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Unfasten the Gender Divide: The study of Innovative User Engagement, Self-Congruity and Playfulness for Higher Technology Adoption Intentions

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Abstract

This study analyses how consumers choose to accept a radical or gradual innovation or stick with a ubiquitous computing device. Self-congruity theory, user engagement, innovativeness, and fun are examined. This research presents its findings. UCD users in Karachi who were educated urban inhabitants aged 18–35 were asked survey questions for the research. Convenience or self-selection selected these persons. AMOS 23 was used to code questionnaire results. Focused attention, interaction attractiveness, and perceived usability are the most important UCD user engagement factors. The first two boost playfulness and self-concept. Innovative customers adopt new gadgets, whereas non-innovative customers stick to what they know. Gender moderation shows that engagement, fun, and self-congruity promote innovation uptake. This study contributes to theory by examining gender inclusiveness, user engagement, and incumbent loyalty in innovation uptake.

Keywords: user engagement, incumbent loyalty, innovation adoption, innovativeness, playfulness.

Chapter 1 Introduction

1.1 Background

Smartphones, tablets, smart TV, smart watches and phablets are just a few examples of ubiquitous computing devices (UCDs) that make it easy for people to connect with people around the world. UCD usage is on the rise not just in highly developed, techsavvy nations but also in emerging and underdeveloped economies. Consumers are using gadgets more and more in both their personal and professional life, making them an integral part of their daily lives. Customers wait feverishly in lines outside businesses days before the release of new versions of already-owned electronics in highly industrialized nations due to the huge demand for such devices. Technology development has produced a vast array of commonplace devices, and by 2018 it is expected that sales of smart devices would exceed \$19 billion (Jeong, Kim, Park, & Choi, 2017) which is expected to be doubled by 2022 becoming \$27 billion (Forbes, 2018). According to the Global Web Index Report, about 90% of people in industrialized nations own smartphones, 84% own laptops, 40% own tablets, 5% own smart watches, and 10% own wearable smart devices (Mander & Katie, 2017). As people use several devices to stay connected wherever they are, ubiquitous technologies are progressively taking over both the online and offline worlds of businesses.

Comparing Asian nations like India, China, and Indonesia to Europe and the United States reveals the enormous evolution of commonplace devices, which is a sign of a country's technological and innovative leadership

As a growing economy, Pakistan has seen tremendous development in the number of mobile phone customers, who were just 14% of the population in 2005 but now account for 80% of all inhabitants as of 2017 (Sangi, Liu, & Samad, 2017) to 86.70% of the

population in 2022. According to data from 2017 (PTA), there were 40% more smartphone users than there were in 2013 (out of 139 million total mobile phone customers), indicating that the number of smartphone users is anticipated to grow by 7 to 10% annually (BusinessPlus, 2016). Now, Pakistan has more than 181 million mobile subscribers (Geo, 2022) Along with this, Pakistani customers are widely adopting the trend of ubiquitous gadgets, as shown by the fact that 76.6% of online traffic is generated by smartphones, 22.53% by laptops, and 0.87% by tablets (Globalstats, 2022). Technology use has increased in Pakistan despite the country's economic and financial problems because of the youth's voracious hunger for online gaming, constant connectivity, and online content availability. Table 1.1 lists the functions of linked devices and how they are used. Since the advent of broadband, 3G, and 4G connections, the average Pakistani consumer has changed, and the market potential is also obvious from the increase in the contribution of telecommunications to the exchequer from 115 billion PKR in 2018 to 290 billion PKR in 2020 to 228.4 billion PKR in 2021. (PTA, 2022).

Table 1.1 Demographics and Usage Pattern of Smartphones in Pakistan	
60%	Owns more than one smartphone
90%	Use for Social Networking
72%	Games
64%	Videos
55%	Music
55%	Entertainment Purposes

There are many opportunities for multinational businesses to enter and establish their brands in Pakistan as it is a significant potential market for devices that are widely used.

Recent data shows that the shipping of smartphones increased significantly by 27.6% in 2017, reducing the segment of feature phones by -4% during the same period as more than 2 million consumers were shopping for new smartphones each month. With the transition from feature phones to technologically advanced handsets, consumers in Pakistan are beginning to behave in a manner that is analogous to that of customers in affluent nations. This growth may be exponential if the environment is made more safe, more sophisticated infrastructure is built, greater data coverage is achieved, and beneficial data-enabled services are provided. This need for connected devices may be fed by this growth. (IDC, 2017). As a result of the arrival of numerous China-based smartphone companies offering less expensive smartphones with high-quality features, quickening competition for high-priced brands, an online shopping site predicted Pakistan will become one of the most technologically advanced nations in the future years. In 2024, smart phone volume growth is expected to increase by 2.2% indicating revenue in the smartphones segment amount to \$3.72 billion in 2023(Statista, 2022) .

Table 1.2 Key Events in the History of the Pakistani Mobile Market

(Jan & Henry, 2016)

Launch of Mobile Phone Services	1990
10 million Connection	2005
50 million Connections	2007
100 millions Connections	2010
13% Smartphone were Penetrated	2013
3G/ 4G services were introduced	2014
15% Smartphone were Penetrated	2015
40% Smartphone Penetration (PTA, 2017)	2017
86.70% Smartphone Penetration (PTA, 2022)	

Undoubtedly, today's shoppers are following the newest trends, which are UCDs. Consumers tend to view technological resources as a dominant resource for fulfilling their desired demands and tasks, whether in their personal or professional lives. The way we socialise, take care of ourselves at home, work, and play has all been transformed by technology. (Boczkowski & Mitchelstein, 2021). In addition, gender is an important factor in user engagement and playfulness because it affects a user's level of comfort and familiarity with the product. For example, a female user may be more open to playful features and design elements due to her traditionally nurtured role in society, while a male user may be more likely to respond to logical, practical features. Additionally, gender can also impact the way a user perceives the product and how it may be used. Therefore, it is important to consider gender when designing and marketing technologies to ensure users feel comfortable and engaged with the product. By allowing information to be accessible everywhere and creating radical new opportunities for digital enterprises, the emerging techno-ecosystem is erasing the distinctions between the physical, social, and temporal realms. As a result of the hedonic and practical benefits of UCDs, users of all ages are being encouraged to engage in obsessive activities and are choosing to purchase devices that provide exhilaration, peace of mind, and wish fulfilment. However, in order to succeed over the long term in this lucrative industry, connected devices need to be intelligent and capable, and user insights and feedback are a pre-requisite for this sustainability. Furthermore, market research indicates that the acceptance of connected devices will increase to 1.5 devices per individual as these UCDs develop with astounding breakthroughs, giving rise to associated and complicated ubiquitous media platforms that enable customers to

network and complete a wide range of jobs in the professional and personal spheres, and also are expected to create substantial opportunities for companies soon. (Jeong et al., 2017).

Because adopting incremental (Rogers, 2010) Consumers may be open to incremental or radical innovation, or they may just prefer to stick with what they know, researchers have studied how consumers embrace innovation in relation to device characteristics (Davis, 1993), consumer perceptions (Hussain & Rashidi, 2015), psychology (Hussain (W.-k. Lee & Park, 2016). A person's personality attributes, like creativity, which Rogers (2010) stresses, and psychological effects, such customer involvement, which according to a variety of literature, as O'Brien and Toms (2008) assert, are actually what matter truly to this case. Further, Consumer innovativeness is the propensity for novelty and zeal for invention in a person (Hirschman, 1980; Midgley & Dowling, 1978; Rogers, 2010). In contrast, customer engagement is a sequence of temporal engagements of a product of high tech, company, or business that fosters loyalty and confidence (Wiebe et. Al, 2014; Hollebeek, 2011). Therefore, the process of developing and improving customer connections is what we refer to as engagement, and this, in turn, leads to an increase in consumer enjoyment, purchase intent, and product assessment (Brodie et. Al, 2013; Chung, 2015). High-tech brands make consumers mentally and emotionally attached and believe that the cost-benefit balance has been achieved (Phang, Zhang, & Sutanto, 2013). A pleased and loyal consumer desires to learn more about new goods, services, and perks because they feel a feeling of belonging (Braxton & Lau-Gesk, 2020). The amount of psychological, behavioural, and emotional connection with the manufactured good created with satisfaction of brand, trust, value and brand promise determines whether current or new technology is used (Atulkar, 2020). User engagement is an understanding that emerges by employing a high-tech gadget that impacts behaviour due to utilitarian interface, hedonic flow and

perceived technology-task fit (Wang et. Al, 2021). In addition to this, it provides a model for studies that investigate the interactions and outcomes of humans and computers working together.

This study draws on the research on user engagement and innovation adoption to investigate the dispositional and moderating variables that contribute to a consumer's inclination to embrace radical or incremental innovation, or to remain loyal to an existing gadget. An innovation's hedonic benefits increase when current users engage with the brand, changing the situational characteristic of delight over time. This, in due course, leads to a feeling of belonging with contemporary Ubiquitous computing devices, either leading a consumer to embrace analogous devices with revolutionary or incremental developments or generating substantial brand loyalty for existing devices, which opposes radical and incremental advancement (Woong-Kyu, 2016; W.-k. Lee & Park, 2016). Furthermore, as evidenced by the research, not only active engagement but also natural personality traits such as consumer innovativeness encourage behaviours, increasing the likelihood of adopting innovation. According to Byun (2017), this study presents a behavioral model that demonstrates how consumer innovativeness and involvement affect the choice to adopt an innovation through playfulness or hedonistic rewards and self-congruity. These findings will be helpful to marketers in increasing the behaviour of customer interaction and recognising the value of such behaviour in the success of radical and incremental UCDs.

1.2 Problem Statement

UCD companies are unveiling innovative innovations after substantial R&D to increase market share, revenue, and exposure (Ritala & Sainio, 2014). Each year, new smartphones, tablets, laptops, smart watches, and smart TVs are produced with new combinations, designs, technologies, and potential, while younger and cheaper firms appear on the market, dropping low-cost and throwaway things, producing severe

rivalry (Zhang & Hou, 2017). Only 43% of existing iPhone customers are contemplating upgrading, according Apple's own study (Edwards, 2016). Therefore, it is vital to research on individual characteristics (Koschate-Fischer et Al, 2017) and the impact of psychological demands (Wozniak et al., 2017) on the recognition of progressive or radical technologies in the same product line, which are neglecting to retain consumers leads in lost revenues, disloyal customers, and reputational damage (Do et. Al, 2019). With the aim of finding a solution to the problem posed, this research will look at how factors like customer involvement, fun, and creativity affect whether or not customers choose to accept radical innovations of UCDs, or remain loyal to the status quo.

1.3 Purpose

The aim of this study uses self-congruity theory and playfulness to examine how consumer innovativeness and user engagement affect ubiquitous media device users' adoption of innovation or loyalty to incumbents.

1.4 Research Questions:

1. What effect does user engagement have on innovation adoption intention using playfulness and self-congruity theory??
2. What impact does consumer innovative personality have in innovation adoption intention?
3. What effect does user engagement have on incumbent loyalty according to playfulness and self-congruity theory?

1.5 Research Objectives:

1. To Determine how user engagement affects the playfulness of UCDs.
2. To determine how consumers' sense of self is affected when they engage in playful behaviour.

3. To determine the extent to which consumers' innovativeness influences their sense of self-concept.
4. To identify the effect of consumer's self-concept on innovation adoption intention.
5. To determine whether or if the innovativeness of consumers has an effect on their willingness to accept new technologies.
6. To investigate the relationship between user engagement and playfulness, which ultimately leads to loyalty for the incumbent UCD.
7. To assess the moderating role of gender on the framework.

1.7 Justification:

This study adds to theory by shedding light on the function of user involvement in the technology acceptance process as well as the influence of psychological factors on loyalty to the status quo device. In addition, earlier studies have examined the relationship between gender and strong online communities (Ibrahim et. Al, 2017), the usage of smartphones (Y. H. Kim, Kim, & Wachter, 2013), and virtual shopping malls (O'Brien & Toms, 2008, 2010). However, this study adds practical value by analysing user involvement with previously untested Ubiquitous Computing devices (UCDs). As a result, this research will assist marketers in developing effective marketing methods to urge current clients to embrace new advances.

1.8 Scope:

In the context of both incremental and radical innovation of preexisting consumer-based high-tech ubiquitous products, the social and psychological aspects that have a role in the acceptance of new technologies by consumers are the primary focus of this research.

Chapter 2 Literature Review

The research stream focuses on techniques for increasing the acceptance of gradual and radical technical product advances. This study focuses on an individual's behavioural,

personality, and situational perspectives, such as motivation, enjoyment, participation, and self-concept, and how they interact with innovation adoption and loyalty to incumbent devices. The study focuses on engagement behaviour and innovativeness as personality qualities, playfulness as a situational perspective, and the congruence of presented innovation with self-concept in the psyche of consumers who adopt new technologies.

2.1 Innovation Adoption

Innovations can change customer habits and attitudes. Various sectors, including technology, supply chain management, services, entrepreneurship, packaging, and environmental initiatives are experiencing a period of fast innovation (Rogers, 2010; Zhang & Hou, 2017). Continuous innovation, dynamically continuous innovation, and radical innovation are the three different kinds of innovation. Continuous innovation has minimal impact on customers' consumption habits or their personal, professional, and social conducts, but radical innovations and dynamically continuous are more likely to change and revolutionize these areas (Alsaleh et. Al, 2019)

Innovation adoption, which Rogers (2010) describes as customers' decisions to buy and use new products, is the end result of innovation diffusion and awareness (Su, et. Al, 2022). Similarly, Jamieson and Bass (1989) suggest that customer buying behaviour of innovation includes adoption intention and adoption behaviour. Several theories, like the Technology Acceptance Model (Davis, 1989), the Reasoned Action Theory, the Planned Behavior Theory (Fishbein & Ajzen, 1975), the Diffusion of Innovation (Rogers, multiple references), and the Social Cognitive Theory are frequently discussed in prolific literatures that focus on the adoption of innovations (Bandura, 1989). These studies examine the perspectives of incumbent consumers of innovation, compare incumbent users to non-users, and categorise users as innovators, early adopters, early

majority, late majority, and laggards. Consumers that embrace innovation are being studied in particular for their socio-demographic and psychographic traits. Additionally, academics assess innovation features like relative advantage, complexity, trialability, danger, or uncertainty to forecast how consumers would perceive how well an innovation will be received (Ejaz et. Al. 2020; Rogers, 2010). Innovation adoption involves many stages and powerful human and organizational factors (Ritala & Sainio, 2014). The procedure starts with product conception, creation and ends with customer adopting or rejecting them; corporations produce creative sources and bring them towards marketplace, or customers go to see the innovation and choose whether to consume it (Rogers, 2010). This approach is ineffective when end users do not accept innovation or when it is restricted to innovators exclusively (Mannan & Haleem, 2017). According to Risselada (2014), a plethora of studies on the subject of innovation adoption have been conducted, with different degrees of consideration given to social system variables, branding variables (Moons & De Pelsmacker, 2016), financial variables, marketing factors (Reinhardt & Gurtner, 2015). Jeong et. Al (2017) defines Many research on innovation dissemination have found customer behaviour to be the most important element in innovation adoption. As a conclusion, Hirschman (1980) argues that the selection and adoption of new goods varies from individual to individual and depend on a range of demographic, behavioural, socioeconomic, psychographic, , and culturally (i.e. value-system, ethnic) aspects.

2.2 Innovation Adoption with Consumer Innovativeness

The ability of an individual to accept or reject an innovation depends on both the innovation itself and the individual who may do so (Hussain & Rashidi, 2015; Hirschman, 1980). Consumer innovativeness shows a yearning towards new experiences and products, ideas, goods, and services (Roehrich, 2004). It also describes someone who is an inventor or can be said as very early adopter of innovation in their

or her community structure (Strutton et. Al, 1994). Furthermore, the concept posits that innovative consumers are concerned and educated about the manufactured goods categories and advancements (Hirschman, 1980). Consumer innovativeness has been the subject of substantial investigation as a predictor of innovation uptake, according to a large body of research (Koschate-Fischer et al., 2017; Reinhardt & Gurtner, 2015; Hussain & Rashidi, 2015)

Innovativeness stimulates a consumer to seek out new intellectually and emotionally interesting items, hence it is divided into two categories: cognitive and sensory (Hussain & Rashidi, 2015; Venkatraman & Price, 1990). Cognitive innovators have the intellectual tendency to evaluate the innovation; they favour the product's functional and logical qualities. In contrast, sensory innovators favour items that enhance their hedonistic experiences. According to studies, both types of innovativeness are favourably related to motivation to adopt innovation (Jeong et al., 2017).

Consumer innovativeness might also be elaborated as an intrinsic personality trait that has a significant impact on innovation uptake. Opinion leaders and Innovators are categorised by this trait (Hussain & Rashidi, 2015). Because they are the main people to benefit from technological advances, innovators have a strong incentive to monitor the market for newly introduced high-tech items. Innovative customers are more inclined to accept progressive or radical innovation because they mentally analyse it for self-congruence to solidify their status as opinion leader and market innovators (Bosnjak et al., 2012; Byun et al., 2017). As a conclusion, because of the evidence that is now available, the following hypothesis may be made:

H1: Innovation Intention is positively influenced by Consumer Innovativeness

2.2.a Gender Based Innovativeness

Gender innovativeness have reshaped our planet via the strength of their imagination since the beginning of time. (Skarzynski and Gibson 2008). And today, new breakthroughs and forms of artistic expression are affecting our lives at an unprecedented rate. All of the items we enjoy today are the result of years of research, experimenting, and innovation. In essence, they are all the product of the human intellect. gender and innovation is developing as a topic for scientific research. On the one hand, published research indicates that gender diversity is beneficial for innovation (stergaard et al., 2011),

Gender diversity (the balance of the two genders) is usually observed to have a positive effect on creativity in industrialised countries (Ritter-Hayashi et. al, 2019). Gender diversity, promotes creativity through a more diverse knowledge pool and enhanced decision making. Even though innovation is important for economic growth and reducing poverty in developing countries and is becoming better understood in this context (Hong et al., 2012), the literature has not yet talked about gender diversity to boost innovation in developing countries. countries (Ritter-Hayashi et. Al, 2019)

It is commonly considered that men are more interested in technology than women inside the high-tech industry (Holth, 2014). Consequently, they are the natural early adopters of innovative technological artefacts. Even when men and women have access to the same technology as a tool of self-expression, they frequently use it in vastly different ways. Videogames, for example, are nearly entirely played by boys and young men. (Benston, 1988).

While technological improvements have been encouraging, women have on average, less technology knowledge, fewer digital skills, a smaller online presence, and are less likely to own mobile or electronic devices. (West et. al, 2019). Access and economic

issues, a lack of knowledge, and sociocultural constraints are obstacles to the digital literacy of women and girls. Women are 8% less likely than men to own a cell phone (GSMA, 2020).

It's been shown that men are more likely to take risks when it comes to embracing new technologies, while women are more likely to proceed with caution. To put it simply, women are more inclined to buy technology for functional purposes, whereas males are more likely to buy technology for recreational purposes. When it comes to choosing a new piece of technology, women are more likely to consult with loved ones and friends, whereas males prefer to think things out on their own. However, men and women are equally likely to be curious about and open to trying out new forms of technology. When it comes to technology, ease of use and time savings are valued equally by people of both sexes. About making choices about new technologies, people of both sexes are just as likely to listen to the advice of their loved ones and friends. Technology use among people of both sexes is characterized by a high degree of self-congruity, with users more likely to adopt tools that are consistent with their own personal values and views. This raises the following hypothesis:

H2: Gender moderates the impact of consumer innovativeness which leads to selfcongruity and innovation adoption.

2.3 Self Congruity and Innovative Products

The behavioral and social sciences defines self-concept as a distinctive bond that a person have with himself (Bowden et al., 1980) or may be the "unitary-self" (Clark & Dirks, 2000) as compared with the theory of "many selves" in societal contexts (Markus & Nurius, 1986). The research of consumers has concentrated on four concepts which are real, ideal, social, and ideal-social self-concepts (Kumagai & Nagasawa, 2016; Su & Reynolds, 2017; Byun et al., 2017;). Starting with Real self-concept is how a person

perceives about himself; second is ideal self-concept defined as how the customer would want to view him or herself; third is social self-concept which is a person's belief of the way others see himself; and last is ideal social self-concept, which is the way an individual would like to be considered by others in society. Self-concept may be broken down into four categories: real self-concept, ideal self-concept, social self-concept, and ideal social self-concept and Real self-concept (Byun et al., 2017). As per Sirgy (1982), people mentally associate the goods with the concept of their self. Also, high selfcongruence level leads to a positive evaluation of the product and ultimately buy conduct (Javornik et Al., 2021). The knowledge and engagement to an item, idea, perception, or service [retail consumption] triggers a psychological mechanism known as self-concept. Positive biases for the product may arise as a result of the product's hedonic and utilitarian advantages being coherent with the self-concept. As a result, a scholar would suggest the established hypothesis (Byun et al., 2017)

H3: Self-concept influences consumers' decisions to adopt innovations. Congruence between innovation and self-concept will increase the likelihood that the innovative offering will be adopted.

Jeong et al. (2017) An inventive customer who regularly chooses the term innovation as a pioneer trying to maintain and preserve his social image as an influencer. As a result, consumers who display a high level of innovativeness have a favourable disposition towards products that feature emblems of both their own identity and cutting-edge innovation (Hussain et. Al, 2019) As a consequence of this, the findings of the investigation support the premise that;

H4: Congruence between creative product and self-concept is impacted by the consumer innovativeness.

On the contrary, a customer who is employing the innovation already might psychologically refuse it owing to self-congruence, perceive and comprehend the previously existing technology to be more tempting than the competing innovation. This is because the consumer is already using the innovation. A customer may regard the incumbent gadget's quality, symbolism, and advantages as superior because of the relative advantage (Lin, Huang, and Hsu, 2015; Booyzen, Marsh, & Randolph, 2017) and be more devoted to it (Booyzen et al., 2017; Rambocas & Arjoon, 2012; Janita & Miranda, 2013). As a result, a researcher might reach the conclusion that self-congruity can influence customer loyalty to the established brand owing to the competitive advantage offered by the innovative product.

H5: Loyalty to the incumbent is the cause of a person's self-concept.

H6: the impact of self-congruence on innovation adoption is hampered by a preference of a technology (incumbent).

2.4 Impact of User Engagement

User involvement refers to pleasant emotional, behavioural, intellectual, and emotional reactions, as well as a high-quality computing experience (O'Brien & Toms, 2008; 2010; 2013). In accordance with Rosenberg et al., (1960), Y. H. Kim et al. (2013) divided human contact into affection, cognition, and conation. Cognitive reactions are actually user-driven requirements for a particular piece of technology, such as its ubiquity or its ability to maintain connected when on the go. The emotions that a user has in relation to a technology-based product are referred to as affective reactions. These sensations, in essence, generate hedonic usage of the UCD. Finally, conative reactions predict users' actions, intentions, and behaviours (Qin, Osatuyi & Xu, 2021). As a brief perspective for comprehending human computer interaction, "user engagement" as a term is the

consequence of the initial user contact with the computation equipment, accompanied by deeper integration which leads to behavioral effects (Bellur & Sundar, 2017). Tom and Obrien split user involvement with computer devices into six dimensions based on aesthetics, playfulness, and flow theories: The first is aesthetics, the second is focused attention, the third is endurability, the fourth is involvement, the fifth is novelty, and the sixth is usability. Users get engrossed in the device for the reasons listed in Table 2.1 (O'Brien & Toms, 2008; 2010; 2013; Cano et al., 2017): aesthetic appeal, task-technology compatibility, peer endorsement, temporal flow, environmental disengagement, pleasure, novelty, and emotional experience.

Concept	Meaning
Aesthetic	The apparent outward look of the user interface of a mobile device
Novelty	the degree to which users are interested in the activity at hand and are intrigued by the technology and the information it provides
Involvement	the emotions of the users, their interests, and whether they are having fun throughout the engagement.
Endurability	Success impressions, probability of users to promote the service to others, and frequency of future usage
Focused Attention	The engrossment of oneself in mental activities
Perceived Usability	The cognitive and emotional response of the user to the gadget.

Online programs related to health (Comello et al., 2016), interactivity of touch screen (Cano et al., 2017), and adding online reading (O'Brien & Toms, 2010), are all examples

of fields where research on user engagement factors has been conducted. The studies show that consumer interaction has an impact on psychological needs and customer satisfaction.

Mobile technologies presently have high levels of engagement; people use them not only for personal duties, but also for professional, recreational, and entertainment objectives. Mobile devices' features, applications, functionality, and user interface promote user engagement, hence producing value, satisfaction, motivation, enjoyment, loyalty, and a desire to connect with the social community (Vayghan, Baloglu & Baloglu, 2022). According to organizational study, user engagement is strongly linked to customer retention, employee engagement, customer happiness, and enhanced sales and productivity (Cano et al., 2017). Users make a conscious decision to interact with UCDs; the level of success depends on how deeply they are drawn into the experience, which in turn affects the user's functional, hedonistic, and social outcomes and the company's long-term viability (Harter et al., 2002). Consumers value and accept ubiquitous technologies because they are readily available and provide continuous internet connectivity (Cano et al., 2017; B. Kim, 2017). Hedonic user engagement experiences—entertaining, fun, and delightful—develop an emotive bond with the gadget and bring considerable value to the customer, according to comprehensive study (Davis, Bagozzi, & Warshaw, 1992). Affective engagement motivation after first adoption determines post-adoption lifestyle consumption (Cano et al., 2017; O'Brien & Toms, 2013). This gives rise to the subsequent hypothesis that may be formed as a result:

H7: When people get more involved with the UCDs, they will be more playful.

2.5 Hedonic Stimulus

Hedonism is consumer behavior related to multimodal, creative, and emotional product experiences, according to Hirschman and Holbrook (1982). (Shahid & Paul, 2022). extra value (Abdul-Ghani et al., 2011). The hedonic advantages of a novel product or service are the good sentiments that arise about the product or service as a result of the delight that is derived from an experience. A product consumer who likes the existing innovation admires gradual or radical innovation. For example, playfulness may be defined as a desire for enjoyment and satisfaction through participation in tasks (Byun et al., 2017). The ability to be playful heightens both one's own enjoyment and connection with a product. The preference of consumers is for intrinsic gratification above external benefits (Arghashi & Arsun 2022). Playing around with a concept encourages active participation from consumers, who are also cognitively spontaneous and curiously imaginative (MacKinnon, 1962). According to Byun et al. (2017), playfulness as an innate motivation that provides delight from unique experiences and motivates people to do things for fun regardless of performance. Playful clients are more creative, open-minded, flexible, tolerant of innovation, willing to change their self-concept, and congruent with novelty (Müller-Stewens et al., 2017). Consumer playfulness enhances creativity through improving self-concept and image of the product (Marin, Reimann, & Castao, 2014; Byun et al., 2017).

H8: Playfulness enhances self-concept about creative items.

Chapter 3 Methodology

The research aims to investigate, based on post-positivism, the study seeks rationality all through with logical reasoning and it has controlled methodology with constructed

hypotheses for verifying or falsification (Saunders, Lewis, & Thornhill, 2009). The survey approach is single. Cross-sectional data collection and SEM analysis. Current users of high-tech devices such smartphones, tablets, smart TV, smart watches and also phablets who are between the ages of 18 and 34 and live in metropolitan Karachi and have at least a tertiary degree been the focus of this research and has English command, as the questionnaire is not translated. Millennials aged 18 to 34 have the most connected gadgets, according to Kemp (2017) and Hussain and Rashidi (2015). Convenience and self-selection sampling is used. The sample size is based on multivariate analysis techniques that suggest a ratio of 1:50 for regression analysis, so 5 variables require 250 respondents. However, According to the results of the SEM analysis, the data must be greater than 250, and the factor loading must be greater than 0.6 for each observed factor; nevertheless, the researcher has decided to use a sample size of 500 owing to the complexity of the model and the substantial number of observed data (Hair, Black, & Babin, 2010).

3.1 Data Collection and Analysis

Data is acquired using a structured questionnaire with each scale loaded at >0.6 . The survey has three parts: Initial section includes demographics questions, followed by screening questions of ubiquitous devices, and Adoption Intention (Al-Debei & AlLozi, 2014), Playfulness, Consumer Innovativeness, Self-Congruence (Byun et al., 2017), and Loyalty with Incumbents (Cano et al., 2017) are all measured on a likert scale (Woong-Kyu, 2016). The researcher converts questionnaire results into numerical codes and uses SmartPLS for exploratory Factor Analysis, convergent construct validity (Hair et al., 2010), descriptive, AVE, composite reliability (Hair, Gabriel, & Patel, 2014), and structure equation modelling.

Chapter 4 Analysis

4.1 Demographics and Screening

The total number of responses studied was 654, and they represented all of the students currently enrolled in different programs at private sector universities in Karachi. The sample consists of 54.6% male respondents and 45.4% female respondents. Roughly 69% of the respondents hail from either the middle or upper middle class, and their monthly family income is greater than Rs. 150,000. Average age in the sample was 23.70. All respondents have been aware of and used these omnipresent technologies for about 6 years on average.

4.2 Exploratory Factor Analysis

Principal component analysis with Varimax rotation was utilised by the researcher in order to further investigate the dimensionality of the 58 items that belonged to the six variables. Items that had similar levels of variation were brought together, while those that had low factor loadings of less than 0.6 and high cross loadings of more than 0.4 were being eliminated (Hair et al., 2010). Further adding the idea of user engagement, which originally consisted of 31 questions and six dimensions, has been simplified down to the three dimensions shown in Table 4.2. Because of the strong link between the two factors, Visual Appeal and Novelty were integrated into a single measure that the researcher referred to as Interaction Appeal.

Table 4.1 Exploratory Factor Analysis					
Playfulness		Focused Attention		Innovativeness	
q1	0.838	q18	0.758	q41	0.841
q2	0.843	q19	0.626	q42	0.652
q3	0.902	q21	0.768	Self-Congruity	
q4	0.81	q22	0.754	q45	0.673
q5	0.788	q25	0.646	q46	0.717
q6	0.875	q26	0.751	q47	0.719
q7	0.882	q27	0.724	q48	0.665
q8	0.821	q28	0.71	q49	0.702

Interaction Appeal		q29	0.748	Incumbent Loyalty	
q9	0.636			q50	0.613
q10 q11	0.728	q30	0.701	q51	0.82
q12	0.769	Perceived Usability		Innovation Adoption	
		q32	0.742	q54	0.821
q13	0.676	q33	0.839	q55	0.799
q14	0.678	q34	0.841	q56	0.783
q15	0.682	q35	0.753	q57	0.73
q16	0.657	q36	0.732	q58	0.723

4.3 Validity and Reliability

A modelling approach was applied so that the measurement could be analyzed in conjunction with the structural model. It was required to perform reliability, convergent validity, composite reliability, and discriminant validity tests ahead to model testing to evaluate whether or not the tool was suitable. This was necessary to assess the suitability of the instrument was appropriate given the fact that several items were being utilized to measure a single idea. Exploratory factor analysis demonstrated convergent validity, hence only items with loadings larger than 0.6 are included. Table 4.3 includes not only descriptive statistics but also composite reliabilities and the average variance that was derived from the data.

Table 4.3 Descriptives and Reliability Measurements for Variables					
	Mean	SD	Cronbach's Alpha	Composite Reliability	AVE
Focused Attention	3.3106	1.30826	0.909	0.926	0.61
Interaction Appeal	2.9366	1.35491	0.951	0.958	0.695
Perceived Usability	3.7648	1.36381	0.906	0.93	0.728
Playfulness	2.8445	1.39077	0.952	0.96	0.75
Innovativeness	3.6642	1.48548	0.71	0.872	0.774
Self-Congruity	3.2870	1.04330	0.824	0.876	0.587
Incumbent	3.4270	1.26343	0.664	0.854	0.746
Innovation Adoption	3.3548	1.36994	0.855	0.895	0.632

All constructs except incumbents have over 0.8 Cronbach's alpha. The average variances of Fornell's composite reliabilities are over 0.5, suggesting that they are all greater than that number. Additionally, the AVE is used to assess the discriminant validity of a model by comparing the square root of the AVE to the correlations that exist between each relevant pair of components (Fornell & Larcker, 1981). Validity of the construct discriminant is displayed in Table 4.4.

Table 4.4 Discriminant Validity Measure								
	Focused Attention	Incumbent Loyalty	Innovation Adoption	Innovativeness	Interaction Appeal	Perceived Usability	Playfulness	Self- Congruity
Focused Attention	0.781							
Incumbent Loyalty	0.199	0.864						
Innovation Adoption	0.239	0.272	0.795					
Innovativeness	-0.13	0.267	0.455	0.88				
Interaction Appeal	0.627	0.155	0.259	-0.309	0.834			
Perceived Usability	-0.172	0.193	0.072	0.51	-0.531	0.853		
Playfulness	0.6	0.151	0.273	-0.291	0.81	-0.485	0.866	
Self-Congruity	0.401	0.403	0.558	0.295	0.457	-0.033	0.435	0.766

The study's assumptions were verified using AMOS 23, for large sample size data and theory validation or confirmation research, a covariance-based SEM better suited.

According to Kline (2015), the skewness and kurtosis values for every item fell within the recommended limits for a multivariate normality in sophisticated models with almost sample sizes higher than 400. These ranges are -3 to +3 for skewness and -7 to +7 for kurtosis, respectively.

Table 4.6 Overall Model fit Summary	
Chi-square	86.670 Degrees of freedom = 14
GFI	.969
AGFI	.920
IFI, TLI and CFI	.969 .937 and .969
RMSEA	.08

According to the Structural Equation modelling fit indices, the chi-square value is 86,670, and there are 14 degrees of freedom. High modification indices for both the independent and dependent variables, within the limits recommended by Hair et al.

(2014), indicate a strong fit and support the conclusion that the model is well-fitting (see Table 4.6).

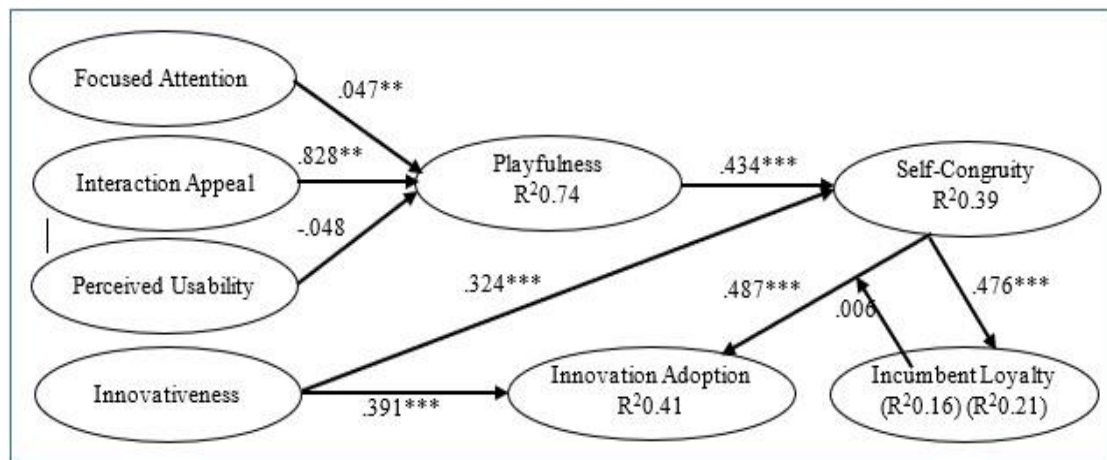


Figure 4-1 Structural Equation Modelling Path Coefficients

Table 4.7 Path Coefficients					
Hypothesis				Estimate	P
H7a Supported	Playfulness	<---	Focused Attention	.074	.002
H7b Supported	Playfulness	<---	Interaction Appeal	.828	***
H7c Not Supported	Playfulness	<---	Perceived Usability	-.048	.052
H3 Supported	self-congruity	<---	Innovativeness	.324	***
H6 Supported	self-congruity	<---	Playfulness	.434	***
H2 Supported	Innovation Adoption	<---	self-congruity	.487	***
H4 Supported	Incumbent Loyalty	<---	self-congruity	.476	***
H1 Supported	Innovation adoption	<---	Innovativeness	.391	***
Modified H7c	Incumbent Loyalty	<---	Perceived Usability	.209	***
H5 Not supported	Innovation Adoption	<---	Moderation	.006	.873

4.4 Gender Moderation Testing

The gender-based analysis was performed on the framework. The insignificant connections were removed for group analysis. Figure 4.2 indicates the frameworks with gender differences.

Table 4.2 Path Coefficients

Hypothesis				Estimate	Estimate	P
				(M)	(F)	
H7a Supported	Playfulness	<---	Focused Attention	.142	.055	0.022,0.071
H7b Supported	Playfulness	<---	Interaction Appeal	.811	.724	***,***
H3 Supported	self-congruity	<---	Innovativeness	.367	.311	***,***
H6 Supported	self-congruity	<---	Playfulness	.512	.261	***,.013
H2 Supported	Innovation Adoption	<---	self-congruity	.328	.491	***,***
H4 Supported	Incumbent Loyalty	<---	self-congruity	.411	.429	***,***
H1 Supported	Innovation adoption	<---	Innovativeness	.471	.442	***,***
Modified H7c	Incumbent Loyalty	<---	Perceived Usability	.109	.055	.036,.178

The results indicate that there are similarities among the behaviors of male and female. However, the differences exist in the relationship of focused attention towards playfulness and perceived usability towards incumbent loyalty. Both are found to be insignificant for females.

Chapter 5 Discussion and Conclusion

In addition to making theoretical and practical advances, this study demonstrates that Byun et al. (2017)'s model is accurate. The connection between dependent and independent variables is amplified by the study's goal of understanding innovation uptake in conjunction with customers' underexplored loyalty to incumbent products. Ubiquitous device user involvement suggests innovation adoption and incumbent loyalty. Theoretically, the study suggests that user engagement with ubiquitous electronics may be broken down into three components: interaction attractiveness, undivided attention,

and perceived usability. Interaction appeal is the single most important factor in determining level of engagement, and it has been measured as a desire to touch interactive gadgets (Cano et al., 2017). Second, using theory of self-congruence to examine how self-image amplifies innovation uptake (Byun et al., 2017). Loyalty with incumbent gadgets (Woong-Kyu, 2016) also contributes to self-concept and perceived usefulness of user engagement. If the customer has a difficult time using the item due to frustrations or difficulties, he could put off purchasing a new one for a while. I have high hopes that new and superior frameworks will be developed to explore additional factors that have an impact on this one. According to the study, innovativeness is the best predictor of innovation adoption (Jeong et al., 2017; Hussain & Rashidi, 2015).

The findings show that user interaction affects creativity and satisfaction, that innovativeness promotes curiosity about novel devices, and that a the consumer's selfconcept may determine whether they accept the innovation or continue to use their existing equipment.

Marketers gain additional knowledge about interaction appeal from the framework. Wonderful aesthetics, fantastic images, and unique features captivate consumers and create a positive, fun response. If the customer is innovative, the gadget becomes part of their self-image, increasing their inclination to acquire new products with incremental or radical innovation. In order for marketers to be successful in selling new technology, they need to create customer profiles based on people's inventiveness and sense of play. The new technology must satisfy tactile demands to improve psychological attributes and innovation adoption. The findings of this study provide more evidence that psychological factors such as inventiveness, fun, and self-concept all play an essential part in influencing potential purchasers to become adopters. However, if a person struggles to learn a gadget, they are more likely to remain with

their present one. Focusing on how consumers will perceive their capacity to use a product is one strategy that may help marketers educate customers about the benefits of adopting new technologies and products.

Furthermore, it is evident that Gender inclusivity is important to consider when examining the impact of self congruity, consumer engagement, playfulness, and innovativeness towards technology adoption. Different genders may have different levels of comfort and familiarity with certain types of technology, and this should be taken into account when assessing the impact of these factors. Additionally, it is important to ensure that the technology being adopted is designed with the needs and preferences of all genders in mind. This could involve engaging in research or developing prototypes with diverse groups of participants, including people from different genders, to ensure that the technology is designed with inclusivity in mind. Finally, it is important to create a safe and welcoming environment for people of different genders to engage with the technology, so that they feel comfortable participating and using the technology.

5.1 Conclusion

This study looked at the correlation between user involvement and aspects of personality and fun when interacting with pervasive computing devices. The study also examined how these variables affected participants' commitment to their current or preferred device. Consumer attitudes toward and acceptance of innovation were shown by the survey data. There are four main factors that influence whether or not a consumer will adopt a new technology or product: 1) A consumer who has experienced a cognitive and emotional learning opportunity while using the gadget is less likely to embrace novel products; 2) A consumer who is vigorously using a ubiquitous device thoughts and feelings a sense of play compared to the device's advanced features; 3)

Innovativeness is the most essential attribute in the method of invention adoption; and

4) When the consumers recognize the innovation as a potential danger, they are less likely to purchase the innovation. Moreover, By taking gender into account when considering the impact of self-congruity, consumer engagement, playfulness, and innovativeness on technology adoption, organizations can ensure that their products and services are accessible and useful to all users.

5.2 Recommendations

Technology companies should make sure that their products are accessible to people of all genders. This means having user-friendly interfaces, services, and features that are designed with inclusivity in mind. Companies should also make sure that their support staff are knowledgeable about gender-related issues and able to provide assistance to anyone who needs it.

Companies should strive to create consumer experiences that are tailored towards people of all genders. This includes ensuring that their products and services are marketed appropriately, with imagery and language that is inclusive of everyone. Additionally, companies should actively seek out feedback from consumers of different genders to help ensure that their products and services are meeting their needs.

Companies should make sure that their products and services are engaging and fun for people of all genders. This includes providing features and options that can be tailored to different gender preferences. Additionally, companies should provide an environment that encourages creative exploration, experimentation, and collaboration among users of all genders.

Companies should strive to create products and services that are innovative and relevant to people of all genders. This means going beyond the traditional ideas and expectations of what a product or service should be and creating something that is truly unique and

meets the needs of all genders. Additionally, companies should ensure that their research and development teams are diverse and comprised of people from different genders.

Companies should implement techniques to shorten customers' time spent learning how to use new devices. When it comes to enjoying and immersing oneself in a device, the touch screen's interactivity and visual experience are crucial. Therefore, it is imperative that every new technology innovation result in more engaging forms of interactivity. The market for novel products needs to be segmented based on psychological factors rather than demographic ones, because the customer who is forward-thinking and enjoys new experiences does link originality with their sense of identity.

5.3 Limitations

The limitations of our study are since it relied on a strategy that was based on self-report surveys and non-probability sampling. As a result, researchers may observe users' galvanic reaction sensors or conduct controlled experiments to see how actively they are interacting with the omnipresent device. This study lays the groundwork for future studies on the topic of framework development on incumbent loyalty, which will help marketers better comprehend and mitigate loyalists' resistance to innovation to increase the likelihood that customers will adopt new technologies.

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