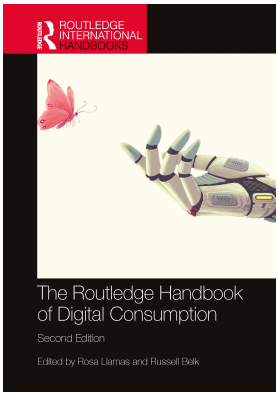

The Routledge Handbook of Digital Consumption

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Models of Viral Propagation in Digital Contexts

Publication details
https://test.routledgehandbooks.com/doi/10.4324/9781003317524-45
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Published online on: 26 Sep 2022

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MODELS OF VIRAL PROPAGATION IN DIGITAL CONTEXTS

How Messages and Ideas—From Internet Memes to Fake News—Created by Consumers, Bots, and Marketers Spread

Tien Ee Dominic Yeo

Viral propagation refers to the process of repeated communication, often with varying degrees of replication and modification, of a message and its attendant idea from one person to another. Since the turn of the millennium, a confluence of digital cultural practices and technological affordances have engendered the rise of non-commercial, peer production, and distribution of media contents through viral propagation. Considering the prominence of viral propagation in digital contexts, it is easy to neglect that viral propagation has been an age-old phenomenon. Legends, folklores, rumors, and gossips provide longstanding precedents of virally propagated narratives that have been studied by scholars for several decades. The difference is that viral propagation has become more visible and extensive in digital contexts as the dissemination of messages is much faster, more scalable, and better coordinated. The accessibility and prevalence of digital authoring tools, media-sharing platforms, and social network sites afford the means for consumers to easily create and share their content and messages (see Lanier *et al.* in Chapter 30). The user interface of media-sharing platforms plays an explicit role in encouraging greater consumer participation by signaling the opportunities to engage in actions that could satisfy both individualistic and relational needs. The data management capabilities of social network sites, driven by mathematical algorithms, further facilitate the rapid propagation of consumer-generated messages along links established among users (see Colleoni and Corsaro in Chapter 13).

Despite more favorable conditions for viral propagation in digital contexts and considerable research into the processes involved, it remains an elusive phenomenon that can neither be predicted nor controlled by researchers or practitioners. As much as digital channels help to multiply the impact of viral propagation, they also accentuate the potential fallout from poorly executed viral campaigns or unintended viral messages. More worryingly, viral propagation in digital contexts has enabled the unrestrained spread of malicious messages that promote undesirable or harmful ideas and behaviors such as conspiracy theories, vaccine skepticism, and hate speech (O'Callaghan *et al.*, 2015). The unpredictability of viral

DOI: 10.4324/9781003317524-45

propagation coupled with its potential prevalence and impact on public discourse and consumer behaviors warrant a more precise understanding of its nature and process. Toward this end, a large corpus of empirical studies across several disciplines has proffered many determinants and characteristics of viral propagation. However, the lack of an integrative overview of this vast body of scholarship has left us with knowledge silos of the phenomenon. The goal of this chapter is to facilitate, primarily but not exclusively, marketing communication research and practice on viral propagation by explicating its conceptual foundations and the factors that shape its manifestation in digital contexts.

While preserving the focus of the original version of this chapter in providing theoretical explanations and comparative historical analysis for contemporary viral propagation (Yeo, 2013), this chapter has been thoroughly revised and updated with the latest conceptual and empirical developments. The chapter comprises two main sections. The first section synthesizes a broad range of conceptual and empirical works in extant literature to highlight the most salient theoretical explanations of the nature and process of viral propagation. Besides consolidating and refreshing the theoretical frameworks discussed in the original version, this chapter introduces a new model of viral propagation that speaks to the influences of algorithmic structures and artificial intelligence. The four perspectives that are synthesized—memetic, affective, networked, and algorithmic—reflect pertinent cultural, psychological, sociological, and computational processes respectively. The second section reflects on the promises and pitfalls of viral propagation in the digital age. It assesses not just the impacts of viral propagation but also the changes to the phenomenon itself over the last decade since this chapter was originally written. Gaps in our knowledge and potential directions for future studies are explored in the conclusion.

Theoretical Models of Viral Propagation

The phenomenon of viral propagation has attracted considerable multidisciplinary research interests—most notably, sociology, anthropology, psychology, marketing, communication, cultural studies, and computer science. Questions regarding viral propagation can be broadly summarized in terms of what, who, when, where, why, and how: *what* gets propagated (types of messages and ideas that frequently become propagated); *who* is involved in the propagation (opinion leaders, mavens, early adopters, well-connected super spreaders, etc.); *when* does viral propagation arise (the circumstances leading to the generation and spread of messages); *where* does viral propagation occur (the features of diffusion networks such as personal social networks, online communities, etc.); *why* do individuals propagate messages (their motives, goals, and desires); and *how* are messages propagated (the mechanisms and modes of transmission).

Meanwhile, research approaches and related theoretical models of studying viral propagation can be loosely organized by their focus on one of the following primary objects of analysis: messages, individuals, networks, and data. It should be noted that these four models are not mutually exclusive but are distinguished by their respective focus. The memetic approach of examining viral propagation in terms of messages has been to distill the message characteristics, including the participatory cultural contexts that induce consumers to pass them on. Such investigations are often conducted alongside the affective approach of assessing the role of emotions vis-à-vis other salient psychological antecedents and consequences of individuals who pass on viral messages. Turning to the social networks where messages are propagated, the networked approach has been to assess how social connections precipitate the diffusion of messages. Finally, in terms of the encompassing data of viral propagation in

Table 38.1 Four Models of Viral Propagation in Digital Contexts

	Memetic	*Affective*	*Networked*	*Algorithmic*
Focal question	What	Why	Who/Where	How
Object of analysis	Message characteristics	Consumer psychology	Social network dynamics	Trace data
Determinant of virality	Social relevance and cultural resonance	Emotional valence and arousal	Relational ties	Filtering and recommendation
Item(s) transmitted	Memes	Emotions	Information	Content
Propagation mechanism	Participatory culture	Emotional contagion	Word-of-mouth cascade	Algorithmic culture

Source: Own elaboration.

digital contexts, the algorithmic approach is to appreciate the invisible algorithms and their artificial intelligence applications in data management that promote the rapid and widespread diffusion of certain messages. The respective mechanisms of propagation involved are namely participatory culture, emotional contagion, word-of-mouth cascade, and algorithmic culture (see Table 38.1).

Memetic Viral Propagation

Originally conceived as the cultural equivalent of genes (Dawkins, 1976), memes provide a useful catch-all term for all sorts of messages, ideas, behaviors, or cultural elements that are imitated and spread among consumers. Using the metaphor of social epidemiology, proponents of memetics (e.g., Blackmore, 1999) assert that memes represent contagious thoughts (Lynch, 1996) or mind viruses (Dawkins, 1993) which promote their own replication by inducing their hosts (the minds of individuals) to propagate them. While the social epidemic metaphor of viral propagation provides an intuitive description of the phenomenon, the epidemiological model of person-to-person message dissemination is untenable in its disregard for the agency of individuals who pass on messages. Social scientists further eschew the approach because of its problematic and ambiguous ontological assumptions that cultural ideas can be divided up into discrete and independent entities that are replicated and propagated with a high level of fidelity (Shifman, 2014). Nevertheless, the focus of the memetic perspective on spreadable message features persists in the form of two approaches, which are referred as the message design approach and the cultural re-presentation approach in this chapter.

The message design approach entails identifying the "viral" quality of messages and effective creative strategies in viral advertising. For instance, researchers highlight the positive influences of narrative transportation or being immersed in the world of a story (Chen and Lee, 2014) and paratextual features of social media (e.g., the number of likes), on viral advertising (Seo *et al.*, 2018). As the message design approach is primarily concerned with content creation and advertising strategies that can make marketer-generated messages go viral, these studies typically neglect how meanings are created, evolved, and spread among consumers as the message propagates. By prioritizing what viral messages do to consumers over what consumers do to viral messages, these studies inadvertently treat individuals' understandings of the viral message as almost identical throughout a group and assume the message to be minimally transformed as it is virally propagated.

The cultural re-presentation approach offers a more contextually sensitive and consumer-agentic alternative to the message design approach by conceiving the viral propagation of a message as a participatory cultural practice of re-presenting that message. In a bid to distinguish themselves from the message design approach (which tends to use the "viral" descriptor), proponents of the cultural re-presentation approach have come to embrace the "meme" descriptor given its widespread popularity among Internet users (Shifman, 2014) and that alternative descriptors such as "spreadable media" (Jenkins, Ford and Green, 2013) had failed to take off. Reclaiming the descriptor from memetics, Shifman (2014, p. 41) defines Internet memes as:

> (a) a group of digital items sharing common characteristics of content, form, and/or stance, which (b) were created with awareness of each other, and (c) were circulated, imitated, and/or transformed via the Internet by many users.

Departing from the focus on the attributes of messages that had successfully gone viral, this growing line of research emphasizes the salience of consumer participation through examinations of creative activity that occurred around these messages and how they became influenced by social and cultural contexts at the time of production (Yeo, 2010; Shifman, 2012; Wiggins and Bowers, 2015). Viewed from this lens, a highly significant quality for going viral is based on how the item becomes elaborated within the group it is popular with. This entails examining what individuals find salient, meaningful, and useful about the item that is being virally propagated (i.e., its social relevance and cultural resonance). For instance, in a study of how a Reddit community assigns value to viral media, Literat and van den Berg (2019) identified four salient features that determine a meme's value: its positioning vis-a-vis the mainstream, versatility and expansion potential, topicality or cultural relevance, and perceived quality.

Affective Viral Propagation

The affective perspective of viral propagation pertains to the idea that individuals are driven to generate and spread certain messages in response to the emotional valence and arousal of an event, situation, or consumption object. The earliest proponent of this notion is Prasad (1935) who proposes that a typical situation that leads to the generation and propagation of rumors: (a) sets up an emotional disturbance; (b) is of an uncommon and unfamiliar type; (c) contains many aspects unknown to the individuals affected; (d) contains several unverifiable factors; and (c) is of group interest. While many psychologists have echoed the similar idea that rumors arise and propagate in response to uncertainties or anxieties (Allport and Postman 1945; Rosnow 1991), it was Festinger's (1957) theory of cognitive dissonance that inspired the development of emotional discrepancy theories. The theory of cognitive dissonance posits that people are motivated to change their cognitive beliefs or behaviors to reduce the tension caused by holding conflicting ideas simultaneously. It was originally proposed by Festinger (1957) to explain the circulation of rumors after an earthquake. He suggests that people who escaped the earthquake unharmed began to circulate rumors about unforeseeable calamities to reduce their unjustified feelings of fear. Expanding on the theory of cognitive dissonance, emotional arousal (or discrepancy) theories propose that emotions arise when information violates expectations. To resolve the event or belief discrepancies, people are prompted to share and talk about their experiences of the situations from which the emotions arise. Harber and Cohen (2005) contend that this intrapsychic need to share emotional experiences with others drives viral propagation of messages.

There has been mounting empirical support for the emotional driving force of expectation violations on forwarding behaviors in a range of contexts. Heath (1996) demonstrates that in domains that were emotionally positive people prefer to pass along news that was exaggeratedly positive and in domains that were emotionally negative the preference was for exaggeratedly negative news. In a content analysis of the most recommended *New York Times* articles, Berger and Milkman (2012) found that in addition to valence (positive content is more viral than negative content), content evoking high arousal emotions (awe, anger, or anxiety) is more viral than that evoking low-arousal or deactivating emotions such as sadness. Their experimental results further illustrate the causal impact of specific emotion on virality, driven by the level of activation induced. Replicating this study in the German context, Heimbach and Hinz (2016) further shows that the relationship between positivity and virality follows an inverted U-shape pattern.

Besides providing the motivational drive for propagating messages, the affective perspective further suggests that emotions themselves are propagated (Rimé, 2009). This emotional contagion is said to occur when both sender and receivers jointly experience a similar emotion (Howard and Gengler, 2001). Pointing to the socializing function of shared emotions, Heath, Bell and Sternberg (2001) propose that memes are frequently selected and retained because they evoke an emotional reaction that is widely shared across people. They argue that consumers may choose to pass along certain messages that generate emotions not because they enjoy consuming the emotion directly but because the shared emotion enhances their social interactions. In this regard, re-telling stories that tap onto certain emotions allows consumers to entertain or sustain the listener's attention and enhance their mutual relationships (Guerin and Miyazaki, 2006). A recent empirical validation and advancement of the concept of emotional contagion in the context of social media was a large-scale experimental study, which demonstrates that emotions expressed by others on Facebook can influence people's own emotions without their awareness or direct interaction between people (Kramer, Guillory and Hancock, 2014). In recent years, many studies have attempted to translate the affective perspective into strategies to enhance viral propagation of advertising on social media. For instance, Nikolinakou and King (2018) illustrated through an online experiment that awe and affection can prompt viral sharing through activating specific sharing expressions. Researchers have also sought to extend the affective perspective by investigating how individuals' motivations (Borges-Tiago, Tiago and Cosme, 2019) and personality (Kulkarni, Kalro and Sharma, 2020) vis-à-vis emotional content affect their willingness to share viral messages.

Networked Viral Propagation

The networked perspective of viral propagation regards the phenomenon as runaway word-of-mouth referrals or an information cascade, which "occurs when an individual is persuaded by friends to share information with other friends" (Chesney, 2017, p. 54). Drawing on diffusion of innovation theory and network analysis, Hemsley and Mason (2013) identifies three key characteristics of a "viral information event": (a) word-of-mouth cascade, whereby messages are actively forwarded from one person to others, (b) fast speed, as facilitated by digital technologies, and (c) broad reach, as achieved by bridging multiple weakly connected personal social networks. The conceptual foundation for this perspective is Katz and Lazarsfeld (1955) seminal work on the role of personal influence in mediating the direct effects of mass media messages on consumers. According to their two-step flow model, information flows from mass media to individuals (opinion leaders) who then pass it on to others along

with their own interpretations. The two-step flow model had inspired the field of diffusion research (Gatignon and Robertson 1985; Rogers 1962), which in turn has informed us of the role of social networks and influential individuals on the adoption and spread of ideas and messages.

Diffusion research directs our attention to three aspects of viral propagation. The first aspect pertains to the circumstances surrounding the message being shared that influence individuals to propagate it. Viral propagation or word-of-mouth behavior constitutes a form of social exchange (Gatignon and Robertson, 1986) which is part of consumers' everyday communicational and relational practices (Carl, 2006). Many scholars have pointed to the instrumental value of providing information or exchanging resources during peer-to-peer dissemination of messages such as rumors (Rosnow, 1991) and urban legends (Donavan, Mowen and Chakraborty, 1999, 2001). Allport and Postman (1945) argue that rumors spread because people seek to understand and simplify complicated events. Rumors, therefore, tend to develop when there is an unsatisfied demand for news and disappear when the demand drops or supply becomes adequate (Shibutani, 1966). Individuals who are more individualistic or altruistic tend to propagate more messages than others (Ho and Dempsey, 2010). In contrast, consumers with stronger needs for uniqueness tend to avoid propagating positive word-of-mouth of their possession as it reduces its uniqueness (Cheema and Kaikati, 2010). In this regard, Berger (2014) argues that the choice of subject of people's word-of-mouth communication is inadvertently driven by their self-serving desires for impression management, emotion regulation, information acquisition, social bonding, and persuasion.

The second aspect is related to the characteristics of certain groups of individuals who are influential in viral propagation. These influential individuals are traditionally conceived as opinion leaders and are considered to exert the most influence during the evaluation stage of adoption (Rogers, 1962). Scholars have since developed several nuances of these influential individuals. One leading prototype, for example, is market mavens who possess information about many things and frequently initiate discussions with and respond to requests for information from other consumers (Feick and Price, 1987). The influential role of selected individuals in viral propagation, however, does not necessarily depend on their knowledge or expertise; it can also be derived from their propensity to engage with other consumers (Goldenberg *et al.*, 2009). Through psychological profiling of 656 social media consumers, Yeo (2012) illustrated that relationally-oriented consumers (who are more likely to propagate an interactive service through their engagement with other consumers) possess distinct consumption goals and personality profiles from traditional innovators (who are more active media users and tend to be early adopters). Taking the concept of opinion leadership further, Gladwell (2000) argues that there is not one group of opinion leaders but three sets of individuals that enable viral propagation: those who provide the message (Mavens), those who spread the message (Connectors), and those who persuade others to act on the message (Salesmen). However, Watts and Dodds (2007) downplay the role of opinion leaders in viral propagation, arguing that large cascades of influence are driven not by influentials but by a critical mass of easily influenced individuals.

The third aspect relates to the dynamics of social network where the information is shared. Two concepts from this area of research are particularly useful for our understanding of viral propagation beyond a small group of individuals—strength of ties and tipping point (or threshold). The strength of social ties among individuals refers to the combination of frequency of contact, emotional intensity, intimacy, and reciprocity between individuals (Granovetter, 1973). Diffusion researchers have observed that although strong social ties are more likely to be influential in consumers' decision and behaviors, weak ties play an important

bridging function in allowing information to travel across distinct subgroups in the social system (Brown and Reingen, 1987; Rogers, 1995). For the viral propagation of a message to be sustainable, the average number of persons introduced to the message by each person has to exceed 1—the epidemic tipping point. Once the number of people passing on the message reaches a certain critical mass (which is context-dependent), the bandwagon effect sets in and there is an increased tendency for people to spread the message simply because others have already done so (Granovetter, 1978). Applying these concepts to seeding viral marketing campaigns (Hinz *et al*., 2011), researchers have been concerned with the problem of influence maximization (i.e., finding best spreaders within a social network; Chen, Wang and Yang, 2009) and the role of cascade capacity (i.e., "largest threshold at which any small set of initial adopters can cause a complete cascade"; Chesney, 2017, p. 54).

Algorithmic Viral Propagation

The dynamics of media production, distribution, and consumption have changed significantly with the popularity and widespread use of digital technologies in recent decades. While media convergence, digitization, and improved communication capacities (van Dijk, 2012) have enabled the explosive growth of consumer-generated content and peer-distribution channels (Jenkins, 2006), they have also contributed to increasing uncertainty and a multiplicity of choices for consumers. Accompanying this development, scholars heralded the rise of new forms of consumer participation and collaboration that harness the collective intelligence of participants (Jenkins, 2006), representing "nonmarket, peer-produced alternative sources of filtration and accreditation in place of the market-based alternatives" (Benkler, 2016, p. 8). As Benkler (2016) explains, in a nonmarket information environment, consumer contributions that are seen as significant would, after initial vetting from local clusters-communities of interest, increasingly make their way to more visible sites where they obtain widespread attention through peer-recommendations. This account, however, belies the consequential roles of algorithmically driven artificial intelligence—most notably, social bots (Ferrara *et al*., 2016) and recommender systems (O'Callaghan *et al*., 2015)—in the viral propagation process which often escape awareness and accountability.

The algorithmic perspective of viral propagation attends to the ways algorithmic structures and artificial intelligence shape media production, distribution, and consumption vis-à-vis consumer preferences, activities, and expressions in digital platforms. At the core of this perspective is the concept of algorithmic culture, which refers to "the use of computational processes to sort, classify, and hierarchize people, places, objects, and ideas, and also the habits of thought, conduct, and expression that arise in relationship to those processes" (Hallinan and Striphas, 2016). Proponents of algorithmic culture highlight the reality that culture is increasingly explained by and responsive to the invisible, powerful, and pervasive work of algorithms (Striphas, 2015). For instance, digital media platforms like Facebook, Google, Netflix, and Amazon present their algorithmically generated content feeds and recommendations as direct expressions of the popularity among their users. Although viral propagation in digital contexts have enabled consumer-generated content to receive wide attention without having to satisfy traditional media or cultural gatekeepers, scholars and commentators have expressed concerns that technology giants and their proprietary recommender systems have taken over as the new gatekeepers (Hallinan and Striphas, 2016; Slack and Hristova, 2020).

Rather than focusing on the mathematical processes of algorithms, analyses of algorithmic culture emphasize the integration of algorithms in practices, policies, politics,

economics, and everyday life with consequential sociopolitical, ethical, and cultural ramifications (Striphas, 2015). It is important to note that algorithmic culture describes a dynamic relationship between machines and humans which involves machines learning to make decisions about human culture and humans learning to address those machines (Hallinan and Striphas, 2016). A case in point is the growing body of research on the spread of fake news and misinformation in digital contexts, which foregrounds the debates over the culpability of humans versus machines for their rise through the viral propagation process. On the one hand, research has highlighted the potential distortive effects of social bots—software robot devices that uses artificial intelligence and machine learning to impersonate humans and socialize with humans on social network platforms (Assenmacher *et al*., 2020)—"to infiltrate political discourse, manipulate the stock market, steal personal information and spread misinformation" (Ferrara *et al*., 2016, p. 95). Through a big data analysis of 29 million tweets, Liu (2019) demonstrate that social bots significantly distort brand-related information across the seven industries and among 24 brands under study. More specifically, these Twitter social bots were found to be effective at spreading word of mouth—as evident by human users' shares and replies—by using volumes and emotions as strategies to influence and manipulate the virality of negative misinformation about brands. On the other hand, Vosoughi, Roy and Aral (2018) found that social robots accelerated the spread of true and false news at the same rate. Given the finding that false information diffused significantly farther, faster, deeper, and more broadly than true information, the study suggests that misinformation is more likely to go viral because humans rather than machines are more likely to spread it. A similar debate also arises over the role of algorithm-driven recommender systems in amplifying the virality of disinformation and conspiracy theories in what is termed the "rabbit hole" effect of media sharing platforms such as YouTube, where people look at post after post, video after video (O'Callaghan *et al*., 2015). Drawing on algorithmic culture, one would argue that artificial intelligence has been learning and unleashing people's worst impulses while content creators and consumers adjust their patterns of media production and consumption in response to machine learning.

Viral Propagation in the Digital Age: Promises and Pitfalls

When this chapter was written for the first edition of this book, viral propagation in digital contexts was an emergent phenomenon that had recently commanded public attention following the rise to popularity of YouTube and user-generated content at that time (Yeo, 2016; Burgess and Green, 2018). Since then, viral propagation in digital contexts has substantially expanded in its application, scope, and impact. For instance, the inadvertent viral propagation of the amyotrophic lateral sclerosis (ALS) ice bucket challenge raised US$220 million for charitable causes worldwide and generated more than 2.4 million tagged videos on Facebook. More recently, viral propagation has been associated with the gamification of financial markets, as exemplified by the rise of cryptocurrency Dogecoin—based on the popular "doge" meme—and the frenzy over "viral stocks" such as GameStop which has rattled Wall Street.

We have further witnessed the mobilizing function of viral propagation in social movements from #UmbrellaMovement to #BlackLivesMatter where it has helped to garner public attention and galvanize action (Mina, 2019). Scholars have also highlighted the role of memes as a visual and creative tool of digital activism, representing a particularly valuable vehicle for political and social critique in digital contexts that are subjected to state censorship and propaganda (Mina, 2014). However, memes can be harnessed by both sides of the political divide, including state-sponsored actors for political suppression. For instance,

memes can be easily designed as created *kompromat* (i.e., fabricated compromising material concerning a dissent or opposition figure) and distributed through viral propagation (Pearce, 2015). Meanwhile, social media users are becoming ambivalent and cautious about the sharing of user-generated content as they come to realize the potential pitfalls of digital participatory culture in the face of an increasingly polarized media ecology and society (Chu and Yeo, 2020).

As viral propagation gained the reputation as the gold standard of digital marketing, shares as an indicator of viral engagement became the determining metric of a successful earned media campaign. Practitioners and researchers, however, have increasingly questioned the wisdom of a relentless pursuit of viral engagement or shares. Doubts were raised about the effectiveness of viral advertising after one of the most highly shared ads of all time—Evian's "Roller Babies"—had little impact on sales despite garnering over 55 million views (O'Leary, 2010). In fact, research indicates that ad persuasiveness decreases by 10% for every million views received by a video ad (Tucker, 2015). It appears that factors contributing to viral success may actually be bad for the brand. Framing the problem as a task of creating advertising creatives that can positively influence both shareability and brand-related outcomes, Akpinar and Berger (2017) demonstrate that emotional integral ads increase sharing while also benefiting the brand. Other scholars, however, point to more fundamental problems with viral marketing that go beyond creative solutions to generating "valuable virality." Miles (2014) highlights the inherent tension that exists between presenting marketer-generated viral messages as independent, quasi-organic entities with "wild" potentials and the ostensibly contradictory assertion that they can also be "domesticated" through strategic management of their design parameters and infection vectors. He further criticizes the contagion-based rhetorical strategies of viral marketing as one that advocates turning away from customer interaction. Using a case study of a viral tourism campaign, Blichfeldt and Smed (2015) contend that the "uncontrollability" of viral propagation creates unforeseeable associations and divergent meanings in the diverse set of discourses that are constructed and shared as the marketer-generated message goes viral—in their case changing from "do it for Denmark" to "do it to Denmark."

Conclusion

Although viral propagation has been an age-old phenomenon, its digital manifestation represents a fundamental shift in the way ideas, meanings, and information flow as explicated in this chapter. Celebratory and utopian views of the dynamics of this shift as espoused by the likes of Benkler (2006) and Jenkins (2006) in earlier years have since been tempered with concerns about the ramifications of viral propagation, especially in relation to the unchecked proliferation of fake news, misinformation, and conspiracy theories in digital contexts. Despite increasing research attention on the spread of such content, there remains a paucity of consumer research into the viral propagation of consumer- or bot-generated messages that perpetuate radically alternative interpretations of events. Much consumer and marketing research on viral propagation has hitherto been concerned with how to encourage the spread of certain content rather than how to discourage the spread of certain content. As a result, there has been little effort in understanding consumers' motivations for spreading misinformation or disinformation about certain brands, products, or services. More generally, we have become better equipped to explain virally propagated phenomena in digital contexts but there remain gaps in our knowledge concerning the psychosocial consequences for individual consumers. In this regard, the four models of viral propagation outlined in this

chapter provide a comprehensive set of conceptual tools and highlight the important points of departure for further research and theoretical advancement. While consumer research has begun to examine the attitudinal effects of viral propagation on the brand (e.g., Akpinar and Berger, 2017), these effects constitute a limited range of the possible "effects of messages on the cognitions (knowledge or beliefs), emotions, attitudes, and behavior of the message creators/senders themselves" (Valkenburg, 2017, p. 478). Addressing these "self-effects" of viral propagation would be a potentially fruitful direction for future studies.

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