SB

Table 4.10: Mediation Path Coefficients for PVS, IB, and SB

Path	B	SE / BootSE	t	p-value	95% CI
PVS → IB	0.365	0.102	3.584	< .001	[.164, .566]
IB → SB	0.299	0.087	3.45	< .001	[.128, .471]

Table 4.11: Mediation Effects of PVS on SB through IB

Effect	B	SE / BootSE	95% CI	Interpretation
Total effect: PVS → SB	0.462	0.112	[.241, .683]	Significant
Direct effect: PVS → SB	0.353	0.113	[.131, .576]	Significant
Indirect effect: PVS → IB → SB	0.109	0.043	[.039, .206]	Significant

The mediator model predicting Impulse Buying was statistically significant ($R^2 = .437$, $F(2,150) = 58.157$, $p < .001$). Psychological Visibility of Spending had a significant positive effect on Impulse Buying ($B = .365$, $SE = .102$, $t = 3.584$, $p < .001$, 95% CI [.164, .566]). Higher PVS scores were therefore associated with higher levels of impulse buying. Since higher PVS scores indicate reduced psychological visibility of spending, this observation shows that when digital wallet payments make spending feel less visible or less salient, consumers are more likely to report impulse buying.

The outcome model predicting Spending Behavior was also statistically significant ($R^2 = .204$, $F(3,149) = 12.737$, $p < .001$). Impulse Buying significantly predicted Spending Behavior ($B = .299$, $SE = .087$, $t = 3.450$, $p < .001$, 95% CI [.128, .471]). Psychological Visibility of Spending also remained a significant direct predictor of Spending Behavior after including the mediator ($B = .353$, $SE = .113$, $t = 3.135$, $p = .002$, 95% CI [.131, .576]).

The total effect of Psychological Visibility of Spending on Spending Behavior was significant ($B = .462$, $SE = .112$, $t = 4.129$, $p < .001$, 95% CI [.241, .683]). The indirect effect of PVS on SB through Impulse Buying was also significant ($B = .109$, $BootSE = .043$, 95% bootstrap CI [.039, .206]). Since the confidence interval did not include zero, the mediation effect was supported. However, because the direct effect remained significant after including Impulse Buying, **the results indicate partial mediation.**

The findings suggest that reduced psychological visibility of spending is associated with higher spending behavior both directly and indirectly through impulse buying. Therefore, the mediation hypothesis for the path $PVS \rightarrow IB \rightarrow SB$ is supported.

4.7.2 Mediation effect of Impulse Buying between PSC and SB

Table 4.12: Mediation Path Coefficients for PSC, IB, and SB

Path	B	SE / BootSE	t	p-value	95% CI
PSC $\rightarrow$ IB	0.308	0.097	3.18	0.002	[.116, .499]
IB $\rightarrow$ SB	0.299	0.087	3.45	<.001	[.128, .471]

Table 4.13: Mediation Effects of PSC on SB through IB

Effect	B	SE / BootSE	t	p	95% CI
Total effect: PSC $\rightarrow$ SB	-0.180	0.106	-1.688	0.094	[-.390, .031]

Direct effect: PSC → SB	-0.271	0.106	-2.559	0.012	[-.481, -.062]
Indirect effect: PSC → IB → SB	0.092	0.035	-	-	[.029, .167]

A mediation analysis was conducted using PROCESS Model 4 to examine whether Impulse Buying mediated the relationship between Perceived Spending Control and Spending Behavior, while controlling for Psychological Visibility of Spending. The analysis was based on 153 valid responses.

The mediator model predicting Impulse Buying was statistically significant ($R^2 = .437$, $F(2,150) = 58.157$, $p < .001$). Perceived Spending Control significantly predicted Impulse Buying ($B = .308$, $SE = .097$, $t = 3.180$, $p = .002$, 95% CI [.116, .499]). This means that higher PSC scores were associated with higher impulse buying. Given the coding of the PSC, the result suggests that respondents who experienced lower perceived spending control when using digital wallets were more likely to report impulse buying.

The total effect of Perceived Spending Control on Spending Behavior was not statistically significant ($B = -.180$, $SE = .106$, $t = -1.688$, $p = .094$, 95% CI [-.390, .031]). However, the direct effect of PSC on SB became statistically significant and negative after including IB and PVS in the model ($B = -.271$, $SE = .106$, $t = -2.559$, $p = .012$, 95% CI [-.481, -.062]). The indirect effect of Perceived Spending Control on Spending Behavior through Impulse Buying was significant ($B = .092$, $BootSE = .035$, 95% bootstrap CI [.029, .167]). Since the confidence interval did not include zero, the mediation effect was supported. However, this model should not be described as simple partial mediation. The indirect effect was positive, while the direct effect was negative. This indicates an inconsistent mediation pattern, meaning that Perceived Spending Control was positively associated with Spending Behavior indirectly through Impulse Buying, but its remaining direct association with Spending Behavior was negative after controlling for IB and PVS.

The results support the mediation hypothesis at the indirect-effect level. Lower perceived spending control was associated with higher impulse buying, and impulse buying was associated with higher spending behavior. However, the total effect of PSC on SB was not significant and the direct effect was negative. The findings suggest that reduced perceived spending control is more strongly related to spending behavior through impulse buying than through a direct effect. One possible explanation is that perceived loss of control mainly contributes to unplanned or impulsive purchases, rather than to overall digital-wallet-related

spending behavior. Another possible explanation is that consumers who are aware of reduced spending control may compensate by monitoring and limiting their spending. The result may also reflect some overlap between perceived spending control and psychological visibility of spending: The correlation between PVS and PSC is high ($r = .803$), which means that the two variables are statistically connected. Respondents who feel that digital wallets make spending less visible also tend to feel less in control. Because of this overlap, when both variables are entered into the same model, PSC may lose its simple meaning and capture only the remaining part of perceived control after this overlap is removed. This is further elaborated in the discussion chapter.

4.7.3 Summary of mediation findings

The mediation analysis provides evidence that Impulse Buying plays an important mediating role in the relationship between digital wallet-related psychological perceptions and spending behavior. Both mediation models produced statistically significant indirect effects, as the 95% bootstrap confidence intervals did not include zero.

The first model showed a clear and consistent mediation pattern. Psychological Visibility of Spending had a significant total effect on Spending Behavior, a significant direct effect on Spending Behavior, and a significant indirect effect through Impulse Buying. Therefore, the relationship between reduced psychological visibility of spending and spending behavior was **partially mediated by impulse buying**.

The second model also showed a significant indirect effect through IB. However, the total effect of Perceived Spending Control on Spending Behavior was not statistically significant, and the direct effect became negative after including Impulse Buying and Psychological Visibility of Spending. Therefore, the Perceived Spending Control mediation path should be interpreted cautiously, as discussed in 4.7.2.

4.8 Hypothesis Summary

The purpose of the hypothesis testing was to examine whether reduced psychological visibility of spending, reduced perceived spending control, and impulse buying are associated with digital-wallet-related spending behavior. The results provide support for

most of the proposed relationships. The strongest findings concern the relationships between reduced psychological visibility of spending, reduced perceived spending control, and impulse buying. The findings also show that impulse buying plays an important mediating role, although the mediation pattern differs between the two independent variables.

Summary of the hypothesis testing:

Table 4.14: Hypothesis Summary

Hypothesis	Relationship Tested	Evidence	Result
H1	Reduced psychological visibility of spending is positively associated with impulse buying.	PVS significantly predicted IB, $\beta = .631$, $p < .001$.	Supported
H2	Reduced perceived spending control is positively associated with impulse buying.	PSC significantly predicted IB, $\beta = .623$, $p < .001$.	Supported
H3	Impulse buying is positively associated with spending behavior.	IB significantly predicted SB, $\beta = .387$, $p < .001$.	Supported
H4	Reduced psychological visibility of spending is positively associated with spending behavior.	PVS significantly predicted SB, $\beta = .352$, $p < .001$.	Supported
H5	Reduced perceived spending control is positively associated with spending behavior.	PSC significantly predicted SB in the simple regression, $\beta = .207$, $p = .010$, but the relationship became negative in the full model.	Partially supported
H6	Impulse buying mediates the relationship between reduced psychological visibility of spending and spending behavior.	The indirect effect was significant, $B = .109$, 95% bootstrap CI [.039, .206]. The direct effect remained significant.	Supported/ Partial mediation
H7	Impulse buying mediates the relationship between reduced perceived spending control and spending behavior.	The indirect effect was significant, $B = .092$, 95% bootstrap CI [.029, .167], but the direct effect was negative and the total effect was not significant.	Supported at the indirect-effect level, with an inconsistent mediation pattern

The results show that **H1** was supported. Reduced psychological visibility of spending was positively associated with impulse buying. This means that respondents who perceived

digital wallet payments as less visible, less salient, or less psychologically painful were more likely to report impulse buying tendencies. This was one of the strongest relationships in the analysis.

H2 was also supported. Reduced perceived spending control was positively associated with impulse buying, indicating that respondents who felt less able to control their spending when using digital wallets were more likely to report impulsive purchasing. Together, H1 and H2 suggest that digital-wallet-related psychological perceptions are important predictors of impulse buying.

H3 was supported, as impulse buying was positively associated with spending behavior. Respondents with stronger impulse buying tendencies also reported higher digital-wallet-related spending behavior.

H4 was supported. Reduced psychological visibility of spending was positively associated with spending behavior. This suggests that respondents who perceived digital wallet payments as less visible, less salient, or less psychologically painful were more likely to report higher spending behavior. This relationship also remained significant in the mediation model, indicating that PVS has both a direct relationship with spending behavior and an indirect relationship through impulse buying.

H5 was weakly supported in the simple regression, but not supported as a stable direct relationship in the full model: In the simple regression analysis, reduced perceived spending control was positively and significantly associated with spending behavior. However, this effect was weak, and the relationship changed direction in the multiple regression and mediation models after controlling for psychological visibility of spending and impulse buying. Therefore, H5 is not considered as a strong or straightforward finding. Instead, the results suggest that the relationship between reduced perceived spending control and spending behavior is more complex.

H6 was supported. The mediation analysis showed that impulse buying significantly mediated the relationship between reduced psychological visibility of spending and spending behavior. Since both the indirect effect and the direct effect were significant, this indicates partial mediation.

H7 was supported at the indirect-effect level, but not as a straightforward direct relationship: The indirect effect of reduced perceived spending control on spending behavior through

impulse buying was statistically significant. This means that reduced spending control was associated with higher impulse buying, which in turn was associated with higher spending behavior. However, the total effect of PSC on spending behavior was not significant, and the direct effect became negative after including impulse buying and psychological visibility of spending in the model. Therefore, this result should be interpreted as inconsistent mediation and is further discussed in detail in the last chapter. Perceived Spending Control is linked to spending behavior primarily through impulse buying, while its direct association with spending behavior is more complex, as discussed in 4.7.2 and 4.7.3.

The hypothesis testing results show that impulse buying is a key mechanism between digital-wallet-related psychological perceptions and spending behavior. The findings provide stronger support for the role of reduced psychological visibility of spending than for reduced perceived spending control. While perceived spending control is clearly related to impulse buying, its direct relationship with spending behavior is more complex and should be interpreted cautiously. The overall results suggest that digital wallets may influence consumer spending behavior partly because they reduce the psychological visibility of spending and encourage impulse buying.

5 Discussion, Conclusions and Recommendations

5.1 Discussion of Findings

Considering psychological visibility of spending, the results showed that lower spending visibility was strongly associated with impulse buying and increased spending behavior. Therefore, H1 and H4 were supported. This also addresses the first research question, which examined how psychological visibility of spending in digital wallet transactions influences impulse buying and spending behavior. The result aligns with pain of paying theory, which suggests that less visible or less salient payments reduce the psychological discomfort associated with spending, therefore weakening one of the psychological restraints on impulsive purchases (Prelec & Loewenstein, 1998). It is also consistent with the payment transparency concept, where less transparent payment methods consistently produce higher spending (Soman, 2003). It also aligns with the Spendception framework (Faraz & Anjum,

2025) and the cashless effect, which refers to the tendency of consumers to spend more when using non-cash payment methods compared with cash (Schomburgk et al., 2024).

It is also observed that reduced perceived spending control was strongly associated with impulse buying, thus supporting the second hypothesis. Consumers who feel less able to control their spending when using digital wallets are more likely to report impulsive purchasing. This is consistent with self-regulation theory, which links lower self-control to a stronger tendency toward impulse buying (Vohs & Faber, 2007; Baumeister et al., 2007). It is also aligned with recent research showing that low self-control in digital environments increases impulse buying (Nyrhinen et al., 2024).

However, the relationship between perceived spending control and overall spending behavior was more complex. In the simple regression analysis it was positive but weak. In the full model, after psychological visibility of spending and impulse buying were included, the direct relationship became negative. This means that perceived spending control should not be interpreted as a simple direct predictor of spending behavior. Its strongest and clearest role appears to be indirect: Reduced perceived spending control was linked to higher impulse buying, and impulse buying was linked to higher spending behavior. This suggests that reduced control may affect spending mainly through impulsive purchases, rather than through spending behavior in a direct way. One possible explanation for this finding is that consumers who feel less in control may express this through unplanned and impulsive purchases, rather than through other dimensions of spending. Also, they may try to compensate: For example, they may monitor their account more closely, reduce some planned spending and in general become more cautious after noticing impulsive behavior. Another explanation is the strong statistical overlap between perceived spending control and psychological visibility of spending, despite their conceptual distinction: Consumers who feel that digital wallet payments make spending less visible may also feel less in control. Because the two perceptions are closely related, the unique effect of perceived spending control becomes harder to interpret when both are included in the same model. In more technical terms, the stronger predictor, which is PVS, absorbs the shared variance, leaving PSC to capture only the leftover portion that is unique to it. This remaining component may represent something narrower than the original PSC that results to coefficient change of direction in the full model. To conclude, reduced spending control matters, but it mainly matters because it is connected with impulse buying.

The third hypothesis was supported, since impulse buying significantly predicted spending behavior. Respondents with stronger impulse buying tendencies reported higher spending related with digital wallets. This is consistent with impulse buying theory, which defines impulse buying as a sudden and powerful urge that may result in actual purchase behavior (Rook, 1987). It is also aligned with recent digital payment research which suggests that impulse buying had a significant positive impact on consumer purchase behavior (Faraz & Anjum, 2025).

Impulse buying also provides the link between the psychological perceptions and spending behavior. This addresses the third research question, which examined the extent to which impulse buying mediates the relationship between psychological perceptions of digital wallet payments and spending behavior. The findings showed that impulse buying mediated both psychological paths, although not exactly in the same way: For the sixth hypothesis (H6), which considers impulse buying mediation on the relationship between reduced psychological visibility of spending and spending behavior, the indirect effect of reduced psychological visibility of spending on spending behavior through impulse buying was significant with a significant direct effect, indicating partial mediation. This is consistent with Spendception (Faraz & Anjum, 2025). For the last hypothesis (H7), which refers to impulse buying mediation on the relationship between reduced perceived spending control and spending behavior, the indirect effect of reduced perceived spending control was also significant, but the total effect was not, and the direct effect was negative. This indicates inconsistent mediation, where the path operates mainly through impulse buying. A non-significant total effect does not rule out mediation, since the accepted criterion is a bootstrapped indirect effect whose interval excludes zero. In addition, the positive indirect path and the negative direct path act in opposite directions, which can partly cancel each other out, and suppress the total effect (Hayes, 2022; Zhao et al., 2010).

5.2 Theoretical Contributions and Practical Implications

The main contribution of the present study is that it addresses a gap in the very limited literature on the relationship between digital wallets and spending behavior in Greece, by applying payment psychology concepts to the Greek digital wallet landscape. In addition, it provides empirical support for pain of paying and payment transparency theory in the digital

wallet context (Prelec & Loewenstein, 1998; Soman, 2003) and it also supports impulse buying as a mediator between payment-related psychological perceptions and spending behavior, consistent with the Spendception framework (Faraz & Anjum, 2025).

The observations have practical implications for consumers, suggesting that digital wallets should be used with awareness. The convenience of digital wallets is valuable, but it may also reduce the visibility of spending. Setting spending limits and using budgeting tools to make digital spending more visible may be beneficial. Digital wallet providers could also consider features that increase spending salience. The findings may also be relevant to policymakers, as they realize that digital wallet payments are not only technical tools, but can also influence consumer awareness, impulse buying, and spending control. This could support financial literacy efforts and consumer protection discussions as digital payments continue to expand.

5.3 Limitations

Several limitations should be considered when interpreting the findings. The cross-sectional design does not allow causal conclusions about the relationships between the study variables and all of them were measured through self-report, which carries risks of recall error and common method bias. The findings reflect respondents' perceptions and reported spending behavior, not objective transaction records. In addition, the sample was recruited through convenience and snowball sampling. Although this was adequate for the statistical analysis performed, it cannot be assumed that represents the wider population of digital wallet users in Greece. The online distribution method may also have attracted individuals who are more familiar with digital technologies and electronic payments. Finally, the study focused exclusively on digital wallet users living in Greece, limiting geographical and cultural diversity.

5.4 Recommendations for Future Research

Future research could address these limitations in several ways. Longitudinal studies, for example, could examine whether and how digital wallet use affects spending behavior over

time. Future work could also use transaction data from bank statements and digital wallet records, thus allowing comparisons between perceived and actual spending.

The relationships examined in this dissertation may also differ across consumer groups. Age, gender, and income could be examined as moderators in larger samples. Extending the research beyond Greece would provide a useful comparison with countries where digital payment adoption and consumer attitudes may differ. Research at platform level could also explore whether particular wallet features, like spending notifications, transaction summaries, or interface design, affect spending visibility and perceived control.

A qualitative approach could provide deeper insight into how consumers experience digital wallet payments. Interviews or focus groups could explore how people describe the feeling of paying with digital wallets, how they monitor spending, and how they react after impulsive purchases.

5.5 Conclusion

This dissertation examined the impact of digital wallets on consumer spending behavior in Greece, focusing on psychological mechanisms. Data from 153 active digital wallet users showed that reduced psychological visibility of spending and lower perceived spending control were both strongly associated with greater impulse buying. Impulse buying in turn was positively related to spending behavior. Lower psychological visibility of spending also showed a positive direct relationship with spending behavior, while the role of perceived spending control was more complex and operated mainly through impulse buying.

Overall, the outcomes support the argument that psychological perceptions associated with digital wallet payments are related to consumer spending behavior, both directly and through impulse buying. The study also provided evidence from Greece, where research on spending behavior through digital wallets is limited. The findings may be useful to consumers, payment providers and policymakers as digital payments continue to expand.

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Appendix A: Questionnaire

Note: Questions Q2–Q17 were measured using a five-point Likert scale, with response options ranging from Strongly Disagree (1) to Strongly Agree (5): Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, and Strongly Agree.

1. Q1. How often do you use a digital wallet for purchases?
 - ☐ Daily
 - ☐ Several times per week
 - ☐ About once per week
 - ☐ A few times per month
 - ☐ Rarely
2. Q2. When I pay with cash, I feel more aware of how much I am spending compared to when I pay with a digital wallet.
3. Q3. Digital wallet payments make it harder for me to realize how much money I have spent.
4. Q4. Seeing physical cash leave my hand makes me think twice before spending.
5. Q5. Paying with digital wallets feels less painful than paying with cash.
6. Q6. I feel like I lose control over my budget when I rely on digital wallet payments.
7. Q7. Paying with cash helps me stick to my spending limits better than paying with digital wallets.
8. Q8. Using digital wallets makes it harder for me to control my overall spending.
9. Q9. I feel in control of my finances when using digital wallets.
10. Q10. Digital wallets make it easier for me to buy items I had not planned to purchase.
11. Q11. When I use digital wallets, I sometimes buy things that I had not intended to purchase.

12. Q12. I am more likely to make impulsive purchases when using digital wallets.
13. Q13. Digital wallets reduce my hesitation to buy items on impulse.
14. Q14. I often use digital wallets for everyday purchases.
15. Q15. I tend to spend more when paying with digital wallets compared to cash.
16. Q16. A large share of my spending is made through digital wallet payments.
17. Q17. I make purchases more frequently when using digital wallets.
18. Q18. What is your age?
(Please enter your age in years – numeric only)
-
19. Q19. What is your approximate personal monthly net income?
- ☐ No personal income
 - ☐ Up to €1,000
 - ☐ €1,000–€1,500
 - ☐ €1,500–€2,000
 - ☐ €2,000–€2,500
 - ☐ More than €2,500
 - ☐ Prefer not to say

Author's Statement:

I hereby expressly declare that, according to the article 8 of Law 1559/1986, this dissertation is solely the product of my personal work, does not infringe any intellectual property, personality and personal data rights of third parties, does not contain works/contributions from third parties for which the permission of the authors/beneficiaries is required, is not the product of partial or total plagiarism, and that the sources used are limited to the literature references alone and meet the rules of scientific citations.