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DECISION-MAKING PROCESS OF THE HYPER-CONNECTED CONSUMER: TOWARDS A CAPRICIOUS AND UBIQUITOUS DECISION-MAKING MODEL

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Abstract
Rapid advancements in mobile and wireless technology, as well as increased accessibility to the internet, have led to hyper-connectivity. As consumers increasingly become interconnected to each other, to things and objects, they become more hyper-connected. Technology, which has resulted in hyper-connectivity, has influenced how consumers interact with the world around them. This study thus aimed to determine the hyper-connected consumer's decision-making process. The EMB model of the consumer decision process served as the foundational structure of the research. The study follows from the research by the authors Kallier-Tar, Bothma & Wiid (2024) that previously identified six factors (personal insights and influences, social influence, subjective knowledge, sources/channels of information, price and financial influences, personal and family needs) that influence the hyper-connected consumer in decision-making. Simple random sampling was utilised,

and 411 complete responses were collected. Confirmatory factor analysis and structural equation modelling were used to verify the research instrument as well as to confirm the factors that influence the decision-making process of the hyper-connected consumer. The study found that the hyper-connected consumer decision-making process is an iterative circular multi-directional interaction that occurs capriciously and ubiquitously. The study proposes a ubiquitous decision-making model for the hyper-connected consumer.
Keywords: Consumer behaviour, Hyper-connectivity, Decision-making, EMB model, Technology

INTRODUCTION

Consumer behaviour and consumer decision-making are multifaceted research areas that have interested researchers for decades (Voramontri & Klieb, 2019; Lim, Kumar, Pandey, Verma & Kumar, 2022). As early as the 1700s, economists such as Nicholas Bernoulli started to examine how consumers make decisions (Marcarelli, 2022). Bernoulli developed the 'Utility theory', which views the consumer as an 'economic man' who makes rational decisions that can be predicted (Ranyard, 2018). Many consumers' decision-making models have since been developed to understand and predict consumer behaviour (Santos & Goncalves, 2021). Several seminal decision-making models, known as the 'grand models', include Reflective Thinking, The Simon Model, the Nicosia Model, the Engel, Kollat and Blackwell Model, and The Theory of Buyer Behaviour (Pantano, 2020). Owing to the comprehensiveness of the model, the Engel, Blackwell, and Miniard (EBM) model of the consumer decision process has been adopted by many scholars (Chung & Lai, 2017; Levin & Anning-Dorson, 2024). The EBM model of the consumer decision process indicates that consumers go through a continuous process when making decisions (Chen & Lin, 2016; Ghani, Halim & Rahman, 2020). The EBM model posits that throughout the decision-making process, consumers are influenced by various stimuli, such as technological advancements, which affect their decision-making process (Levin & Anning-Dorson, 2024). B.I. (Before the Internet) readers used to buy books in physical shops, hence the buyer's choice was limited to books stocked in store or orders from paper catalogues. The sources of information available back then were mainly bound to the books on shelves or recommendations. The Internet has had an impact on several points of the book lover consumption journey (Ramrattan & Szenberg, 2016), starting with the information search process. Websites are established as an additional source of information, when not the main one, which eventually affects the decision-making process. E-commerce platforms provide information that was already available in physical shops, such as author, year of publication, number of pages, genre, price, sales rankings, and a short summary of the book. The novelty of online shopping lies in the possibility to find other consumers' opinions as a result of online reviews and ratings.

With the rapid advancement of technology, there has been a rise in hyper-connectivity (Thwaites, 20221). Hyper-connectivity refers to the "continuous connection and communication between people and machines, devices and objects as well as machines to devices, objects and individuals" (Quan-Haase & Wellman, 2005). Hyper-connectivity involves the rapid increase in the connectedness of individuals, organisations, devices and objects that has resulted from the growth of three phases of technological advancements: the Internet, mobile and wireless technology and the Internet of Things (SAP Digital Report, 2015; Pandey, Singh, Sharma & Sharma, 2020). Hyper-connectivity is always on, interactive, information-rich, always recording and about communication between people, objects and things (Chung, Park & Lee, 2017). Four critical themes of hyper-connectivity identified in the literature (van den Dam, 2014; Piatrov & Kusá, 2019; Swaminathan, Steenkamp, O'Guinn & Schmidtt, 2020) that characterise the consumer's level of connectedness and hyper-connectivity The themes include internet connectivity, owned devices, the amount of time spent on a device, and the use of applications (or apps) to conduct certain consumer activities (Swaminathan et al., 2020; Hu, Zhao, Gupta & He, 2023).

Hyper-connectivity has spurred a 'creative reinvention' of how consumers behave, make decisions and interact with the world around them and has led to hyper-connected consumers

(Thwaites, 20221). Understanding the shift in consumer behaviour and decision-making is crucial for businesses aiming to cater to modern consumers (Anand, Chakravarty, Athalye, Varalaxmi & Mishra, 2023). Hyper-connectivity has resulted in consumers who are more informed and more influenced by social media, online reviews, and digital marketing when making decisions (Jaiwant, 2023). The hyper-connected consumer is more empowered and seeks 24/7 access, transparency and more significant personal interaction with businesses (Jaiwant, 2023). The digital and hyper-connected environment has seen a rise in immersive experiences on platforms such as the metaverse, hyper-personalisation and the use and reliance on AI-driven insights that foster consumer decision-making (Zhong & Hamouda, 2024; Jain, Rakesh, Kamalun, Nabi & Chaturvedi, 2018; Gallery, 2024). While providing foundational insights into consumer decision-making, traditional consumer behaviour models often overlook factors such as immersion, flow and real-time interaction and multi-facet interactions which are vital in the hyper-connected environment. As a result, there is a need to revisit the traditional decision-making models and move towards a more dynamic decision-making model that considers the complexities of the hyper-connected consumer.

A study by Kallier-Tar, Bothma & Wiid (2024) investigated the key factors influencing the decision-making of the hyper-connected consumer through quantitative, web-based surveys. Their research identified six latent intrinsic and extrinsic factors: personal insights and influences, social influences, subjective knowledge, sources/channels of information, price and financial influences, and personal and family needs. The current research paper builds on their research findings by verifying the identified factors and employing them in constructing a novel model for consumer decision-making of the hyper-connected consumer. By understanding the decision-making process of the hyper-connected consumer, this research can contribute to businesses developing effective marketing strategies and interventions to provide customers with experiences that will facilitate their decision-making.

LITERATURE REVIEW

Over the years, many scholars have attempted to explain how consumers behave and ultimately make decisions using models that explain consumer behaviour. The models provide an abstract view of the consumer's decision-making process and usually simplify the consumer's complex behaviour (Teo & Yeong, 2003; Lou, Wang, Lu, Xiao & Xiao, 2020). Several seminal consumer decision-making models have been developed over the years, highlighting the evolution of the thought processes and illustrating the varying perspectives on how consumers behave and approach decision-making. Although these seminal models do capture the various stages in different contexts of consumer decision-making, they are limited in that they focus on individual decision-making. They assume that decision-making is a rational process and often fail to capture the intricate, multi-dimensional interactions present in a hyper-connected environment, which are essential for understanding hyper-connected consumer behaviours (Zhong & Hamounda, 2024). The EBM model, however, is one of the seminal models that underscores the complexity of consumer decision-making as it factors in the influence of stimuli such as technology and how the individual processes it in a social as well as in an external context (Levin & Anning-Dorson, 2024).

The EMB Model of consumer decision process

Although developed decades ago, the EBM model is still used by many scholars in understanding consumers' behaviour (Mishra, 2018; Yousuf & Maitlo, 2019; Hsieh & Hu, 2019; Nash, 2019; Voramontri & Klieb, 2019; Pohlmann, 2020; Guo, Kim & Kim, 2020; Han, Zhang & Wang, 2020; Miyazaki, Hoshino & Bockenholt, 2021; Varghese & Agrawal, 2021; Levin & Anning-Dorson, 2024). Regarded as one of the fundamental theories of consumer behaviour, the EBM model focuses on information processing and purchase decision-making (Sihi, 2018; Mohanty, Ramesh & Kamat, 2020). The theoretical model originally developed by Engel, Kollat and Blackwell in 1968 (later renamed the Engel, Blackwell and Miniard model) was developed to structure the knowledge and research on the types of consumer decision-making behaviour and has the aim of providing a roadmap to understanding consumer decision making (Engel et al., 1990; Poppelaars, Bakker & van Engelen,

2020). The EBM model is also used as the backbone of newer consumer decision-making models such as the model developed by Karimi (2013) who applied it to an online environment, as well as the Conbe-Hepro (Consumer Behaviour towards Health Products) Model (Ting, Ismail, Ting, Bahri, Sidek, Bt Idris, Tan, Abu Seman, Sethiaram, Ghazali, Lim, Zaki & Sohot, 2019).

The EBM model consists of five stages (i.e., need recognition, search for information, evaluate alternatives, purchase decision and post-purchase behaviour) that highlight the stages that consumers go through before, during and after a purchase is made (Kotler & Armstrong, 2023; Rodgers & Nguyen, 2022).

The need recognition stage, also known as the problem recognition stage, occurs when there is a difference between the consumer's actual state of being and their desired state (how the consumer ideally wants their current state to be) (Lamb, Hair & McDaniel, 2024). In an increasingly hyper-connected world, technological devices, connectivity, and social media are increasingly triggering consumers' needs (Voramontri & Klieb, 2019). In their study, Sudha and Sheena (2017) found that consumers tend to identify a need for a brand or product through celebrities or influencers on social media platforms such as Facebook, Instagram and X (Twitter). Individuals who, for example, are scrolling through Instagram posts can trigger a need by being exposed to products in friends' Instagram posts or online brand advertisements. Chen, Lu & Wang (2017) found that social commerce platforms facilitate the need recognition of consumers. The social features of social commerce platforms and exposure to stimuli such as content and images on social commerce platforms contribute to awareness and need recognition for the consumer (Huang & Benyoucef, 2017).

During the search stage, the consumer actively seeks information on how best to solve the problem or satisfy a need (Cunningham, 2022). How consumers search for a product and product information is evolving, the more connected consumers become (Shah & Loiacono, 2016; Sun, Law, & Luk, 2020). Connectivity and digital technology have also provided consumers with many more means to search for information about a product or brand. Voice assistants, for example, which are conversational devices that assist an individual in performing tasks, are increasingly being used to search for information about products and brands (Melumad, 2023).

The consumer will, at the evaluation of the alternative stage, compare what they know about the products, assess the advantages and disadvantages, identify what they feel is important and will decide on a course of action (Vidal-Ayuso, Akhmedova & Jaca, 2023). Online review websites, blogs, vlogs, and social media platforms are being used to enhance the 'evaluation of alternatives stage' in decision-making (Liu, Liu & Zhang, 2019; Voramontri & Klieb, 2019). These online platforms provide consumers with the advantages and disadvantages of products, the different prices, and even the best retail stores from which to purchase the products. Consumers also often build relationships with bloggers and vloggers and tend to view the vlogger's or bloggers' evaluations of brands positively and reliably (Voramontri & Klieb, 2019).

During the purchase stage of the decision-making process, if the identified choice solves the problem or satisfies the consumers' needs, the consumer will make a purchase (Were, 2023). As consumers increasingly become hyper-connected, consumers become more comfortable making a purchase online through a website, a mobile device app, social media, and even a voice assistant device (Petcharat & Leelasantitham, 2021).

Integrating e-commerce, social media and mobile technology in shopping experiences has led to new dynamics in consumer interactions post-purchase (Nayyar, Sugiat, Singla, Rojhe & Sharma, 2023). Bahiroh (2024) highlights that technology facilitates immediate access to product information and reviews, which enhances customer satisfaction through informed decision-making. In a hyper-connected environment, online platforms such as review sites and social media play an essential role in post-purchase consumer behaviour. The online platforms allow consumers to express their satisfaction or dissatisfaction, review and showcase their experiences and make recommendations (Nayyar et al., 2023).

Conceptual Model

The EBM model of the consumer decision process is used as the theoretical foundation for this research. The EBM model includes extensive and comprehensive variables that allow for assessing consumer decision-making in various contexts. The study strives to provide a robust foundation for understanding the dynamics of the hyper-connected consumer's decision-making process by building on the EBM model.

In the research conducted by Kallier-Tar, Bothma and Wiid (2024), it was noted that consumption was used as a proxy for purchase as it is proof that an actual purchase occurred. It was also pointed out that post-purchase behaviour creates a feedback loop that feeds information from the consumer experience and interaction with the product/brand back into the consumer decision-making process (Fikiri, Pane. & Ahmad, 2020). The authors thus adapted the five-stage consumer decision-making process to four essential stages: need recognition, search for information, evaluate alternatives and purchase decisions, with consumption used as a proxy for decision-making.

Identification of Factors that Influence the Decision-Making of the Hyper-Connected Consumer

The research by Kallier-Tar et al. (2024) identified six latent factors that influence the decision-making process of the hyper-connected consumer. The factors identified include personal insights and influences, social influences, subjective knowledge, sources/channels of information, price and financial information and personal and family needs. After analysing the measured variables that contributed to each latent variable, Kallier-Tar et al. (2024) concluded that these latent variables represent intrinsic and extrinsic influences that impact decision-making.

Personal insights and influences refer to the embedded knowledge of the brand or product, past experiences, and the consumer's personal or internal influences, such as perception, attitude, and values towards the product/brand (Kallier-Tar et al. 2024). These influences can be referred to as intrinsic these personal insights and influences are already embedded insights that exist in the mind, memory, and psyche of the hyper-connected consumer (Shahid & Paul, 2021:2). Studies by Sharma (2021), Barari, Ross, Thaichon and Surachartkumtonkun (2021) and Yueh and Zheng (2019) highlight that experiences that customers have had with the product or brand have a significant influence on the customers purchase decision. Aschemann-Witzel (2018) and Susilowati and Sugandini (2018) indicate that personal and internal influences such as perception, values, and perceived quality of the product influence consumer purchase decisions.

Social influences refer to changes in a consumer's behaviour due to inputs through consumers' social environment (online or offline) that consumers are exposed to (Bhukya & Paul, 2023). Manthiou, Hickman and Klaus (2020) posit that social influences can inspire a consumer's beliefs, attitudes, perceptions and behaviour about a product or service.

Subjective knowledge refers to what consumers think they know or how much and what they know about a product or brand (Fatha & Ayoubi, 2023). It is regarded as an intrinsic influence on the consumer as it is knowledge that is gained over time that becomes engrained in the consumer's mind (Turnbull, Karapanogiotidis, Wang, Bernhardt, Leech, Margulies, Svhooler, Jefferies & Smallwood, 2020:2). Essiz, Yurteri, Mandrik and Senyuz (2023) found that consumers subjective knowledge was an important predictor of consumer purchase behaviour.

Sources/channels of information, which is an extrinsic influence on consumers' decision-making, refer to the various channels, online and offline, that consumers can be exposed to product and brand information (Meijer, Grunert & Lähteenmäki, 2023). In a hyper-connected environment, consumers are exposed to and fed a deluge of information daily (Klein, Zhang, Falk, Aspara & Luo, 2020). The constant exposure to product and brand information online and offline influences consumers' purchase decisions (Dwivedi & Wang, 2021; Fan, Wang & Mou, 2023).

Price and financial influences are critical factors in consumer decision-making (Monoarafa, Juliana & Setiawan, 2023). Price and financial influences are extrinsic influences that impact consumers' purchase decisions. Consumers in an increasingly hyper-connected environment can search and compare the prices of products online before making a purchase decision. Peteva (2020)

indicates that consumers' ability to make price comparisons instantly has resulted in more price-sensitive consumers.

Personal and family needs encompass the consumer's personal situation, such as the consumer's surroundings, the time they have for shopping, the consumer's lifestyle and family situation (Babin & Harris, 2023). The situational factors are extrinsic influences on the consumer's decision-making as they are stimuli that are external to the individual and are received and processed mentally. Purwanto (2020) found that personality, self-concept and lifestyle significantly influence consumers' purchase decisions. Roy & Das (2023) suggest that situational factors such as time constraints, technology, and surroundings influence the consumer's decision-making process.

Using the six latent factors identified by Kallier-Tar et al. (2024), the following (Figure 1) conceptual model of the decision-making process of the hyper-connected consumer is proposed. The research aimed to verify the latent factors and employ the factors in constructing a novel model for consumer decision-making of the hyper-connected consumer.

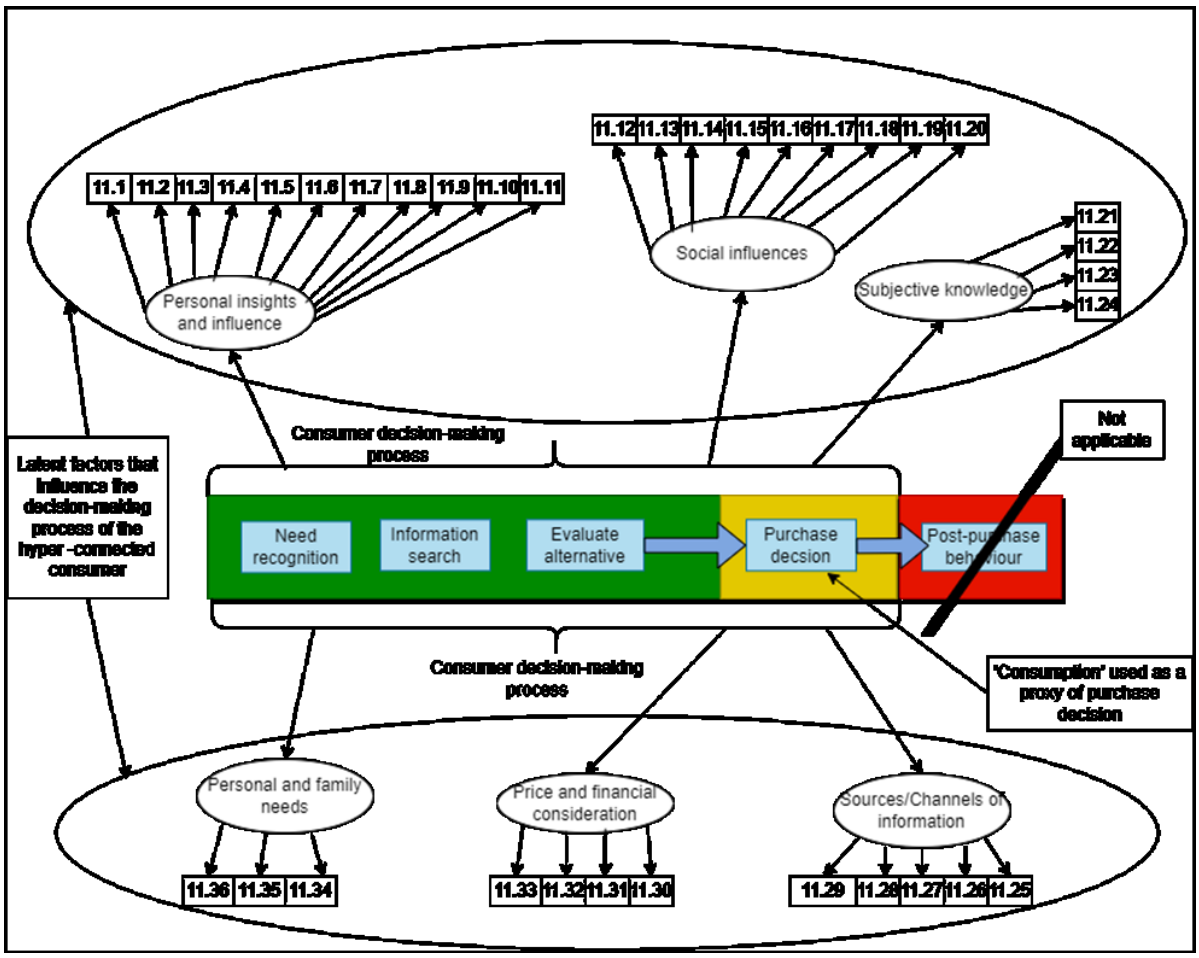


Figure 1. Proposed decision-making model for the hyper-connected consumer

METHODOLOGY

The research followed a quantitative approach and employed simple random sampling to collect the data. Respondents were provided with the research details and asked to indicate if they agreed to participate in the research before continuing. The purpose and objectives of the research, as well as terms and conditions, such as the time it will take to complete the survey, were outlined in the weblinks. Respondents were informed that participation in the research is voluntary and could withdraw at any time. It was also emphasised that the responses would be anonymous, and the results could not be linked to the individual respondent. Respondents were made aware that by selecting to agree and continuing

with the survey, the respondents accepted the terms and conditions and consented to participate in the research. Simple random sampling was used to collect the data.

The measuring instrument used was adapted from the research conducted by Kallier-Tar et al., (2024) and consisted of a series of closed-ended questions with numerical responses on a Likert scale. The questionnaire consisted of three sections; section A was used to identify the hyper-connectedness of the consumers. The questions in section A focused on the consumer's level of connectedness, device ownership, and application usage in conducting everyday activities. Section B of the questionnaire used a Likert Scale that focused on the six latent factors. The questions in section C were related to the demographic profile of the respondents.

The survey was sent out to 5,000 respondents, of which 601 attempted the survey. After the data-cleaning process, the final sample consisted of 411 useful responses. The response rate for the research was 8.22%.

DATA ANALYSIS

The demographic information highlighted in Table 1 provided insight into who the respondents for the research are. The sample consisted primarily of female consumers (66.7%), the majority (68.4%) of whom are between the ages of 18 and 35. Respondents within the sample fall within the millennial (individuals born between 1981-1996) and generation Z (individuals born between 1997–2012) generational groups (Ghouse, Shekhar & Chaudhary, 2024). The millennial and Generation Z generational age group consists of individuals who grew up during the growth of technological innovation and are said to be more accustomed to using various devices and being connected online. Respondents were also predominantly from the Gauteng province, which is said to be the economic hub of South Africa.

Table 1
Demographic characteristics of the sample

Gender	**Frequency (N)**	**Percentage (%)**
Male	136	33.1
Female	274	66.7
Other	1	0.2
Total	411	100
Age		
18–25	113	27.5
26–35	168	40.9
36–45	91	22.1
46–55	30	7.3
56–65	9	2.2
Missing	0	0.0
Total	411	100
Province		
Eastern Cape	31	7.5
Free state	20	4.9
Gauteng	170	41.4
Kwa-Zulu Natal	68	16.5
Limpopo	24	5.8
Mpumalanga	15	3.6
Northern Cape	3	0.7
North-West	11	2.7
Western Cape	69	16.8
Missing	0	0.0
Total	411	100

Employment status		
Part-time	48	11.7
Employed	222	54.0
Unemployed	98	23.8
Self-employed	43	10.5
Total	411	100
Gross monthly income		
R0 – R10 000	197	47.9
R10 001–R30 000	153	37.2
R30 001–R60 000	32	7.8
R60 001–R100 000	10	2.4
More than R100 000	7	1.7
Prefer not to answer	12	2.9
Missing	0	0.0
Total	411	100

Source: Research data

The hyper-connectivity of the sample

As the context of the research is hyper-connectivity, it was important to determine the respondents' level of connectedness. The level of connectedness was determined by assessing the respondent's internet connectivity, the devices owned, the amount of time spent on a device, and their use of applications to conduct daily activities. The response of each respondent was analysed to determine whether they possessed the main criteria (internet connectivity, owned device, the amount of time spent on a device, and the use of applications (or apps) to conduct certain activities by consumers) to identify if consumers in the sample were hyper-connected.

The results indicate that almost 70.0% (69.1%, n=284) of respondents indicate that they are continuously (21.2%, n=87) as well as continuously and automatically (47.9%, n=197) connected to the internet. When asked which method respondents used to connect to the Internet, most respondents (86.6%, n=356) indicated using mobile cellular networks to access the Internet.

Most respondents own a smartphone (94.9%), and most respondents (80.0%) indicate that they spend more than four hours a day accessing the internet through their smartphones. Respondents also perform most of their activities on their smartphones, such as using communication apps such as WhatsApp (89.8%), using a search engine (88.1%), socialise through a social media platform Facebook (88.1%), accessing e-mail (86.9%) and do banking (82.2%). Respondents ranked communication apps such as WhatsApp and e-mail as the top apps they use daily.

The respondents were thus classified as hyper-connected, as every respondent in the sample incorporated the main characteristics of a hyper-connected consumer. The remaining results could be analysed once the sample was classified as hyper-connected.

The data analysis focuses on confirming the identified latent factors and testing the structural and construct validity of the proposed conceptual model by conducting a CFA. The data was analysed using the statistical package for the social science version 27 (SPSS 27) and AMOS Graphics 27. The results of the confirmatory factor analysis are discussed in the following section.

Confirmatory factor analysis

To test for construct validity and model validation, CFA using SEM with maximum likelihood estimation was used to examine the proposed model as a measurement instrument for the decision-making process of the hyper-connected consumer. In terms of goodness-of-fit indicators for the model, the following measures were used to determine the overall fit of the model (Hair, Babin, Black & Anderson, 2019; Denis, 2021):

1) The chi-square test statistic – significant chi-square ($p < .05$) indicates a bad fit

2) Comparative Fit Index (CFI) – value ≥ .90 indicates a good fit
3) Root mean square error of approximation (RMSEA) – value < .06 indicates a good fit. A value below .08 may also indicate an acceptable fit.
4) Standardised Root Mean Square Residual (SRMR) – value < .08 indicates a good fit

Factors within the confirmatory model were allowed to correlate, and modification indices (significantly correlated errors) were used to ensure the best fit for the model. Significant errors were allowed to correlate based on their theoretical alignment and content. The CFA of the proposed model was based on a 6-factor model.

Table 2
Proposed model confirmatory factor analysis item factor loadings

Items	**Latent factor 1**	**Latent factor 2**	**Latent factor 3**	**Latent factor 4**	**Latent factor 5**	**Latent factor 6**
Past experiences I have had with the product/brand.	.667					
The current situation that I am in. (If I have run out of a product that I need)	.606					
My knowledge of the product/brand.	.698					
My attitude or how I feel about a product/brand.	.714					
Rely on the memory of the previous experience of a product/brand.	.689					
Look at past experiences I have had with the product or brand.	.713					
Purchase certain products or brands out of habit.	.528					
Features of the product/brand.	.733					
The value I attach to the product/brand (the minimum and maximum requirements I have set for the product/brand to be worth it.)	.669					
My perception of what indicates quality.	.621					
The perceived value of the product attributes.	.619					
My social standing in society.		.631				
The people I socialise and interact with.		.595				
My mood and emotional state.		.688				
How I feel in the moment.		.671				
My personality (impulsive or not)		.687				
My personal values.		.591				
My cultural norms and beliefs.		.644				
My social class (my standing in society).		.610				
Personal influences such as the people I socialise with.		.613				
An extensive search into the			.645			

product/brand.						
My motivation (reason) for purchasing a product.			.774			
The knowledge I have about a product or brand.			.819			
The attitude I have towards a product or brand.			.774			
My values and how I live my life.				.594		
Find information on products/brands from the market (In-store)				.583		
Get information on products/brands through the marketing media such as advertisements or pamphlets.				.603		
Get information on products/brands that I need from media reports.				.602		
The product/brand country of origin				.582		
The amount of money I have available to purchase the product.					.548	
Find information by doing an online search for the product/brand.					.592	
The different prices of the products/brands.					.542	
The price of the product.					.593	
My family and their needs.						.650
My family's needs and wants.						.659
My current situation. (If I have run out of a product)						.693

Source: Research data

Modification indices suggested covariances between the errors of some factors and items. To ensure the optimal fit of the model, and in consideration of the content of the items, the covariances were incorporated into the model. The covariances, represented by double-headed rows in Figure 1, indicate that there are bidirectional relationships between factors and items that are neither predictive nor causal (Hair et al., 2019). The covariances thus indicate relationships between the latent factors that are not linear. Figure 2 illustrates the model's AMOS output and the covariances between the various latent factors and items.

Correlations between the latent factors were tested, as seen in Figure 2, to identify how strongly the identified latent factors are related to each other. Table 3 indicates that several latent factors (factors 2,3,4,5) have correlations greater than 1. This is acceptable because of the oblique rotation applied during the CFA, which suggests that too many parameters are specified in the model and insufficient observations to estimate path coefficients correctly (Prudon, 2015; Denis, 2021). Strong relationships thus appear to exist between the various dimensions underlying the model. Table 3 provides a breakdown of the correlations between the latent factors.

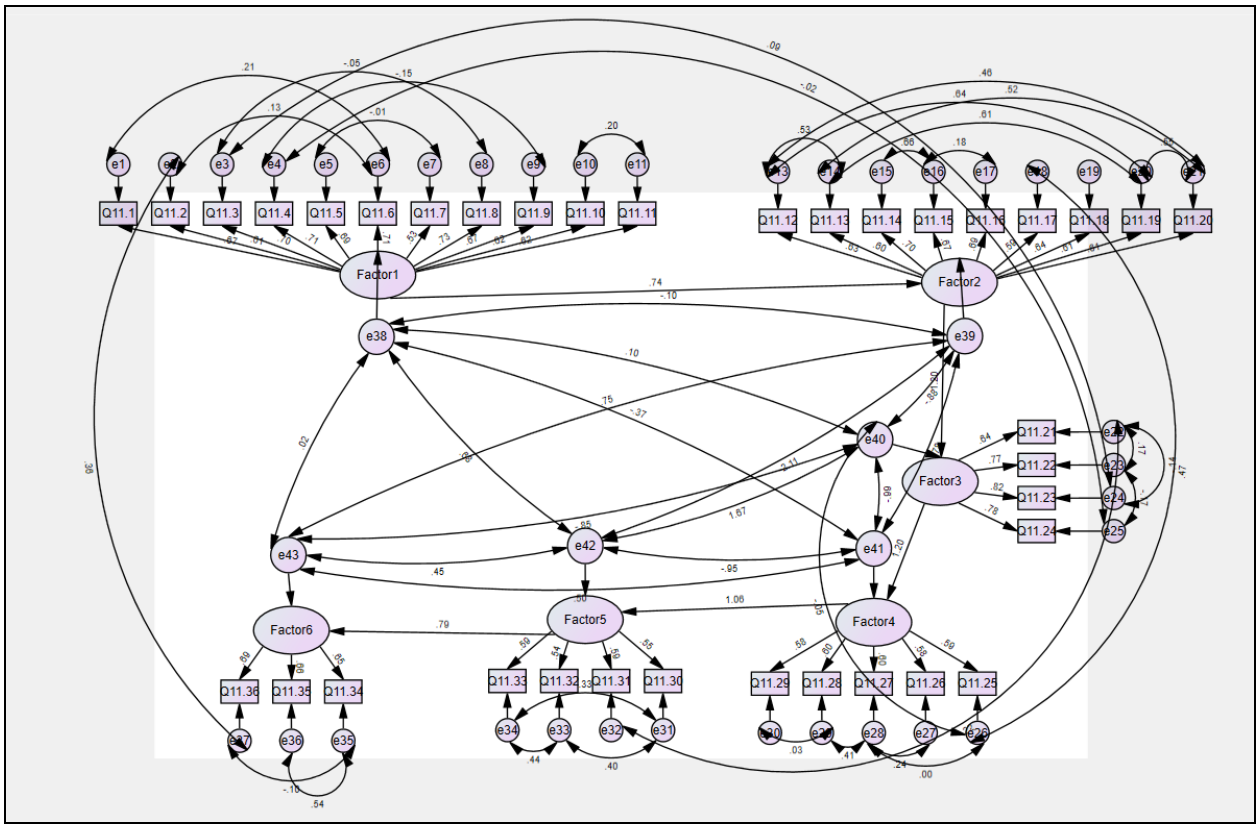


Figure 2. Model indicating the covariances
Source: Research data

Table 3
Correlations between latent factors

Latent factors		**Estimates**
Latent factor 2	Latent factor 1	.739
Latent factor 3	Latent factor 2	1.203
Latent factor 4	Latent factor 3	1.198
Latent factor 5	Latent actor 4	1.058
Latent factor 6	Latent factor 5	.793

Source: Research data

In terms of the overall fit of the model, the chi-square statistic was found to be significant with $\chi 2$ (547) = 1577.881, $p < .05$, suggesting a poor fit of the hypothesised model (see Table 4). However, the chi-square statistic is sensitive to sample size, with larger samples (such as the current sample size of 411) tending to yield a more significant result (Hair et al., 2019). Due to the unreliability of the chi-square statistic, further goodness-of-fit statistics were thus also investigated to assess the overall fit of the hypothesised model. In contrast to the chi-square statistic, the RMSEA (< .068) and the SRMR (<.0693) suggested an adequate fit of the proposed model (see Table 4). The CFI (.884) approximates to 0.9, indicating adequate fit (Guo, March, Parker, Dicke, Ludtke & Diallo, 2019).

Table 4
Proposed factor model scale goodness-of-fit indices

Model	χ^2	***Df***	***P***	**CFI**	**RMSEA**	**SRMR**
Original model	1577.881	547	<.05	.884	.068	.0693

Source: Research Data

After the factor analysis, Cronbach's alpha reliability coefficients for each factor were calculated. Table 5 provides a breakdown of the resulting Cronbach's alpha coefficients.

Table 5
Cronbach's alpha of each latent factor

Latent Factor	Cronbach's alpha
Latent factor 1	.894
Latent factor 2	.888
Latent factor 3	.833
Latent factor 4	.749
Latent factor 5	.763
Latent factor 6	.744

Source: Research Data

From Table 5, it is clear that the scales were found to have good internal consistency and reliability, with all Cronbach's alpha coefficients > 0.6. (Field, 2018; Hair et al., 2019; Abu-Badr, 2021).

FINDINGS AND DISCUSSION

The findings of the CFA confirmed an adequate fit of the latent factors that were identified as factors that influence the decision-making process of the hyper-connected consumer from the study by Kallier-Tar et al. (2024). The goodness-of-fit indices indicate an adequate model fit. A strong correlation was also found between the latent factors underlying the model. The results thus confirm the structural validity of the latent factors in the proposed conceptual model. The Cronbach alphas of each latent factor in the model show good internal consistency and reliability. However, the factor structure identified by the statistical analysis in this study failed to confirm any linear or sequential decision-making process in a hyper-connected environment. The results show that the latent factors have strong bidirectional relationships with each other, indicating an iterative circular multi-directional loop that occurs in decision-making.

The conclusions drawn by this research are supported by the findings of Rennie, Protheroe, Charron, and Breatnach (2020), who also found that consumer decision-making is no longer a linear process. Integrating technology into everyday activities has subsequently brought about fundamental changes to consumers and how consumers make purchase decisions (Grewal & Roggeveen, 2020). As a result, Grewal and Roggeveen (2020) posit that the consumer decision-making process could be a looping, non-linear process. The current research established that the hyper-connected consumer partakes in several tasks, that is, need recognition, search for information and evaluate alternatives, when making a decision. However, these tasks do not necessarily occur in a specific sequence but are an iterative, cyclical, multi-directional process. These decision-making tasks are influenced by the identified latent factors when the hyper-connected consumer makes a purchase decision.

Development of the proposed capricious and ubiquitous decision-making model of the hyper-connected consumer

In the traditional sequential consumer decision models, such as the EBM model, the consumer actively searches for information and evaluates information about a product or brand. In a digitised and hyper-connected environment, however, as technology, digital devices and internet connections become more ingrained in consumers' everyday lives, how consumers make decisions are altered. The research results do not support a sequential decision-making process but rather suggest that the decision-making of a hyper-connected consumer is an iterative circular multi-directional loop involving need recognition, information search and the evaluation of alternatives. These three tasks are not sequential steps as in the traditional decision-making model. They may occur randomly because they are influenced by the latent

factors identified and by the hyper-connected nature of the consumer. The research suggests that the decision-making model of a hyper-connected consumer is ubiquitous and capricious.

Capricious

In selecting a term to describe an 'interwoven' or 'intermeshed' decision-making process that may appear random or even haphazard at times, the term 'capricious' was selected. The Cambridge Dictionary (2024) defines this term as behaviour that changes suddenly or unexpectedly. The word capricious has previously been used in research to explain unexpected, temporal changes in consumer behaviour as well as consumers who tend to switch or alternate between brands (Yaskal, Yaskal, Volovidnyk & Lziak, 2021:62; Cachero-Martínez & Vázquez-Casielles, 2021:1; Soudi & Bouallala, 2020:42).

Ubiquitous

The proposed model is labelled as ubiquitous as it is suggested that decision-making activities can happen anytime, anywhere, and simultaneously. A consumer can be exposed to influences at any given time. The various influences can trigger the decision-making tasks of need recognition, information search and evaluate alternatives that occur simultaneously, or they can assist in decision-making that is already underway.

This implies that in a hyper-connected environment, where consumers are always on, always connected, and constantly exposed to information, decision-making is a constant and continuous process that happens at any given time and is not necessarily predictable. For example, while searching the web for a specific topic, a consumer may be presented with information or advertising about a completely different product or service. As consumers' attention is drawn away from their original purpose for being online, this new information – that may not be required then – may become subjective knowledge that influences future searches or that even begins creating a new need in the consumer's mind. The advertisement that attracted the consumer's attention may already be comparing one product with another. Alternatively, the consumer may subsequently read more about the product or follow other links to alternative products. In this way, a search for one topic has inadvertently established a need and provided a comparison of alternatives for another product, all at approximately the same time. This process is happening ubiquitously, all the time and anywhere. It could occur while at work, in the car, watching TV, or interacting with friends on social media – the decision-making model is ubiquitous, while the latent variables identified affect and mediate this decision-making process.

The proposed ubiquitous decision-making model of the hyper-connected consumer illustrated in Figure 3 can be broken down into three main circular layers. Each layer of the model will be discussed.

The first layer: Decision-making

The first layer at the centre of the model indicates the core of the model, which illustrates a 'black box'. The black box represents the human brain and the processes that occur within the human brain (Sharma, Paul, Srivastava, Yadav, Mendy, Sarker & Bansal, 2021:882). The 'black box' is what happens in the consumer's brain – it is the cognitive driver of decision-making – and is surrounded by the traditional decision-making tasks (need recognition, information search and evaluate alternatives). However, it is important to note that these tasks are argued not to be sequential but may occur one before the other and in no particular order.

Table 6 illustrates the difference in processes between the traditional sequential five-stage decision-making model and the multi-directionality of decision-making of the hyper-connected consumer.

The difference between the traditional sequential decision-making process and the proposed ubiquitous decision-making process illustrated in Table 6 clearly shows that in a hyper-connected environment, the consumer's decision-making has shifted from a rational, predictable, and sequential process to a capricious and ubiquitous process that does not follow any specific direction or even logic, and that can occur anywhere and anytime, across physical and virtual worlds.

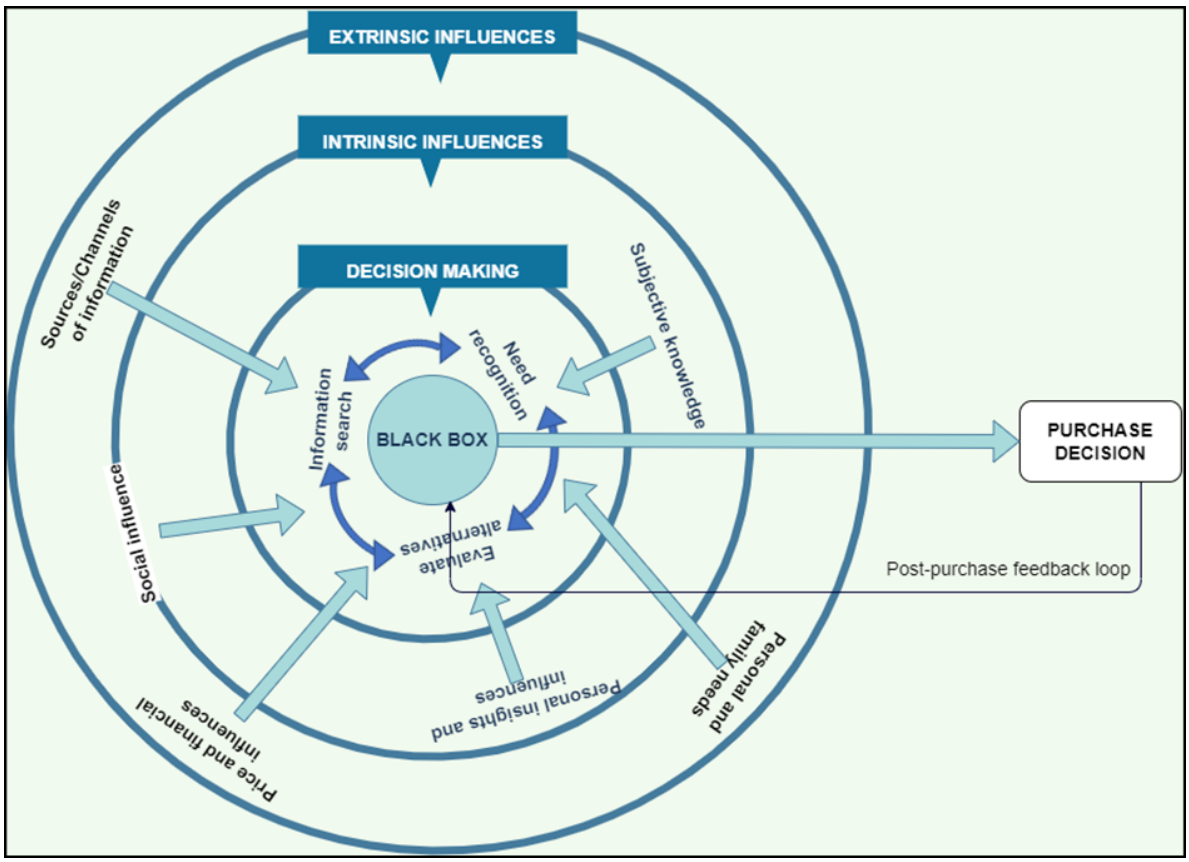


Figure 3. The capricious and ubiquitous decision-making model of the hyper-connected consumer
Source: Research data

The second layer: Intrinsic influences

The second circular layer of the proposed capricious and ubiquitous model indicates the intrinsic influences that influence the hyper-connected consumer's decision-making, encompassing the intrinsic factors identified in this study (see Figure 3). Intrinsic influences include factors personal to the consumer. The Intrinsic influences (which are identified from the latent factors) include:

- Personal insights and influences: The consumer's internal insights, such as knowledge of the brand or product, past experiences, and the consumer's personal or internal influences, such as perception, attitude, and values towards the product/brand.
- Subjective knowledge: The consumer's attitude and motivation toward the product/brand. Subjective knowledge also refers to how much or what the consumer thinks they know about the product.

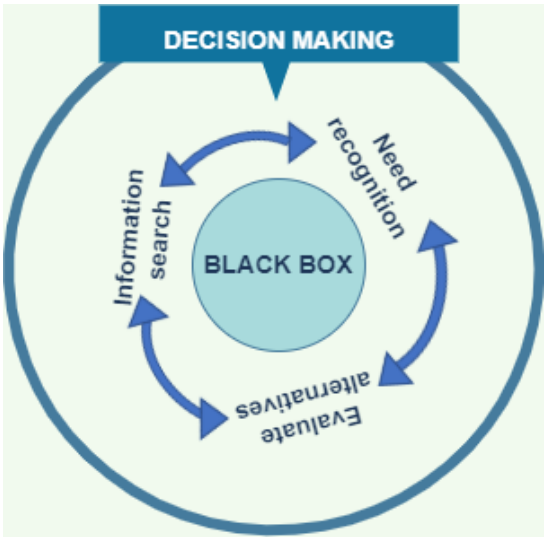
The third layer: Extrinsic influences

The model's third layer (the outermost layer) (see Figure 3) indicates the extrinsic influences that influence the decision-making of the hyper-connected consumer. The extrinsic influences are external to the consumer and include:

- Sources/channels of information: The influence of information obtained from various channels and sources on consumers' purchase decisions.
- Price and financial influence: The price of the product, finding information, and comparing the prices of a product or other brands.
- Personal and family needs: The consumer's current situation and the needs and wants of the consumer's family.

Table 6

Comparison of the traditional sequential decision-making process and proposed capricious and ubiquitous hyper-connected decision-making models.

Traditional five-stage process of decision-making process	**Decision-making in the proposed capricious and ubiquitous decision-making model of the hyper-connected consumer**
	

Source: Adapted from Engel et al. (1990)

Factors that are both intrinsic and extrinsic

Factors can also fall between the intrinsic and extrinsic layers, such as the social influence factor identified in the research.

- Social influences: The social influence factor can be placed between the intrinsic and extrinsic layers in the model illustrated in Figure 4, as the social factor consists of intrinsic and extrinsic elements. The social influences factor posits that social factors from the consumer's external environment will influence the consumer's emotions, mood, attitudes, etc., which influence how the consumer makes purchase decisions.

The proposed model illustrated in Figure 3 specifies that once the hyper-connected consumer has made a purchase decision, the hyper-connected consumer's purchase decision leads to a post-purchase feedback loop that feeds back into the decision-making process. The post-purchase feedback loop will entail the consumer's experience of the product or brand.

The proposed capricious and ubiquitous model illustrated in Figure 3 suggests that in a hyper-connected world in which consumers are continuously and automatically connected to the internet and devices and are being fed information, consumers' decision-making is a capricious and ubiquitous multi-directional interaction that is constant and continuous. Hyper-connectivity has led to decision-making that has moved from a sequential process to a continuous process that happens at any time and anywhere. The research found that consumers' decision-making is influenced by their hyper-connectivity. The hyper-connected consumer is more empowered with information; communication is bidirectional. It happens in real time, and constant access to online social environments has resulted in a more dynamic and less rigid decision-making process. The hyper-connected consumer's decision process is found to be an iterative circular multi-directional interaction in which hyper-connected consumers are continuously in the process of making a purchase decision.

CONCLUSIONS

In a hyper-connected environment in which the increased and continuous usage of digital and mobile devices, access to the internet, and connectedness to the web have disrupted how consumers behave, the boundaries of consumer behaviour and decision-making have become blurred (Khan, Raj, Marwah, Agrawal & Kalani, 2020:283). As such, there is a necessity to reassess consumer behaviour and the consumer decision-making process within the context of an increasingly hyper-connected environment. The current research represents a first-step approach to addressing and understanding the dynamic behaviour of the hyper-connected consumer.

The research aimed to fill a void in the literature by determining the decision-making process of the hyper-connected consumer. The EBM model of the consumer decision process is the most common model used in literature and industry to understand consumers' decision-making processes. An adapted version of the EBM model that consisted of four core stages (need recognition, information search, evaluate alternative, and purchase decision) was thus used to identify and extract latent factors that influence the decision-making process of the hyper-connected consumer in South Africa. The research, however, found that hyper-connected consumer decision-making is not a linear process but an iterative circular multi-directional interaction that occurs capriciously and ubiquitously. An adapted model of the ubiquitous decision-making of the hyper-connected consumer was thus proposed.

The proposed model indicates that at the core of the decision-making of the hyper-connected is a 'black box,' which represents the consumer and their thought process. The 'black box' could represent consumer perceptions formed from internal and external stimuli that the consumer is exposed to. Perception is viewed as a motivational driving force that encourages consumer engagement and guides decision-making (Stampa, Schipmann-Schwarze & Hamm, 2020). Perception is an unconscious process that occurs internally in the consumer's mind (Ngugi, O'Sullivan & Osman, 2020), and it can also be referred to as a 'black box'. In their research, Sharma, Paul, Srivastava, Yadav, Mendy, Sarker and Bansal (2021), highlight the human brain and the process that occurs within the human brain as a 'black box' which requires further investigation. It is recommended that neuromarketing research be conducted to investigate further the consumer 'black box' and consumer perception.

The research contributes to the body of knowledge by providing a new proposed model to explain the decision-making process of the hyper-connected consumer. Businesses and marketers can use the model to better understand their customers and what influences their hyper-connected customers' purchase decisions. The proposed ubiquitous model of decision-making for the hyper-connected consumer represents a shift from traditional decision-making models (such as the EBM model) that reflect a linear decision-making process. The research represents a step forward in exploring and understanding how consumers adapt and change their behaviour in an increasingly hyper-connected environment.

A principal limitation of the current research study centres on the sample included in the research. The sample consisted of consumers within the Gauteng province of South Africa only. A larger sample may provide more stable results that could be more generalisable to a larger population. Future research could, therefore, use a sample that is more representative not only of South Africa but also of other countries. Also, as far as the application of the findings in other parts of the world is concerned, this study drew on South African respondents, and the findings are therefore only applicable in the South African context.

Research ethics statement

This article is the authors' own original work, which has not been previously published elsewhere.

Author contribution statement

All the authors contributed equally to the paper.

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