

Decoding Virtual Influencers: A Systematic Review of Impulsive Consumer Buying Behaviour in the Middle East

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Abstract	Article Info
This study consists of a systematic review of recent, developing literature about virtual influencers with the purpose of examining how VIs have influenced and changed impulsive consumer buying behaviour, with particular emphasis on the Middle East, an area that has not been well-studied or explored. The revolutionising technological advancement and the increasingly intensive involvement in digital environments, have made virtual influencers, with their captivating visual effects and significantly rich content, evolve into powerful marketing agents capable of influencing consumers' attitudes and purchasing behaviour. However, existing research has mainly scrutinised customers' attitudes and engagement and neglected their immediate, affect-driven behavioural outcomes. In this study, a systematic literature review approach is adapted which uses peer-reviewed research to identify the key mechanisms through which virtual influencers are able to shape consumers' purchasing behaviour. The study is based on the Stimulus–Organism–Response (S–O–R) framework, where the characteristics embedded in virtual influencers, such as appearance, storytelling, interactivity, and cultural symbolism, work as the external stimuli that shape consumer responses through the mediating role of semiotic interpretation. Also, there are consumer trust and cultural values, the moderating factors that give influential power to these relationships. In other words, the findings highlight that impulsive consumer buying behaviour caused by exposure to virtual influencers is driven not only by analysing symbolic cues, emotional engagement, and perceived authenticity but also through cultural alignment and building trust, which are found to be critical in enhancing consumers' decision-making, particularly in high-context societies such as the Middle East. This study adds up to the existing literature by highlighting the fact that when semiotic, cultural, and credibility perspectives are combined under a unified framework, they present a more comprehensive understanding of the effectiveness of virtual influencers. It also provides practical insights for marketers who seek to design culturally relevant and psychologically effective virtual influencer strategies that can work in digitally mediated environments.	Keywords: Consumer Decision-Making, Consumer Impulsive Buying Behaviour, Consumer Trust, Cultural Dimensions, Middle East, Semiotic Interpretation, Virtual Influencers

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1. INTRODUCTION

The rapid advancement of technology and digital instruments, such as social media platforms, artificial intelligence, and immersive environments topped by the metaverse, has significantly affected and transformed modern marketing practices (Dwivedi et al., 2023; E. Kim et al., 2023). These practices are marked by shifts in online consumer habits and behaviour, especially with the prevalence of virtual influencers, with whom a considerable percentage of consumers have already been interacting and engaging (Shi, 2023). As a result, the metaverse is becoming prominent as a dynamic platform on which virtual interaction integrates with marketing and other commercial activities (Hermes & Riedl, 2021). Therefore, the evolving digital landscapes have enabled virtual influencers, who are computer-generated personas that are designed to imitate human influencers, to surpass their human equivalents to become innovative tools for brand communication, offering marketers a strong grip over identity, messaging, and visual representation (Arsenyan & Mirowska, 2021; Moustakas et al., 2020).

Alongside these developments, impulsive consumer buying behaviour has gained increasing importance in digital environments. Since online platforms have the advantages of offering immediate, continuous exposure to visually engaging content and allowing smooth marketing operations, they have become rich environments for spontaneous and unplanned consumption (Rook, 1987; Verhagen & van Dolen, 2011). Within this context, virtual influencers are created to use their carefully crafted personalities, impressive visuals and emotionally engaging stories for increasingly impulsive buying behaviour. Having such impressive features, VIs are able to weaken logic, lessen cognitive resistance to change attitudes and beliefs, enhance emotional responses, and increase consumers' readiness to engage in quick, spontaneous purchasing behaviour (Gerlich, 2023; Lou & Yuan, 2019). Moreover, the human-like attributes of these virtual personas, especially their interactive capabilities, can develop in consumers deep emotional connections and accept them as more credible. Eventually VIs can have stronger influence on consumer responses (Hewapathirana & Perera, 2024).

Going back to contemporary research on virtual influencers, the studies focused on the growing influence of virtual influencers in digital marketing, with a primary focus on how they have changed consumer attitudes, engagement, and trust. However, the existing research has not studied their effect on the consumers' impulsive buying behaviour. In addition, the research lacks studying these dynamics within culturally diverse settings, particularly in the Middle East. The key factors that are globally considered as shaping consumers' behaviour are cultural values, social norms, and symbolic interpretations. They also influence how people understand, view, and respond to marketing stimuli (De Mooij, 2019; de Mooij & Hofstede, 2011). Consumers in the Middle Eastern areas are greatly influenced by these cultural dimensions as well as gender norms and ethical considerations when they engage with virtual influencers and respond to their image and literature. Furthermore, virtual influencers take the role of cultural intermediaries, for they can successfully convey symbolic meanings and alter their identities in order to match different cultural contexts. Virtual influencers are designed to integrate appearance, content, and cultural cues; this ability makes them dominate the digital spaces as influential agents who can shape consumer perception and behaviour in the metaverse (Dwivedi et al., 2023; Polyviou & Pappas, 2023).

Nevertheless, the existing literature has not explored the extent to which these symbolic and cultural elements contribute to impulsive consumer buying behaviour. Therefore, this study takes on a structured and systematic literature review in order to develop a broad understanding of how virtual influencers influence impulsive consumer buying behaviour in the Middle East. The study integrates cultural dimensions semiotic analysis, and source credibility, and thus it identifies the key mechanisms through which virtual influencers are able to increase spontaneous consumer responses in digital environments. In doing so, it contributes to digital marketing literature since it opens a new perspective focusing on the importance of culture and behaviour in enhancing virtual influencer effectiveness.

2. LITERATURE REVIEW

2.1. Virtual Influencers' Role in Digital Marketing

Present studies about virtual influencers tackle their expanding role in shaping consumer attitudes, trust, and engagement in a digital marketing framework. When compared to human influencers, virtual influencers tend

to stand out as having consistent brand messaging, less reputational risks, and full controllability. These advantages make marketers more attracted to virtual influencers when creating strategic brand communication (Gerlich, 2023; Koles et al., 2024; Um, 2023). These digitally constructed personas enable brands to maintain uniform narratives across platforms but, at the same time, adapting content to different audience segments, thereby improving their communication effectiveness.

2.2. Virtual Influencers and Consumer Behaviour

Furthermore, virtual influencers can promote the process of establishing parasocial interactions which are essential to establish consumers' emotional attachment and build positive consumer images (Huang, 2023; Um, 2023). When virtual influencers with human-like appearance, storytelling, and interactive communication are used in combination, they can provide social proximity and familiarisation, which are necessary to exert a greater influence on consumer attitudes and behavioural responses. Source theories of anthropomorphic figures and parasocial interaction claim that consumers do attribute human-like features to virtual influencers and that, when the perceived human realism reaches a certain high level, the emotional attachment and persuasive effectiveness increase, and, consequently, the influence on consumer responses is enhanced (H. Kim & Park, 2023). In addition to anthropomorphic figures and parasocial interaction, source credibility dimensions, such as perceived trustworthiness, expertise and attractiveness, have a critical influence on consumers' responses, decision-making process and ultimately on the purchase behaviour (Lou & Yuan, 2019; Ohanian, 1990). Nevertheless, prior studies have focused largely on general consumer outcomes, such as attitudes, involvement, and purchase intentions, but have neglected more proximal behavioural outcomes (Lou & Yuan, 2019; Schouten et al., 2020). There are very few empirical investigations that examine the impact of virtual influencers in growing markets, particularly those in the Middle East (H. Kim & Park, 2024). is an important gap since consumer behaviour in such contexts is strongly influenced by cultural norms, social expectations, and socio-economic conditions, which play a key role in altering the effectiveness of the strategies virtual influencer use (Bashar et al., 2023). Therefore, there is a need for a research that focuses on a specific context that takes these cultural nuances into account when analysing consumer responses to virtual influencers. Another point that the existing literature has largely overlooked is the impulsive consumer buying behaviour being a distinct outcome, despite its growing relevance in digital commerce. Impulse buying does account for a substantial proportion of online purchases; this remark calls for the importance of examining immediate and emotionally driven consumer responses, instead of only focusing on planned behavioural intentions (Hewapathirana & Perera, 2024). This limitation implies that current studies do not emphasise the behavioural effect of virtual influencers in dynamic digital environments.

To overcome this limitation, the S–O–R framework applied in this study offers a strong theoretical support to explore how virtual influencers affect impulsive consumer behaviour. Within the S–O–R framework, characteristics of virtual influencers, namely visual attractiveness, emotional stories, interaction, and symbolic representation, can be regarded as external stimuli that influence internal organismic states, such as emotional arousal, trust, and mental engagement, which in turn influence behavioural responses in general and impulsive buying behaviour in particular (Wulansari et al., 2025). This provides an explicit understanding of how external digital stimuli lead to immediate consumer behaviours. Moreover, because VIs have an artificial and programmable feature, they can be endowed with some distinctive characteristics to make them surpass their human counterparts. For instance, if they reveal some characteristics, like consistent brand image and controlled information release, and at the same time lack personal scandals, they can decrease consumer uncertainty and improve their perceived reliability, which influence the psychology of consumers and increase the possibility of quick and impulsive purchasing behaviour (Arsenyan & Mirowska, 2021; Moustakas et al., 2020). However, the interaction between these characteristics and cultural values as well as symbolic interpretation and its influence on impulsive consumer buying behaviour has not been explored.

2.3. Impulsive Consumer Buying Behaviour in Digital Contexts

Impulsive consumer buying behaviour is generally accepted as being a hasty, quick and emotional purchase decision made by consumers without prior planning or deliberate reasoning (Rook, 1987). Unlike rational decision-making processes, impulse buying is primarily triggered by emotional arousal, situational cues, and hedonic motivations. Therefore, it is considered to be highly sensitive to external environmental stimuli. In digital environments, consumers behave impulsively when the content is always accessible and convenient;

That is when consumers are continuously exposed to persuasive marketing content, time collapses and cognitive barriers to purchase break (Verhagen & van Dolen, 2011). The growth of social media and digital commerce has further increased the tendency for impulsive buying, for it creates immersive environments that visually stimulate consumers. As a result, their emotional engagement increases and their cognitive efforts decrease (Sokolova & Kefi, 2020). Also, features such as personalised content, algorithm-driven recommendations, and smooth payment systems help consumers make rapid, impulsive decision-making. That is they act on immediate desires without much thinking. Consequently, consumer behaviour in digital contexts is increasingly and consistently shifting from a decision-making that comes after planned and deliberative processes toward a reaction that happens spontaneously.

From a theoretical perspective, impulsive buying behaviour can be very well explained through the Stimulus–Organism–Response (S–O–R) framework. That is an external environmental cue, the stimulus, influences consumers' internal emotional as well as cognitive states, the organism, leading to behavioural outcome, the response (Mc Andrew & Anderson, 1995). Within digital environments, stimuli, such as visual attraction, interaction, social presence, and marketing communication, trigger organismic responses, like becoming emotionally aroused, feeling enjoyment, and building trust, leading, in turn, to an increase in the likelihood of impulsive purchasing decisions (Akram et al., 2018; Lee et al., 2021). In the context of influencer marketing, these dynamics are made more effective once the digital personalities are given a stronger persuasive role. Influencers can be the social and psychological stimuli that influence consumers' attitudes, reduce risks, and enhance emotional engagement, and, consequently, consumers' likelihood to behave impulsively and purchase immediately increases (Lou & Yuan, 2019; Schouten et al., 2020). This effect would be even more noticeable in situations where the content is created with the purpose of entertaining, engaging, and building relational connections; the result would be frenzied and emotionally driven consumption.

Although there is a growing focus on the importance of impulsive buying behaviour in digital commerce, existing research remains largely centred on traditional online retail settings or human influencers, and there is limited attention given to the role of virtual influencers in triggering such behaviour. Virtual influencers can be given unique characteristics, including visual perfection, controlled messaging, anthropomorphic design, and algorithmically optimised interactions. Therefore, they have the potential to influence consumer psychology, especially in intensifying emotional engagement and impulsive responses (Arsenyan & Mirowska, 2021; Moustakas et al., 2020). However, the mechanisms that make these digital personas work and stimulate impulsive consumer buying behaviour remain insufficiently explored. Furthermore, there are the cultural factors that can play a critical moderating role in impulsive buying behaviour, particularly in non-Western contexts. In collectivist and high-context societies, such as those in the Middle East, there are social norms, cultural identity, and symbolic meaning systems that shape consumers' behaviour and influence how individuals regulate spontaneous consumption (De Mooij, 2019; de Mooij & Hofstede, 2011). These cultural dynamics are critical, for they either constrain or amplify impulsive responses to digital stimuli. Therefore, it is important to examine impulsive buying behaviour within culturally grounded frameworks. Overall, the S–O–R framework offers a strong and integrative theoretical background that facilitates the further understanding of how virtual influencers, as digitally mediated stimuli, affect internal states of consumers and how this, in turn, results in impulsive consumer buying behaviour. This argumentation is particularly relevant for the digital commerce environment in the Middle East, where the high rate of technological uptake coexists with strongholds of cultural values, making the decision-making process of consumers highly contextualised.

Cultural Influences in the Middle Eastern Context Cultural values play a fundamental role in shaping how consumers respond to marketing stimuli as they would influence how individuals perceive, interpret, and act toward digital content (De Mooij, 2019; de Mooij & Hofstede, 2011; Geert, 2001). Consumers from the Middle East pay special attention to social norms, collectivist orientations, gender roles, and culturally specific symbols, which shape their behaviour and, eventually, affect how they decode and evaluate marketing messages (de Mooij & Hofstede, 2011). These cultural dimensions are particularly important in online environments, where consumers' perception of visual and symbolic cues primarily lead to communication and persuasion. In spite of the increase in global acceptance and even adoption of virtual influencers, research that has examined how these cultural factors interact with virtual influencer content is still limited, particularly in non-Western contexts. Existing studies have predominantly focused on Western or East Asian markets, often overlooking the Middle East, a place where its people pay special attention to culture and therefore what they expect

regarding identity, modesty, and social conformity may significantly influence their decision-making and marketing responses (Bashar et al., 2023). This gap in the literature would lead to cultural mismatch in the digital representation resulting in consumers questioning its authenticity, and eventually the influencer marketing becomes ineffective.

Theoretically, this S–O–R model is a useful tool because it provides clear insight of how the cultural context influences consumers' behaviour while they are exposed to digital stimuli. Within this framework, digital personas employ marketing instruments, such as visual design, communication style, and symbolic representation as external stimuli. These cues are interpreted through their cultural context that control the cognitive and emotional processes that lead to behavioural outcomes (Mc Andrew & Anderson, 1995). Prior research demonstrates that digital marketing stimuli, such as the influencer's visual appeal, content, and endorsements can significantly influence the consumers' impulsive purchase intentions since these stimuli trigger in consumers emotional responses, topped by pleasure, arousal, and perceived relevance (Djafarova & Rushworth, 2017; Zhou et al., 2021). In the context of virtual influencers, these effects are more obvious as these personas are designed to integrate visual, textual, and cultural cues to create a coherent, adaptable and convincing digital identity. The anthropomorphic and interactive nature of virtual influencers fortifies their social presence and emotional engagement, and hence the outcome would be stronger, more effective consumer responses, particularly among groups that are digitally active such as Generation Z (Lina et al., 2022). However, the effectiveness of these stimuli is not equal in all contexts, but it is likely to vary across different cultural contexts. For instance, in Middle Eastern societies, values such as social harmony, modesty, and collective identity are strongly emphasised. Thus, how the content posted by virtual influencers is interpreted and analysed in the Middle East may be different from that in Western contexts, and the impact of these influencers on impulsive buying behaviour may vary.

Furthermore, cultural norms could be regarded as moderating variables in the S–O–R process because they can influence either organismic responses or behavioural outcomes. That is, symbolic meaning carriers, such as visual display, words, and behavioural signals, could either promote consumer identification and trust or have a negative impact on them if they partially fail to meet local cultural expectations. In this regard, virtual influencers could be regarded as cultural signifiers in addition to being marketing stimuli. That is, the effectiveness of virtual influencers relies on the cultural values and norms embedded in them. Nevertheless, there is still lack of systematic research exploring how some cultural factors specific to the Middle East would affect the relationship between virtual-influencer characteristics and impulsive consumer buying behaviour in particular. Notably, the interaction between cultural factors, semiotic meanings, and emotional engagement in the S–O–R process is still wanting.

Consequently, there is need to bridge this gap to achieve deeper understanding of how global digital marketing can be used to fit local cultural contexts. This study employs a structured literature review approach that synthesises existing research on virtual influencers and impulsive buying behaviour with a big emphasis on culture. By exploring how digital stimuli influence internal processes and behavioural responses of Middle Eastern consumers, this study aims to offer a more advanced nuanced and context-sensitive understanding of virtual influencer effectiveness. This study responds to recent calls for more focused and integrative research that considers cultural differences in digital consumer behaviour (Bhardwaj et al., 2024; Laszkiewicz & Kalinska-Kula, 2023; P & Kushwaha, 2023).

2.4. Trust and Source Credibility

Trust is important in influencer marketing, as trust has two benefits. It lowers the perceived uncertainty and increases consumers' readiness to follow the promotional message (Ohanian, 1990; Schouten et al., 2020). In this regard, source credibility theory claims that for an endorser to be successful, he or she must be considered trustworthy, knowledgeable, and attractive.

The presence of the following three attributes can influence consumers' attitudes and behavioural responses (Ohanian, 1990). In a digital environment, these three credibility dimensions are particularly important since consumers use heuristic cues to evaluate information and make impulse purchases. However, in the case of virtual influencers, the issue of perceived credibility is even more difficult due to the fact that they are fake and not human.

Unlike human influencers, virtual influencers cannot rely on lived experience or personal stories to build

credibility; they have to create credibility by maintaining a visual representation, controlled message, and digital persona (Arsenyan & Mirowska, 2021; Moustakas et al., 2020). Prior research emphasises the significance of perceived authenticity and transparency; findings show that these two factors are crucial in making consumers trust virtual influencers and respond positively to their messages (Lou & Yuan, 2019). Thus, trust is a critical component of consumer behaviour in the context of virtual influencers and purchase-related behaviour.

Theoretically, the S–O–R framework offers a wide-angle view that facilitates the understanding of the importance of trust in consumer behaviour. In other words, in the S–O–R framework, the stimuli from virtual influencers in terms of their visual attractiveness, interactivity, and communication style are regarded as the external stimuli that impact and influence the internal organismic states in terms of trust and emotions. Once the emotions are stirred and trust is established, the behavioural outcomes of impulsive buying would occur (Mc Andrew & Anderson, 1995). In other words, trust would be the mediating or moderating variable that connects the exposure to virtual-influencer posts and subsequent consumers' responses. Besides, anthropomorphic characteristics of virtual influencers also contribute to the perceived credibility. When virtual influencers display high degrees of human likeness, realism, and relatability, their social presence would be strengthened, and emotions would be stirred.

As a result, these digital personas succeed in gaining trust and persuasive effectiveness (H. Kim & Park, 2023). However, this relationship is not linear. Only moderate levels of anthropomorphism may enhance the digital persona's credibility, but if the representations are excessively artificial or unrealistic, they would trigger scepticism or discomfort and eventually losing trust and reducing persuasion.

Once virtual influencers are able to balance technological sophistication with perceived authenticity do they establish credibility. Some studies suggest that virtual influencers may add a sense of reliability when their designed image and content lack any personal bias or scandal risk, while other finding indicate that this constructed nature may weaken perceived authenticity, and, consequently, negatively affect their persuasive impact (Schouten et al., 2020). This tension between the two opposing studies highlights the need for more research that provides better understanding of how consumers can trust non-human endorsers. Indeed, cultural context is a key factor that helps in building trust and gaining credibility. In particularly culturally sensitive regions, such as the Middle East, social norms, values, and symbolic meanings have a significant impact on consumer behaviour. In the Middle East, the trust required for the marketing mechanism may depend not only on perceived expertise or attractiveness but also on social values and ethical representation (De Mooij, 2019; de Mooij & Hofstede, 2011). Therefore, the extent to which virtual influencers are able to generate trust and subsequently influence impulsive consumer buying behaviour may differ according to the applicable cultural settings. Although studies have indicated the importance of trust and credibility in influencer marketing, few studies have examined how these two factors operate in the context of virtual influencers and how they are related to impulsive consumer buying behaviour. Besides, the relationship among trust, anthropomorphism, and cultural values under the S–O–R framework is still vacant. Hence, it is essential to address this gap in order to comprehend how virtual influencers can effectively gain consumers' trust and stimulate their impulsive responses in any digital medium and in different and diverse cultural environments.

2.5. Semiotic Interpretation and Consumer Response

Semiotic theory provides a critical framework that explains how consumers interpret and assign meaning to visual and symbolic cues for better marketing communication (Jadou & Ghabra, 2021). In digital environments, meaning is constructed when an interaction takes place between the signifier (e.g., visual appearance, language, symbols) and the signified (e.g., cultural values, identity, and social norms), which together shape consumer perception and direct their behavioural responses. Virtual influencers, which are designed to be visually driven and symbolically rich entities, operate in order to communicate brand messages and identities through carefully constructed visual and textual elements. When virtual influencers are implemented to enhance marketing, semiotic interpretation plays a central role in shaping the consumers' emotional engagement and their behaviour. Elements, such as physical appearance, clothing, language, and storytelling style, function as symbolic cues that influence how consumers view and evaluate authenticity, relatability, and credibility (Arsenyan & Mirowska, 2021; Moustakas et al., 2020). These elements contribute to the formation of emotional responses, including trust identification, and emotional engagement, both of which lead to the

desired behavioural outcomes in digital consumption contexts.

From a theoretical perspective, semiotic interpretation can also be integrated within the Stimulus–Organism–Response (S–O–R) framework in this system, the characteristics of virtual influencers act as the external stimuli that are decoded through the consumers' internal cognitive and emotional processes, ultimately influencing their behavioural responses, such as the unplanned, impulsive buying (Mc Andrew & Anderson, 1995). In this process, semiotic interpretation functions as a critical organismic mechanism; it translates visual and symbolic stimuli into meaningful experiences that can shape the consumer responses and decision-making. For instance, beautiful appealing imagery, culturally relevant symbols, and narratives that emotionally engage audience can arouse their pleasure and, thereby, increasing the probability of impulsive purchasing behaviour. The role of semiotics is particularly significant in places which are culturally sensitive like the Middle East. There, personal interactions and communications are often characterised by high level of cultural norms and symbolic meaning systems (De Mooij, 2019; de Mooij & Hofstede, 2011). In these situations, weak signs like wearing mildly modest clothes, speaking in a culturally appropriate way and telling stories that do not offend local culture have high interpretive richness and will consequently be able to significantly shape consumer perception and buying behaviour. In this case, the full potential of the ultimate goal of building emotional engagement and behavioural responsiveness will be realised if the virtual influencer is perceived as genuine and trustworthy. Otherwise, if there is no congruence between the virtual influencer and the region's cultural expectations, the virtual influencer will be negatively perceived and evaluated, and trust will be low.

In addition, due to their flexibility, virtual influencers can cleverly control their semiotic components in order to reach the desired audience. The virtual influencer's appearance, style of storytelling, and symbolic image can all be tailored, and this merit enables the VI to adapt to different cultural environments and consumer segments. This adaptation facilitates the production of culturally sensitive content that makes VIs suitable and acceptable. These factors are crucial in prompting certain consumer responses in digital environments. Despite the significant influence of semiotic processes in marketing communication, few findings have systematically been conducted to investigate how the semiotic interpretation process affects impulsive consumer buying behaviour in response to virtual influencers. There is not enough research focusing on the interaction between symbolic meaning, cultural sensitivity, and emotional response, especially in the Middle East. Hence, addressing this gap in research is crucial to understanding how virtual influencers, when endowed with symbolic and cultural attributes, can influence consumer perception and behaviour in digitally mediated environment.

Generally, incorporating semiotic theory in the S–O–R framework offers an integrated view for analysing how virtual-influencer content is interpreted. Subsequently, these interpretations can lead to impulsive consumer buying behaviour. This study is beneficial for exploring the intricate relationship between global digital environments and local cultural meaning with respect to consumer response.

3. RESEARCH GAPS

Although there are numerous pieces of research focusing on virtual influencers and digital marketing, there are still several significant gaps that hinder a holistic understanding of VIs' influence on consumer behaviour. First, current relevant studies have predominantly focused on general consumer outcomes, such as their attitudes, engagement, and purchase intentions. The findings have given very limited attention to impulsive consumer buying behaviour as a distinct and immediate behavioural outcome. Considering the increasing widespread of spontaneous purchasing in digital environments, the limitation in current research is significant. That is, existing studies overlook a key element in consumer behaviour and response that is highly relevant to contemporary marketing practice (Rook, 1987; Verhagen & van Dolen, 2011). Second, there is a notable lack of research that examines the role virtual influencers have and their influence within culturally diverse and non-Western contexts, particularly in the Middle East. The Middle Eastern region is characterised by high social media penetration and rapid digital adoption, yet little attention is given to carry empirical investigations in this region, in contrary to most prior studies that have concentrated on Western or East Asian markets. This situation is critical since consumer behaviour in the Middle East is driven by specific cultural values, social norms, and symbolic meaning systems which may greatly affect how the received content through virtual influencers is used and enacted (Lou & Yuan, 2019). Third, most of the previous studies tend to investigate each key construct, such as trust, cultural values, and visual communication, in isolation, ignoring the

possibility that these dimensions can be combined into a single theoretical model. In particular, the interaction between semiotic interpretation, source credibility and cultural congruence have been largely neglected, although these three dimensions need to be integrated in order to understand how consumer perception and behaviour are affected. This limitation caused by failure to integrate the above-mentioned elements, hampers our understanding of how virtual influencers are able to influence consumers' responses in digital marketing context.

Moreover, it remains unclear how visual and emotional stimuli can be integrated into the S–O–R framework to induce impulsive consumer buying behaviour. Prior studies recognise the potential of affective and cognitive stimuli, but the process through which the characteristics that virtual influencers possess, such as appearance, storytelling, and interactivity, influence immediate buying behaviour remains vague. Therefore, this shortcoming indicates the necessity of adopting a process model to explore how the relationship between external stimuli and immediate behavioural responses work in digital marketing.

The last limitation is that prior research is deficient in exploring the role of semiotic processes as a mediating process in virtual influencer marketing. That is, virtual influencers mostly communicate through symbolic and visual cues; therefore, it is important to understand how consumers analyse these cues and assign meaning to them in explaining their impact on impulsive behaviour. Additionally, there is need to further investigate the role of consumer trust and cultural context as moderators, particularly in culturally aware areas such as the Middle East. Therefore, it is of utmost importance to address these gaps to get advanced theoretical and empirical understanding of virtual influencer effectiveness. Accordingly, this study responds to the given limitations in previous research by adopting a structured literature review approach that integrates cultural, semiotic, and psychological perspectives within the Stimulus–Organism–Response (S–O–R) framework. In doing so, this study aims to provide a more comprehensive understanding and context-sensitive outcome of how virtual influencers influence impulsive consumer buying behaviour in the Middle Eastern digital landscape.

4. PROPOSED CONCEPTUAL FRAMEWORK

Building upon the reviewed literature, this study proposes a conceptual framework that explains how the characteristics that virtual influencers adopt would influence impulsive consumer buying behaviour by scrutinising underlying psychological and cultural mechanisms. Grounded in the Stimulus–Organism–Response (S–O–R) framework (Mc Andrew & Anderson, 1995), the model conceptualises virtual influencers as external stimuli that are able to shape internal consumer responses and accordingly, resulting in behavioural outcomes. Within this framework, the characteristics attributed to virtual influencers, including appearance, emotional storytelling, interactivity, and cultural symbolism would function as primary stimuli that affect how consumers perceive the digital content and interact with it. These characteristics are particularly prominent in virtual environments, where visual and symbolic communication plays a central role in managing how consumers respond to such experiences (Mirowska & Arsenyan, 2023; Moustakas et al., 2020). That is to say, through their curated identities and controlled messaging, virtual influencers can create strong, persuasive stimuli that would trigger immediate and emotionally driven consumer responses.

In addition, the framework posits that the degree and kind of influence of these stimuli on behaviour is mediated by semiotic interpretation, which, according to the S–O–R pattern, represents the organismic process through which consumers would decode the virtual-influencer content and assign its meaning. Drawing on the semiotic theory (Jadou & Ghabra, 2021), consumers interpret visual and symbolic cues according to Barthes 1977, such as appearance, language, and cultural references, using the processes of signification, mainly the signifier and the signified. The meanings inferred would hold both denotative (literal) and connotative (emotional and cultural) readings. These interpretations shape the consumers' internal states, including their emotional engagement, identification, perceived authenticity, and decide the type of influence on behavioural outcomes, particularly on impulsive consumer buying behaviour. Furthermore, the framework incorporates consumer trust and cultural values as moderating variables that augment the strength and direction of these relationships. Trust, grounded in source credibility theory (Ohanian, 1990), reflects consumers' perceptions and evaluation of the degree of trustworthiness, expertise, and authenticity the virtual influencer has.

Consequently, if the levels of trust are high, perceived risk is reduced and cognitive resistance is expected to minimise, thereby the relationship between semiotic interpretation and impulsive buying behaviour become

more solid (Lou & Yuan, 2019). Conversely, if the levels of trust are low, this relationship weakens, as more focus would be given to the artificial nature of virtual influencers.

Furthermore, there are the cultural values, particularly those derived from Hofstede's cultural dimensions (Geert, 2001) that further shape how virtual influencer stimuli are interpreted and acted upon. For instance, in the Middle Eastern context, communication is often loaded with religious beliefs, social norms, and cultural cues. Thereby, symbolic alignment with local values, such as modesty, social harmony, and collective identity, plays a critical role in determining the effectiveness of the content embedded in virtual influencers (de Mooij & Hofstede, 2011). Cultural congruence is then hypothesised to positively influence semiotic interpretation and emotional resonance, which would further lead to impulsive consumer buying behaviour. On the other hand, cultural misalignment provides negative impact, which may further weaken consumers' engagement and trust. Taken together, the integrated framework suggests that impulsive consumer buying behaviour is not an immediate consequence of exposure to virtual influencers per se but instead is the result of a joint interaction among external stimuli (characteristics of virtual influencers), internal interpretive process (semiotic interpretation), and contextual moderators (trust and cultural values). By combining these three dimensions into an integrated theoretical model, the present study offers an explanatory framework of how virtual influencers have a significant influence on consumer behaviour in digitally mediated contexts that include diverse cultural contexts.

5. METHODOLOGY

This study employs a structured systematic literature review approach aiming to offer a comprehensive and theory-driven synthesis review of the existing body of research done on virtual influencers and impulsive consumer buying behaviour in Middle Eastern context. This approach is fitting as the current literature is quite fragmented and it lacks integration of cultural, psychological, and symbolic perspective, which is essential to comprehend different consumers' responses towards virtual influencers (Hewapathirana & Perera, 2024).

This study systematically identifies, evaluates, and synthesises prior studies to gain an integrative understanding of the applied mechanisms through which virtual influencers influence impulsive consumption behaviour in digital consumer contexts. The process of the review is guided by the principles of systematic evidence synthesis to ensure the rigour, transparency, and replicability of the process (Snyder, 2019; Xiao & Watson, 2019). Relevant studies have, nevertheless, been identified by carrying out searches of major academic databases, e.g. Google Scholar, Scopus, and Web of Science.

The search strategy uses a combination of keywords representing the key study constructs, such as "virtual influencers", "impulse buying", "consumer behaviour", "digital marketing" and "social media influencers". Also, articles are identified through backward and forward citation chasing to ensure comprehensive coverage of the topic.

This study is relevant and rigorous as this is subjected to pre-defined inclusion and exclusion criteria. The included studies have been peer-reviewed journal articles that were published in the English language between 2019 and 2026. The topics of the chosen articles focus on digital marketing, influencer marketing, consumer behaviour, and related domains. Moreover, the selected articles have addressed key themes that would benefit the research objectives, such as virtual influencer characteristics, impulsive buying behaviour, cultural influences, trust, and symbolic communication. On the other hand, non-academic sources, duplicate records, and studies unrelated to marketing or consumer behaviour have been excluded. After that, the selected studies have been analysed using a thematic synthesis approach. This method would allow the identification of recurring patterns, theoretical perspectives, and key variables across the literature (Bhardwaj et al., 2024; Wulansari et al., 2025). This study adopts the Stimulus–Organism–Response (S–O–R) framework and the findings have been categorised into three core dimensions: (1) external stimuli, as represented by the characteristics attributed to virtual influencers, such as appearance, emotional storytelling, interactions, and cultural symbols; (2) internal organism processes, which include emotional engagement, trust, and semiotic interpretation; and (3) behavioural responses, specifically the consumer's impulsive buying behaviour. This analytical framework would help to analyse how these factors would collectively affect consumers' responses in digital contexts.

In addition, the review also focuses on the cultural context of the Middle East because this region has its own specific social norms, gender roles and expectations, and symbolic meanings (De Mooij, 2019; de Mooij &

Hofstede, 2011), which would greatly influence consumer behaviour. Therefore, this review will explore the related core issues, including cultural dimensions, semiotic theory, and source credibility, and then combine the results for the multidimensional explanation of the effectiveness of virtual influencers.

In total, this well-structured systematic review lays a strong foundation to identify the relevant research gaps, synthesise theoretical findings, and construct an integrated conceptual framework to explain consumers' impulsive buying behaviour towards virtual influencers in culturally diverse digitalised environment.

5.1. Review Design

The systematic literature review (SLR) approach is used in this study in order to formulate comprehensive and theory-driven synthesis of the existing related literature on virtual influencers, impulsive consumer buying behaviour, and the influence of cultural factors within the Middle Eastern context, especially since research on virtual influencers remains fragmented across digital marketing, consumer behaviour, communication, and information systems. A structured review guidelines would help in clearly identifying evidence, evaluating it, and then synthesising all the collected data while avoiding selection bias and improving replicability (Snyder, 2019; Xiao & Watson, 2019).

The review process was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. The procedure involved five stages: (1) defining the review objective and scope; (2) conducting systematic database searches; (3) screening the retrieved records according to predefined eligibility criteria; (4) assessing the methodological quality and relevance of the eligible studies; and (5) extracting and thematically synthesising the evidence to support the proposed conceptual framework.

5.2. Literature Search Process

There was a systematic strategy employed to find the relevant studies made on the topic of virtual influencers and their effect on impulsive buying behaviour across different cultures. The search used different databases in order to cover a wider range of research done in various fields of interest. The keywords used in the search centred around the main constructs of the review. The search also covered publications between 2019 and 2026.

5.2.1. Database Selection

The literature search employed covered different databases. Scopus and Web of Science Core Collection were essential since they cover a wide range of peer-reviewed research in business and marketing as well as in communication, and information systems. As to ScienceDirect database, it helped in capturing relevant consumer-behaviour and technology studies. Last but not least, Google Scholar was important to track citation and identify potentially relevant studies which other databases failed to find, not to forget that backward and forward citation searching had also improved coverage.

5.2.2. Search Strategy

While carrying out the research, the strategy used was centred around the principal constructs of the review. Boolean operators, phrase searching, and truncation were applied and supported by the database. Also, representative search combinations were used, such as: "virtual influencer*" AND "impulse buying"; "virtual influencer*" AND "consumer behaviour"; ("AI influencer*" OR "computer-generated influencer*") AND marketing; "virtual influencer*" AND trust; "virtual influencer*" AND culture*; "virtual influencer*" AND semiotic*; and metaverse AND "consumer behaviour". Moreover, searches were restricted to titles, abstracts, and keywords once the database used permitted such functionality. Finally, the search period covered studies published from 2019 to 2026.

5.3. Study Selection

After gathering material comes the evaluation stage. To do so, certain criteria were used to decide which studies were eligible for this research and thus could be included and which studies should be excluded. Then, a screening procedure was employed in order to assess the relevance of the records obtained.

5.3.1. Inclusion and Exclusion Criteria

The studies that were considered eligible to use and were included in the search have the following criteria: (a) were published as peer-reviewed journal articles; (b) were written in English; (c) were published between 2019 and 2026; (d) scrutinized virtual influencers, digital or AI-generated influencers and their effect on digital marketing and consumer behaviour or tackled topics connected with digital-commerce; and (e) addressed at least one construct relevant to the review, like virtual-influencer characteristics, impulsive buying behaviour, trust, cultural values, semiotic interpretation, or consumer decision-making. On the other hand, the studies that were excluded were duplicates, non-peer-reviewed sources, conference abstracts, editorials, dissertations, or book reviews. Also, the works which focused only on technical AI development without relating it to marketing or consumer-behaviour, examined only human influencers or traditional celebrity marketing, or lacked sufficient methodological or theoretical work were left out.

5.3.2. Screening Procedures

All the extracted material were sent off to a review spreadsheet to ensure that there was no duplication. Then the evaluation of the remaining records was done in two stages. First, titles and abstracts were assessed according to the eligibility criteria followed by this study. Second, an examination was carried out to determine if the selected texts and documents were relevant to the research objectives and conceptual framework. On the other hand, the excluded texts were documented with the appropriate reasons for exclusion.

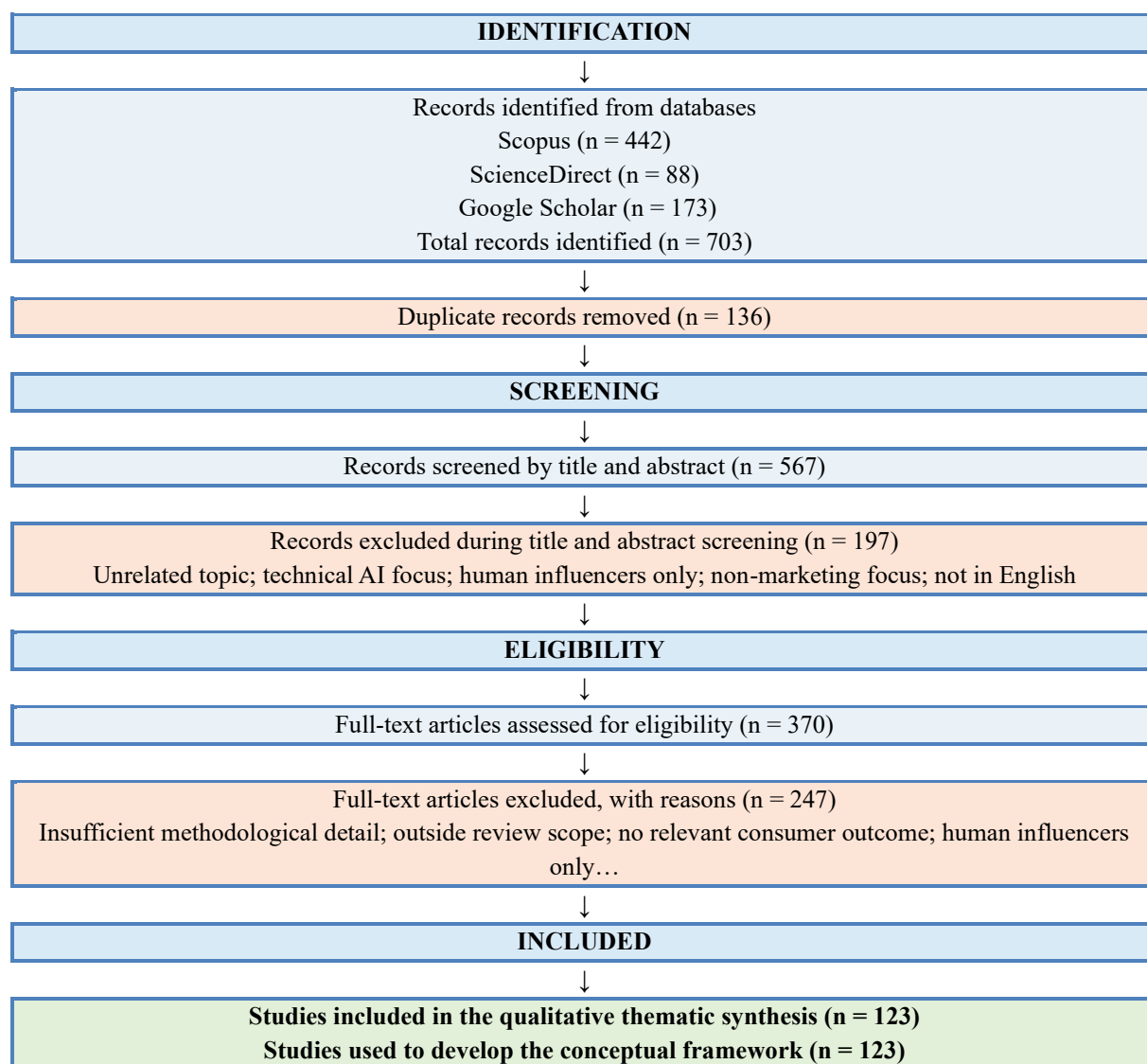


Figure 1. PRISMA flow diagram of the study-identification and selection process. Adapted from the PRISMA 2020 reporting framework (Page et al., 2021).

Figure 1 summarises the identification, screening, eligibility assessment, and final inclusion of studies in the systematic literature review. Records were retrieved from Scopus, ScienceDirect, and Google Scholar, after which duplicate records were removed. The remaining studies were screened by title and abstract before potentially eligible articles underwent full-text assessment. Articles that did not meet the predefined eligibility or quality criteria were excluded with documented reasons. The final review included 35 peer-reviewed studies, which were subjected to thematic synthesis and used to support the development of the proposed conceptual framework.

Reason for Full-Text Exclusion	Count
Human influencers only	150
Outside the scope of the review	35
Virtual influencers not the primary focus	25
No relevant consumer behaviour outcome	18
Insufficient methodological detail	10
Ineligible publication type	5
Full text unavailable	4
Total	247

Of the 370 full-text articles assessed for eligibility, 247 were excluded. The primary reasons for exclusion included studies focusing exclusively on human influencers ($n = 150$), studies outside the scope of the review ($n = 35$), studies in which virtual influencers were not the primary focus ($n = 25$), the absence of relevant consumer behaviour outcomes ($n = 18$), insufficient methodological detail ($n = 10$), ineligible publication types ($n = 5$), and unavailable full-text articles ($n = 4$). Consequently, 123 studies met all inclusion criteria and were included in the qualitative thematic synthesis and used to develop the proposed conceptual framework.

5.4. Data Analysis

After gathering the evidence from different studies, the collected data had to be assessed, and only reliable material was recorded in standardised extraction matrix. Then a thematic analysis was conducted using the Stimulus-Organism-Response framework.

5.4.1. Quality Assessment

There would be an assessment of the quality of the methodology and applicability of the collected materials by using a structured appraisal checklist. The checkpoints measure: the clarity of the research objective; the relevance of the design and method; the transparency of the sampling or data-collection procedure; the adequacy of the analytical approach; the consistency between the findings and conclusions; the theoretical contribution; and the relevance to virtual-influencer marketing and consumer behaviour. In conclusion, the study that was found to have major methodological limitations or insufficient information, was excluded, while a study with stronger and more relevant information was embraced and emphasised in the synthesis.

5.4.2. Data Extraction and Thematic Synthesis

The extracted data were recorded in a standardised extraction matrix. They include the author(s), publication year, country or research context, objectives, theoretical framework, methodology, sample characteristics where applicable, principal variables, major findings, and identified research gaps. As to the evidence collected from studies, it was synthesised according to themes rather than statistics because the included studies were broadly different in design, context, and measurement. Then, the findings were listed under the Stimulus–Organism–Response (S–O–R) framework. Under the first dimension, external stimuli, such as appearance, emotional storytelling, interactivity, and cultural symbolism were listed; under the second dimension went organismic processes, including emotional engagement, trust, perceived authenticity, and semiotic

interpretation; and under the third dimension behavioural responses, particularly impulsive consumer buying behaviour were recorded. Because the research focused on behavioural responses in different cultural contexts, there was special attention to Middle Eastern and culturally comparable contexts to identify context-specific patterns and research gaps.

6. HYPOTHESES DEVELOPMENT

According to the conceptual framework and the combination of S–O–R framework, semiotic theory, source credibility theory, and cultural dimensions, this study develops the following hypotheses to explain the relationships between characteristics ascribed to virtual influencers and the consumer's impulsive buying behaviour.

Direct Effect (Stimulus → Response)

Virtual-influencer characteristics such as appearance, storytelling, interactivity, and cultural symbolism are external stimuli that affect consumer behaviour. Prior research suggests that digital content that visually appeals to consumers and succeeds in engaging them can directly trigger emotional responses and spontaneous purchasing decisions.

H1: Virtual influencer characteristics have a significant positive effect on impulsive consumer buying behaviour.

6.2 Mediating Effect (Stimulus → Organism → Response)

Semiotic interpretation represents the internal cognitive and emotional processes through which consumers are able to decode the content of virtual influencers and give it meaning. This interpretive process shapes emotional engagement, perceived authenticity, and identification, which subsequently would influence how consumers behave.

H2: Virtual influencer characteristics have a significant positive effect on semiotic interpretation.

H3: Semiotic interpretation has a significant positive effect on impulsive consumer buying behaviour.

H4 (Mediation): Semiotic interpretation mediates the relationship between virtual influencer characteristics and impulsive consumer buying behaviour.

6.3 Moderating Effect of Trust

Consumer trust, grounded in source credibility theory, plays a crucial role in either strengthening or weakening the relationship between stimuli and the subsequent behavioural responses. In this sense, higher levels of trust are required in order to enhance the influence of virtual-influencer content on the consumer's impulsive buying behaviour.

H5: Consumer trust positively moderates the relationship between semiotic interpretation and impulsive consumer buying behaviour, such that the relationship is stronger when trust is high.

6.4 Moderating Effect of Cultural Values

Cultural values influence how consumers interpret and respond to marketing stimuli. In high-context and culturally sensitive environments such as the Middle East, VIs' cultural alignment is expected to strengthen the effectiveness of their content.

H6: Cultural values positively moderate the relationship between virtual influencer characteristics and semiotic interpretation, such that the relationship is stronger when cultural alignment is high.

7. DISCUSSION

This study synthesises the findings of existing literature about digital marketing and consumer behaviour to provide a theoretical understanding of how virtual influencers are able to influence impulsive consumer buying behaviour within digital environments. The findings indicate that virtual influencers operate as multifaceted marketing stimuli' that is, virtual influencers' effectiveness extends beyond superficial engagement and goes deeper to influence cognitive, emotional, and symbolic processes. In accordance with prior research, the analysis confirms what has been found before those constructs, such as trust, source credibility, and parasocial interaction, are primary factors in order to understand consumers' responses to digital influencers (Laszkiewicz & Kalinska-Kula, 2023; P & Kushwaha, 2023). Still, this research is grounded in the findings and can go beyond them by showing that consumers' responses are not standalone and should be embedded into the system

of interpretive and contextual factors.

From a theoretical perspective, the results support the validity and usefulness of the Stimulus–Organism–Response (S–O–R) framework in explaining its impact on consumers' behaviour when these are concerned with digitally mediated environments. Some of the characteristics adopted by VIs, such as attractiveness, interactivity, storytelling, or symbolism, would serve as external stimuli that would trigger internal organismic states. Then, the ignited inner feelings, such as emotional engagement, perceived authenticity, and trust, would finally lead to behavioural outcomes. However, and most importantly, the results suggest that the impulsive buying behaviour of consumers is not a simple and direct function of these stimuli, but rather the result of a mediated process depending on different contexts. That is, it extends the original use of the S–O–R model (Mc Andrew & Anderson, 1995; Verhagen & van Dolen, 2011).

One of the most important additions of this research is the demonstration of how semiotic interpretation works as a mediating process. Research results reveal that consumers will be influenced by virtual influencers in terms of consumer behaviour if some specific symbolic meanings are reflected in the visual and verbal cues they employ. Online consumers decode these symbols, which can be provided by the appearance, speech, and culture of virtual influencers (Arsenyan & Mirowska, 2021; Mc Andrew & Anderson, 1995). This process of giving meaning to given cues shapes the consumers' emotional responses and their behavioural intentions. Consequently, it demonstrates that consumer engagement is not driven solely by exposure, but it is also influenced by the interpretation of symbolic content (Moustakas et al., 2020). In this regard, semiotic interpretation operates as a critical link between external stimuli and impulsive behavioural responses, particularly in cultural contexts where meaning is loaded with social beliefs, traditions, and norms (de Mooij & Hofstede, 2011).

Furthermore, the analysis reveals that the degree of anthropomorphism plays a significant role in shaping this interpretive process. Human-like characteristics are important to create perceived social presence and enhance emotional engagement, which would facilitate stronger connections between the influencer and the consumer. On the other hand, the findings indicate that not only too much calibrated realism, but also poor representations may disrupt this process as it increases the consumer's awareness of artificiality. Such a conclusion would weaken perceived authenticity and reduce persuasive impact (H. Kim & Park, 2023; Lou & Yuan, 2019). This implies that the success of virtual influencers goes beyond simply maximising human similarity, for it includes the need to attain symbolic coherence, such as when the visual realism matches what consumers expect and what is related to their cultural heritage or background. The study also highlights that trust and source credibility are moderating variables in this model. Based on the source credibility theory, trustworthiness, expertise, and perceived authenticity are variables that significantly affect how consumers respond to virtual-influencer communication tools and content (Lou & Yuan, 2019; Ohanian, 1990). However, the results show two contrasting situations. On one hand, the control of message, consistency and low reputational risk give advantages to human-made virtual influencers in relation to their management (Arsenyan & Mirowska, 2021; Gerlich, 2023; Moustakas et al., 2020). On the other hand, their lack of humanity may lead to scepticism towards them (Lou & Yuan, 2019; Ohanian, 1990). Therefore, trust in virtual influencers cannot be assumed to be inherent, but it is built up when human-made virtual influencers receive a consistent symbolic representation and credible communication (Lou & Yuan, 2019; Ohanian, 1990). Therefore, trust binds semiotic interpretation and behavioural outcome in situations in which authenticity is a relevant evaluative dimension.

Equally important, the results also reveal that cultural context serves as an essential moderating variable in the Middle Eastern context. Generally, consumer responses can be presumed to be mediated by culturally deep-rooted values, social norms, and symbolic meanings. And this would further influence how consumers digest and evaluate the content adopted by virtual influencers (de Mooij & Hofstede, 2011).

In general, social interactions and human communications that take place in high-context cultures are loaded with implicit meanings and shared cultural understanding, and thus it is imperative for virtual influencers to be aligned with local values in terms of culturally meaningful visual stimuli and social norms to evoke in their audience emotional resonance and trust and enhance the power of persuasion effectiveness. Alternatively, cultural misalignment may trigger in VIs' audience cognitive dissonance and hence diminish consumers' engagement and behavioural responsiveness. To sum up, the results reveal that the impact of virtual influencers on consumers' impulsive buying behaviour can be conceptualised as a multidimensional and dynamic process

shaped by the interaction among visual stimuli, semiotic interpretation, trust, and cultural context. This integration of different dimensions advances existing literature, for it demonstrates that the responses of consumers to virtual influencers are not linear but emerge as a result of an interplay of multiple mechanisms operating simultaneously.

Overall, this study contributes to the growing body of research on the role of virtual influencers in marketing by providing a strong theoretical basis and context-sensitive framework that explain how digital personas can influence consumer behaviour. This study integrates semiotic theory, source credibility, and cultural dimensions within the S–O–R framework to offer a more comprehensive understanding of how virtual influencers can stimulate unplanned buying behaviour in their audiences, particularly when such communications take place within the underexplored Middle Eastern context. To achieve its objective, 35 studies have been peer-reviewed and then the findings have been systematically synthesised to advance understanding of the emerging power of virtual influencers in shaping consumer behaviour. The synthesis reveals that there is a growing body of research that have centred on the prevalence of key constructs such as trust, source credibility, parasocial interaction, and consumer engagement, and that more recent attention is given to anthropomorphism, authenticity, and technologically mediated interaction that take place within digital marketing environments (Laszkiewicz & Kalinska-Kula, 2023; Pushparaj & Kushwaha, 2024). These findings confirm that virtual influencers are increasingly accepted, used, and positioned as influential communication agents who can control consumer perceptions and behavioural outcomes.

The analysis highlights that the degree of effectiveness of virtual influencers is rooted in the thin line between their human-like characteristics and their inherent artificiality. Consumers tend to apply to virtual influencers social heuristics which are typically reserved for human interactions, such as trust evaluation, identification, and relational bonding to virtual entities, thereby making of these digital personas' credible social actors (H. Kim & Park, 2023; Lou & Yuan, 2019). This supports prior research which proposes that the anthropomorphic design and parasocial interaction mechanisms applied to virtual influencers enhance consumer engagement and persuasion (Lou & Yuan, 2019; Schouten et al., 2020). However, the findings also show inconsistencies in how consumers perceive and respond to virtual influencers, which reveals that their impact is neither unchanging nor universally positive (Ameen et al., 2023).

A key contribution of this study is that it extends the discussion beyond general engagement outcomes to focus specifically on the consumer's impulsive buying behaviour. The findings suggest that virtual influencers use visually appealing content, emotionally engaging narratives, and symbolically rich communication to stimulate the consumer's spontaneous purchasing decisions. In line with the Stimulus–Organism–Response (S–O–R) framework, the characteristics embedded in virtual influencers act as stimuli that trigger in their audiences internal affective and cognitive processes, such as emotional arousal, identification, and perceived authenticity, which subsequently induce their impulsive behavioural responses (Mc Andrew & Anderson, 1995; Verhagen & van Dolen, 2011). This once more supports the claim that impulsive buying behaviour in a digital environment is primarily the result of an emotional response triggered by stimuli.

Also, and equally importantly, the research reveals that semiotic interpretation works as a filter or mediator in this process. Virtual influencers convey information through semiotic codes, such as appearance, language, and culture, to which consumers generally relate to and interpret in order to assign meaning to it, evaluate its authenticity, and act accordingly. These interpretative processes determine the type of emotional engagement and subsequent behavioural response. Hence, the focus is shifted to semiotics as the mechanism through which the content virtual influencers use can be translated into impulsive buying behaviour. This finding adds to the existing literature on virtual influencers by highlighting the importance of the process of meaning-making or content, rather than image exposure, in influencing consumer behaviour.

The findings contribute significantly to the huge body of literature on the subject by highlighting the effect of trust and source credibility on how consumers interact with virtual influencers. While some research has suggested that virtual influencers may be viewed as more trustworthy due to their controlled nature and lack of personal bias, other research has shown that their artificial nature does undermine their trustworthiness and cause scepticism among their consumers (Gerlich, 2023). These two lines of literature appear to highlight a key debate within the literature, suggesting that trust is not seen as naturally existing, but as something that is constructed and designed through consistent source messaging, a realistic source representation and transparent communication (Lou & Yuan, 2019; Ohanian, 1990). Therefore, the presence of conflicting evidence once

again highlights the need to treat trust as a conditional factor rather than an unconditional outcome.

Furthermore, the degree of anthropomorphic characteristics seems to affect consumers' perceptions of VIs. On one hand, human-like characteristics may improve their relatability and emotional appeal; on the other hand, too much artificiality or exaggerated human-like features may weaken consumers' perceptions of these personas' authenticity and decrease their persuasive power. This implies that the success of VIs is not achieved by maximising human likeness while designing them, but rather by reaching a balance between realism and artificiality. From a situational perspective as of the Middle East, the findings also emphasise the significance of cultural relevance of virtual influencers, where consumer responses to these personas are influenced by cultural values, social norms, and symbolic meanings. Therefore, the digital content should be incorporated to be interpreted and evaluated accordingly (De Mooij, 2019; de Mooij & Hofstede, 2011).

Virtual influencers that reflect culturally relevant cues through their appropriate visual representation and culturally sensitive messaging, are more likely to be perceived as authentic and trustworthy, and this would enhance their persuasive effectiveness. Conversely, cultural misalignment may weaken consumer engagement and reduce their behavioural responsiveness. Overall, the findings propose that the influence of virtual influencers on consumer behaviour is best described as a multidimensional and context-dependent process. Their degree of this influence is shaped by the interaction between visual stimuli, interpretive mechanisms, trust, and cultural factors. This study focuses on integrating these dimensions within a unified framework in order to provide a comprehensive explanation of how virtual influencers can control the consumer's impulsive buying behaviour in digital environments, particularly when applied to the underexplored Middle Eastern context.

7.1. Comparative Interpretation of the Findings

All the reviewed literature defines virtual influencers as persuasive digital endorsers who become effective when several characteristics, such as visual appeal, narrative communication, interactivity, perceived authenticity, and cultural relevance, interact together. However, studies differ when focusing on details. Studies that emphasise the appearance of VIs and the quality of their design quality report that there would be stronger initial attention, much favourable attitudes, and consequently more purchase responses. In contrast, studies that focus on relationships or psychological mechanisms pinpoint that appearance and visual attractiveness alone does not ensure sustained consumer engagement. Their findings indicate the importance of emotional storytelling, perceived social presence, credibility, and interpersonal connections in developing buying intention or impulsive behaviour. In other words, the interpretations of these studies suggest that appearance may be most influential at the attention stage, whereas emotional, psychological, and relational factors are essential in trespassing attention into behavioural responses.

The reviewed studies also differ in their viewpoints towards artificiality. On one hand, there are studies that assume that well-controlled and carefully prepared and designed virtual influencers would fortify brand consistency, lower the reputational risk factor and help the delivered messages meet specific audience preferences. On the other hand, there are studies that argue that a VI's artificiality negatively affects authenticity and trust, and thus, it loses consumers' emotional attachment since they see the influencer as being designed and be commercially manipulated without any genuineness. These two studies are apparently contrasting but not necessarily contradictory. The outcome is due to differences in communication strategies, type of product, consumers' age, openness to digital platforms and technological innovation, and prior exposure to virtual characters. The artificiality that VIs reflect may therefore function as either an advantage or a liability depending on how consumers perceive and interpret the virtual influencer: creative and transparent or deceptive and overly controlled.

The same discrepancies in findings about interactivity are also observed. There are the studies that argue that responsive communication, personalised messages, and social-presence cues lead to stronger consumer engagement and more favourable reactions. However, other studies imply that high interactivity from a digital entity appears automated and for commercial reasons, and so they cannot create trust. This inconsistency raises the need to focus on the quality and perceived sincerity of interaction rather than on the interaction frequency. In other words, virtual influencers may influence consumers' impulsive buying only when their interactions look real, meaningful and show psychological involvement rather than being superficial and fake.

A third discrepancy is related to trust and authenticity. Some studies believe that trust is a must and a direct predictor for any future purchase intention, whereas others perceive trust as a mediating mechanism which links the characteristics of virtual influencers to the behavioural outcomes of consumers. A further perspective suggests that consumers can still respond to VIs in a positive way although the influencer appears artificial and commercially driven just because the character is entertaining, abiding to culture, visually acceptable, and transparent about its digital identity. This implies that authenticity in virtual-influencer marketing may not require that the digital character looks human but rather, it shows consistency and coherence among the influencer's visual identity, communication style, values, and brand relationship.

Concerning cultural changes, the findings are more limited and less consistent than the findings which are related to appearance, trust, or engagement. Most of the available studies have been carried out in Western or East Asian settings. Therefore, their results cannot be applied directly to Middle Eastern consumers. There is a consensus among all the studies that when VIs appear culturally acceptable as to symbols, language, dress, values, and communication styles, the messages they convey are more welcome. Nevertheless, the degree by which these messages are accepted differ across settings. This may be explained since there are variations within the Middle East itself. There are different nationalities, religions, age groups, gender norms, as well as digital familiarity, and levels of openness to culture. Consequently, the Middle East should not be treated as a homogeneous cultural market.

The last point of comparison is between planned purchase intention and impulsive buying behaviour. Most of the studies have measured attitudes, engagement, brand evaluation, or general purchase intention, but very few have tackled immediate, unplanned purchasing responses. Findings from planned-intention studies may therefore overstate their relevance to impulsive consumption. Impulsive buying is more likely to take place when there is a persuasive stimulus which in turn generates a rapid emotional arousal, which reduces deliberate intentions, perceived urgency, or symbolic self-relevance. This supports the importance of using the Stimulus-Organism-Response framework, because it explains how the characteristics of virtual influencers act as external stimuli, how consumers interpret them through emotional, semiotic, and cultural processes, and how these internal states may produce spontaneous behavioural responses.

7.2. Explaining Inconsistencies Across Studies

The differences in findings across the literature can be pertained to four main sources. First, studies have used different ways to define and measure the effectiveness of virtual influencers, ranging from engagement and credibility to purchase intention and actual behaviour. Second, the methodology used by different studies vary widely, including cross-sectional surveys, experiments, content analyses, and conceptual studies. Third, the reviewed research is done using different platforms, kinds of products, and types of virtual influencers, which make the results context dependent. Fourth, the studies have treated cultural and demographic differences as control variables rather than theoretically examined boundary conditions. These variations make it difficult to conduct a direct comparison and thus to help explain why the same characteristic, such as realism or attractiveness, is beneficial in one study but insignificant or negative in another.

Realism provides a clear example. The more virtual influencers appear human the more they look familiar and solidify their social presence. However, excessive realism can bring an opposite effect. When consumers notice inconsistencies in movement, expression, or communication, they become uncomfortable and sceptic. Similarly, emotional storytelling may strengthen attachment when promoting for pleasure-oriented goods, while the same strategy can have a weaker effect when promoting for functional products since in this case expertise and informational value are more important. These contrasting perspectives indicate that the effects of virtual influencers are conditional rather than universal. Future theory should therefore move beyond asking whether virtual influencers are effective and instead examine when, for whom, and under what cultural and commercial conditions they influence behaviour.

8. IMPLICATIONS

The present dissertation makes several important theoretical contributions to the emerging literature on the effect of using virtual influencers in marketing and its influence on consumer behaviour. And more importantly,

its results could be practically utilized by marketers and brand owners while making their digital strategies for better sales. This study extends existing research by explicitly incorporating the consumer's impulsive buying behaviour as a central outcome variable within the context of virtual influencers. While prior studies have largely focused on the attitudes, engagement, and purchase intentions of consumers, this study advances the field by examining their immediate, affect-driven behavioural responses, and how such responses call for a more nuanced understanding of consumer decision-making in digital environments (Rook, 1987; Verhagen & van Dolen, 2011).

Second, this study contributes to theory by focusing on the importance of integrating semiotic interpretation within the Stimulus–Organism–Response (S–O–R) framework. It positions semiotic interpretation as a mediating mechanism when demonstrating how consumers actively decode symbolic cues that are embedded in virtual influencers to construct meaning, evaluate authenticity, and form their behavioural responses (Mc Andrew & Anderson, 1995; Moustakas et al., 2020). Also, this research extends the traditional applications of the S–O–R model by incorporating a meaning-making perspective. In short, this paper highlights the fact that not only exposure to stimuli alone but also interpreting these cues is what shapes consumer behaviour.

Third, the study advances the literature by including both source credibility theory and cultural dimensions theory within a unified conceptual framework. Specifically, it examines the concept of trust as a moderating variable that would strengthen the relationship between semiotic interpretation and behavioural outcomes (Lou & Yuan, 2019; Ohanian, 1990), while it stresses the significance of cultural values in shaping how the content adopted by virtual influencers is interpreted and evaluated across diverse contexts (de Mooij & Hofstede, 2011). This trans-dimensional integration offers a more comprehensive explanation of how consumers behave in digital environments, specifically when targeting those who live in culturally safe environments.

Finally, this work adds to the limited stream of research that tackles the Middle Eastern setting. The Middle East has been relatively neglected in research in spite of the fact that it is undergoing a significant rate of digital transformation and high social media use. Therefore, by adding cultural and symbolic dimensions that are specific to the Middle Eastern region, the current thesis offers a context-sensitive theoretical perspective that contributes to the generalisability and applicability of virtual influencer research beyond the Western models.

9. RECOMMENDATIONS

The results may provide important implications for marketers, brand managers, and digital strategists who wish to successfully utilise virtual influencers. First, marketers need to focus on developing high-context virtual influencers. Given the high degree of influence of cultural values on how people make sense of meaning, virtual influencers need to be developed with culturally suitable features regarding language, clothing, and social norms in order to appear authentic and meaningful to consumers, especially in high-context markets, such as the Middle East (De Mooij, 2019). On the contrary, cultural misalignment may reduce customers' trust and weaken their online engagement. Second, the data collected highlight the importance of VIs' emotional storytelling and symbolic communication. Virtual influencers should be constructed not only as visual entities but as personas that convey meaning. These personas employ narratives, aesthetics, and interactions to create emotionally engaging experiences. Such symbolic richness enhances semiotic interpretation and hence increases the possibility of consumers' impulsive responses.

Third, building and maintaining consumer trust is essential in order to make virtual influencers more effective. Marketers should work on improving the consumer's perceived credibility through the consistent messaging, transparency, and coherent identity construction of virtual influencers. This is of utmost importance, as trust significantly strengthens the relationship between the influencer content and behavioural outcomes (Lou & Yuan, 2019; Ohanian, 1990), especially because of the artificial nature of virtual influencers, which may otherwise generate doubt and scepticism. Finally, the results suggest that marketers should carefully adjust the level of anthropomorphism when designing virtual influencers. While the VIs' human-like characteristics can make audiences feel related and emotionally connected, excessive realism may reduce perceived authenticity and weaken their influence on marketing decisions (H. Kim & Park, 2023). Therefore, it is vital that marketers should achieve a balance between realism and artificiality in order to make virtual influencers credible and ensure maximum consumer response. Overall, this study provides actionable insights for developing strategic, culturally sensitive, and psychologically effective virtual influencer campaigns that can stimulate the

consumer's unplanned, impulsive buying behaviour in the metaverse.

9.1. Directions for Future Empirical Research

Future research should test the proposed relationships by using controlled stimulus-based experiments. In such experiments, participants view standardised content delivered by a virtual influencer, and then they report their emotional, semiotic, cultural, and behavioural responses. Through manipulating appearance realism, storytelling style, interaction cues, disclosure, gender presentation, and cultural symbolism, researchers would establish causal effects in a more convincing way than through cross-sectional surveys.

Another significance of empirical studies is that they would help distinguish impulsive buying from general purchase intention. This can be done through measuring immediate purchase urge, unplanned choice, willingness to buy without prior consideration, and, where feasible, actual click-through or purchase behaviour. By using longitudinal and field-based designs, researchers could examine whether initial curiosity can develop into sustained trust, attachment, repeat engagement, and purchase over time. Also, when survey measures are combined with behavioural data from social-commerce platforms, reliance on self-reported intentions will be reduced.

Within the Middle Eastern context, future studies should take into consideration that the Middle East is not a single cultural unit but a region with multiple mindset and tendencies. Applying multi-group analysis could test whether relationships differ according to nationality, gender, age, religiosity, cultural conservatism, social-media experience, and masculinity-femininity orientation. Researchers should also examine how the visual symbols loaded with cultural cues, language, dress, family values, and emotional narratives can strengthen persuasion or, on the contrary, create resistance when they are perceived as stereotypical or commercially exploitative.

Further work is needed to clarify the role of semiotics in impulsive buying responses. Researchers could experiment how consumers decode colours, clothing, gestures, voice, setting, and logos, and analyse narrative symbols at both the denotative and connotative levels. Then researchers examine how these interpretations mediate the relationship between the characteristics of virtual influencers and impulsive buying. By conducting qualitative interviews or focus groups first, researchers could identify culturally meaningful signs. This will be followed by quantitative validation and structural-equation modelling.

Future empirical models should compare alternative mechanisms instead of assuming a single pathway. For example, trust, perceived authenticity, emotional attachment, social presence, and semiotic interpretation may operate as parallel or sequential mediators. Cultural orientation may also moderate different stages of the process. Multi-group PLS-SEM, moderated mediation, or experimental conditional-process analysis would help determine which mechanism is most influential under specific conditions.

Finally, research should compare virtual influencers with human influencers and other types of virtual influencers, including highly realistic digital humans, stylised characters, brand-owned avatars, and independent virtual personalities. Such comparisons are essential in order to clarify the drive behind consumer responses, whether it is due to artificiality itself or design quality, disclosure, brand fit, narrative consistency, and cultural congruence. The outcome would provide brand owners and marketers with stronger practical guidance for a more responsible and effective use of virtual influencers in culturally diverse markets.

9.2. Limitations of the Systematic Review

This systematic review has several limitations. First, the search depended only on English-language publications; that it is excluded relevant Arabic-language or regionally published research. The result would lead to language bias. Second, the review focused mainly on peer-reviewed journal articles; therefore, it excluded conference proceedings, industry reports, working papers, and doctoral research, and missed all the evidence emerging from them. Third, although several databases were searched, no database provides complete coverage. Also, some relevant studies were missed because of differences in indexing or terminology. Fourth, the field of study is considered as relatively new and conceptually fragmented. Studies use overlapping terms such as virtual influencer, AI influencer, computer-generated influencer, digital human, and virtual avatar, which may negatively affect search sensitivity and comparability. Fifth, the included studies vary in design, sample, platform, product category, cultural context, and measurement. Consequently, they prevent statistical meta-analysis and limit the ability to estimate pooled effect sizes. Sixth, much of the available evidence is

cross-sectional and based on self-reported purchase intention rather than observed impulsive buying behaviour. The outcome would create common-method bias and intention-behaviour inconsistency. Seventh, there is little evidence collected from Middle Eastern consumers. As a result, some interpretations that draw on findings from other cultural contexts should not be uncritically generalised to the region. Eighth, the review's thematic synthesis involves researcher judgement when grouping constructs and interpreting relationships. Then a structured protocol that improves transparency, complete elimination of interpretive subjectivity is not possible. Finally, the review covers publications up to 2026. This eliminates recent studies that would have altered the evidence base, taking into consideration the rapid development of generative artificial intelligence, social-commerce platforms, and virtual-human technology.

10. CONCLUSION

The present research provides a theory-based, comprehensive understanding of how virtual influencers influence the consumer's impulsive buying behaviour in digital communications, with particular emphasis on the Middle Eastern context. The study examines existing literature and integrates multiple theoretical perspectives; it builds on the current knowledge on virtual influencer marketing by moving beyond traditional outcome variables, such as attitudes and engagement, to focus on consumers' immediate, emotional, behavioural responses.

The results confirm that virtual influencers are strong digital stimuli. The visually appealing content and symbolically meaningful communication embedded in them would stimulate consumer behaviour. Nevertheless, the influence of virtual influencers is not generated directly, but it requires a complicated process topped by semiotic interpretation where consumers interpret the visual and cultural content of virtual influencers and assign meaning to it. The semiotic interpretation process is vital for consumers to see virtual influencers as authentic and feel emotionally connected to them, which in turn is likely to trigger their impulsive purchase.

In addition, there are the contextual factors, primarily trust and cultural values, that influence consumer responses. Trust is an important variable that enhances the relationship between content embedded into virtual influencers and consumer behavioural outcomes only if marketing is conducted in environments that value authenticity and credibility (Lou & Yuan, 2019; Ohanian, 1990). Equally important, cultural values especially in high-context countries like the Middle East do affect the consumer interpretation of symbolic cues. This makes marketers look for culturally aligned and context-sensitive marketing strategies (De Mooij, 2019; de Mooij & Hofstede, 2011). By combining semiotic theory, source credibility theory, and cultural dimensions within the Stimulus–Organism–Response (S–O–R) framework, this study offers a multidimensional explanation of the effectiveness of virtual influencers.

The proposed framework demonstrates that impulsive consumer buying behaviour is the result of the interaction between external stimuli (virtual influencer characteristics), internal interpretive processes (semiotic interpretation), and moderating contextual factors (trust and culture). The integration of multiple theories offers an added value to theory and practice in terms of a more comprehensive understanding of consumer behaviour in digitally mediated consumption.

Alongside the study's contributions, there are certain limitations that should be noted.

First of all, this is a systematic literature review, so the study's findings are constrained by the breadth and depth of the related studies.

Secondly, the empirical studies are constrained to the impulsive buying behaviour in non-Western contexts. Therefore, future studies are called for to empirically test the conceptual model in this study by applying quantitative methods, i.e., Structural Equation Modelling (SEM), to prove the study's hypotheses in different circumstances.

Besides, the influence of emerging technologies, i.e., artificial intelligence and augmented reality, on the effectiveness of virtual influencer in different cultures should be further studied.

In conclusion, this research notes and highlights the emergence of virtual influencers as a new form of marketing strategies in the digital economy. Through the illustration of how symbolic meaning, emotional appeal, trust, and cultural congruence influence consumers' impulsive behaviour, this research offers important contributions to academics and practitioners who are interested in exploring and applying virtual influencers in the marketplace.

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