Consumer Herding Behavior in Online Buying: A Literature Review

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Abstract

The purpose of this review paper is to present the application of herding behavior in online buying. The simplest description of herding behavior is the imitation of others in making decisions. Online buying platforms have facilitated observing others' buying behavior, thereby increasing possibilities of social influence on our information search, evaluation, and buying. The concept of herding is multi-disciplinary; however, the literature review on herding behavior is mainly grounded in economics and finance. There is little understanding of herding behavior in marketing literature. Therefore, this study covers herding behavior literature through high-quality research papers published from 2000 to 2020 in journals indexed in the social science citation index, science citation index expanded, and emerging source citation index. This paper discusses the conceptualization of herding in online buying, herding situations, information-processing view of herding, measuring herding effect, herding models and theories, and areas for future research to enrich herding literature in online buying. This paper proposes a herding model (HCMMD) based on the stimulus-organism-response (SOR) theory to study herding behavior.

Keywords: *Consumer Herding Behavior, Herding Literature Review, Herding Models, Online Buying, Stimulus-Organism-Response (SOR) Theory.*

Introduction

With the internet becoming an essential part of our life, our buying pattern has transformed. Now we order our favorite food online, buy movie tickets online, purchase tailor-made clothing online, and the list goes on. Online buying has made our life easier and convenient (Rita, Oliveira, & Farisa, 2019). Virtual buying platforms have provided new ways of obtaining information in making purchase decisions (Kim, Lee, & Jung, 2020). Despite these changes, what has not changed is our tendency to get influenced by others. Infect, we are more likely to be influenced by others in an online environment which facilitates observation of others' buying behavior (Ding & Li, 2018).

People are inclined to follow the majority (Zhao, Stylianou, & Zheng, 2018). A box-office hit movie attracts more people (Xu & Fu, 2014); a software downloaded by many gets more downloads (Zhao, Tian, & Xue, 2020); a best-selling book continues to be a top seller (Chen, 2008), and a highly cited paper tends

to get more citations (Quaschning, Pandelaere, & Vermeir, 2012). A famous philosopher Eric Hoffer said that when people are free to do whatever they want, they imitate others, a phenomenon known as herding behavior (Bikhchandani, Hirshleifer, & Welch, 1998, p.152).

Herding behavior has been studied to investigate herding tendency in choosing where to invest (Spyrou, 2013), selecting products available on the auction (Dholakia, Basuroy, & Soltysinski, 2002), opting for software (Hanson & Putler, 1996) and music to download (Salganik & Watts, 2008), adopting technology (Walden & Browne, 2009), and making product (Chen & Wang, 2010) and service choices (Ameri, Honka, & Xie, 2019).

Herding behavior exists in social science, cognitive science, economics, finance, and many other fields, but the literature is mainly grounded in economics and finance. There is little understanding of herding conceptualization and its phenomenon in marketing (Langley, Hoeve, Ortt, Pals, & Vecht, 2014) in general and online buying in particular.

Research Objective

Considering the research gap, the objectives of this research are:

(1) To contribute to understanding herding behavior, its process, and potential influencers over herding behavior in online buying.
(2) To propose a model to measure herding behavior in online buying.

Research Questions

This research study aims to answer the following research questions**:**

(1) What is the conceptualization of herding behavior in online buying?
(2) Under what situations is herding behavior likely to take place?
(3) Is herding behavior rational or irrational?
(4) Which theories have been used in earlier herding studies?
(5) How could herding behavior be measured?
(6) What are the avenues for future research in online herding behavior?

Methodology

This review covers herding literature related to online buying for the last 20 years (2000-2020). The research papers were searched on Google Scholar and EBSCOhost using keywords such as herding, bandwagon, popularity cues, the crowd's wisdom, and online buying. To ensure the review's quality, only those research papers were selected which were published in journals indexed in the social sciences citation index, science citation index expanded, and emerging source citation index. The number of papers downloaded for initial screening was 500. Majority of the papers covering herding were from finance and economics and focused on investment behavior. The number of relevant research papers shortlisted was 62.

Literature Review

Herding Behavior Conceptualization

Herding has been described as a process (Langley et al., 2014; Raafat, Chater, & Frith, 2009), a situation (Sun, 2013; Zhang, Kem, Cheung, & Lee, 2014), and an outcome of a situation (Liu, Huang, & Zhang, 2016). Bikhchandani et al. (1998) define herding as "Convergence on similar behavior." (p.993). Raafat et

al. (2009) explain herding as a process: "the alignment of thoughts or behaviors of individuals in a group through local interaction and without centralized coordination."(p.420). Following a similar pattern, Langley et al. (2014) define herding as "the group process through which a population of consumers develops whereby behavior becomes unified, the number of people expressing the behavior grows, and changes spread rapidly through the herd."(p.18). Banerjee (1992) defines herding as a situation "where everyone does what everyone else is doing even if their private information suggests something different (p.798) known as information cascade." (see table 1 for herding definitions)

Herd behavior and information cascade are often used interchangeably (Liu et. al, 2016). An information cascade emerges in an information asymmetry situation where consumers find it optimal to follow others after observing their actions, even if it is against their private information (Bikhchandani et al., 1998). Herding could be an outcome of such a situation. In the marketing context, information cascade comes into being when the popularity of a product against its competing brands leads to herd behavior (Li & Wu, 2018).

Information cascade may encourage herd behavior, but the herd is not necessarily formed only due to information cascade (Xuexin, 2015). One may conclude that information cascade implies herd behavior, but herd behavior does not necessarily mean information cascade (Çelen & Kariv, 2004). There may be other reasons for herd formation (Spyrou, 2013). In online buying, customers are exposed to user ratings and product reviews of other buyers. Therefore, herding definition is being adapted here from Chen (2008) and Rook (2016), as follows: "purchase intention, or purchase behavior resulting from exposure to the evaluations or purchase behavior of the crowd is classified as herd behavior."

Information Processing View of Herding

The information processing view of herding highlights that when people rely on just heuristics (mental-shortcuts) instead of detailed product information, they tend to herd. Consumers usually gather information from different sources such as company websites, product reviews, consumer ratings, family and friends (Chen, Wu, & Yoon, 2004). They collect information to acquire knowledge and reduce uncertainty (Berger & Calabrese, 2006).

As per cognitive resource theory, every human action utilizes some mental resources (Hoffman & Novak, 1996). In online shopping, consumers have to allocate cognitive resources across different phases of the decision-making process. Therefore, there is a tendency amongst consumers to reduce their mental effort in information processing while shopping (Zheng, Zhu, & Wang, 2016).

According to the Elaboration Likelihood Model, consumers either take the central or peripheral route in processing information (Petty & Cacioppo, 1986). The central route utilizes different sources of information at a deeper level, while the peripheral route leads to the use of heuristics in decision making. Heuristics are rules of thumb that consume less cognitive resources (Yu & Chen, 2018).

The choice of information route depends on motivation and the decision-maker's ability (Petty, Cacioppo, & Schumann, 1983). If either of the two is at a low level, consumers would prefer the peripheral route to persuasion. In online shopping, knowledgeable consumers are likely to go through online reviews, while people with less product knowledge may base their decision on the number of reviews (Park & Kim, 2008).

Likewise, product sales is generally associated with product quality (Zheng et al., 2016). The number of products sold, as a heuristic, could reflect a product's popularity and may lead to information cascade (Bikhchandani et al., 1998). Bonabeau (2004) explains, "What others do matters more to us than facts."

Table 1: Conceptualization of Herding

S.No	Authors	Herding Conceptualization
1	Asch (1956)	"Herd behavior describes various social situations in which individuals are strongly influenced by the decisions of others"
2	Banerjee (1992)	"Everyone does what everyone else is doing"
3	(Devenow & Welch, 1996)	"Rational herding is information-based such that rational agents with similar product preferences adopt the same response to similar information about the product characteristics"
4	Bikhchandani et al., (1998)	"Convergence of similar behavior"
5	(Rook, 2006)	"Herd behavior refers to the phenomenon of people following a crowd for a given period"
6	Chen (2008)	"Herd behavior can be described as a change in consumer product evaluations, purchase intentions, or purchase behavior resulting from exposure to the evaluations, intentions, or purchase behaviors of referent others"
7	Raafat et al. (2009)	"Herding is a form of convergent social behavior that can be broadly defined as the alignment of the thoughts or behaviors of individuals in a group (herd) through local interaction and without centralized coordination"
8	Adapted from Chen (2008) and Rook (2006) in this study	"Purchase intention or purchase behavior resulting from exposure to the evaluations or purchase behavior of the crowd is classified as herd behavior"

Herding Situations

Uncertainty and Herding

In physical retail stores, consumers have the liberty of evaluating products through touch-and-feel. As a result of no physical evaluation in online retail stores, consumers encounter information asymmetry which leads to uncertainty in online shopping (Dimoka & Pavlou, 2008). Hu, Liu, and Zhang (2008) define uncertainty as "the difference between the actual product and what it appears online". Product uncertainty can be defined as "buyer's difficulty in evaluating the product (description uncertainty) and predicting how it will perform in the future (performance uncertainty)" (Dimoka, Hong, & Pavlou, 2012). The descriptive uncertainty emanates from the seller's inability to communicate product features, while performance uncertainty emerges from the buyer's inability to predict product performance (Liebeskind & Rumelt, 1989).

Consumers go through product reviews to enhance their product knowledge. When positive or negative reviews are in majority, they reduce the uncertainty attached to buying a product, while mixed reviews increase uncertainty (Hu et.al, 2008). According to the Uncertainty Reduction Theory, when potential buyers encounter uncertainty due to insufficient product knowledge, they tend to follow risk-minimizing efforts to reduce uncertainty (Berger & Calabrese, 1974). Consequently, they rely on the opinions of others (Komalasari, 2017).

Perceived Risk

When the perceived risk attached to buying something is high, consumers tend to converge around a consensus opinion. As the fear of wrong decisions rises, dependence on others' decisions increases. A strong sales history or high ranking reduces perceived risk (Chen, & Wang, 2010; Das, Mukherjee, & Smith, 2018), thereby convincing a novice consumer to join the herd.

Product Knowledge and Prior Experience

Prior product knowledge is an important variable to determine a consumer's tendency to join the herd. Consumers with in-depth knowledge are likely to trust their knowledge instead of relying on others (Luo, Robert, Xu, Warkentin, & Ling, 2015; Xuexin, 2015). Consumers lacking technical knowledge may rely on cues of product quality to judge a product.

Similarly, consumers having high private signals, by virtue of personal experience, are less likely to herd (Bikhchandani et al., 1998). The reliance on extrinsic cues is moderated by personal experience (Veale, Quester, & Karunaratna, 2006). Previous experience and herding have a negative relationship, both in financial decision making (Menkhoff, Schmidt, & Brozynski , 2006) as well as in online shopping (Li, Meng, Jeong, & Zhang, 2020)

Consumer Involvement

Consumers' involvement in Products depends on their importance in the life of consumers (Traylor, 1981) and consumers' needs and interests (Zaichkowsky, 1985). Consumer involvement is neither completely based on the products nor on consumers but rather is an outcome of the interplay between consumers and products in a given situation (Antil, 1984). According to Zaichkowsky (1985), involvement has three antecedents: the person's characteristics, the stimulus, and the situation. When consumers encounter information overload, they use others' purchase data as heuristics (Simpson, Siguaw, & Cadogan, 2008). As consumers' involvement increases, consumers' appetite for getting information increases (Ali, 2016) and, as a result, the use of heuristics reduces (Cheung, Xiao, & Liu, 2012). It can be concluded that consumers under low involvement are more likely to follow herding cues such as customer rating and historic sales compared to high involvement situations.

Herding: Rational or Irrational

The group influence where one is doing what everyone else is doing reflects a lack of rationality (Baddeley, Burke, Schultz, & Tobler, 2010). The irrational view of herding posits an instinctive stance reflected in mobs and riots, where people follow others without much of a conscious effort (Bon, 1908; Tarde, 1903). An individual is de-individualized once he/she becomes a member of a crowd (Bon, 1908).

However, Bayesian models assume rational herding behavior (Banerjee, 1992). It means that people who herd use social learning information objectively in their tendency to herd (Bikhchandani, Hirshleifer, & Welch, 1992). In majority of the herding studies conducted within the finance and economics discipline there is evidence of both rational (Zhang & Liu, 2012) and irrational herding behavior (Kumar & Goyal, 2015). Buying a company's shares based on high traded volume instead of the financial fundamentals is attributed to irrational herding (Zhang & Chen, 2017). A combination of rational and irrational herding behavior is observed when a person considers buying a stock based on its fundamental merit but purchases it after many others have bought it (Devenow & Welch, 1996). We may call it semi-rational herding behavior.

There are few studies in consumer behavior literature that attempt to uncover whether consumers herd rationally or irrationally. Ding & Li (2018) investigated herding phenomenon in the buying and consumption of digital content. Their findings indicated rational herding because buyers considered product characteristics in making their decision. Wang, Guo, and Sun (2019) observed rational herding in selecting online courses. Students who considered the number of students registered in courses and the content of courses, along with teachers' characteristics, while selecting online courses indulged in rational herding. In contrast, those who solely relied on the number of registered students in courses displayed irrational herding behavior.

The rational herding model ignores psychological and sociological factors in decision making (Baddeley, Pillas, Christopoulos, Schultz, & Tobler, 2007). In a way, consumers are assumed to be homogeneous, who would process information similarly (Walden & Browne, 2009). Baddeley et al. (2010) believe that herding is neither entirely rational nor mere instinctive; instead, it is an interplay of both. Likewise, proponents of integrated approaches to herding behavior (Baddeley, et.al 2010; Gigerenzer & Goldstein, 1996; Raafat et al., 2009) consider a dichotomous view of herding as rational or irrational to be too limited to capture the complexity of herding phenomenon. It suggests some psychological and social influences on the tendency to herd (Baddeley, 2010, 2013).

Social Influences

There are two main types of social influences: normative social influence and informative social influence. Normative social influence is exhibited by conforming to others' expectations, while informative social influence is reflected in accepting information from others as evidence of reality (Deutsch & Gerard, 1955). Normative influence may affect informative social influence. The pressure of being part of a group may push group members to adjust their responses to make the group-approved decision (Rook, 2006). Information coming from group judgment may be considered more credible. So, to make the right decision, an individual may accept information from others.

Normative social influence does not necessarily operate in isolation from informative social influence (Morton & Harold, 1995). In a famous experiment by Asch (1956), subjects were asked to compare the drawn lines' length and select the bigger of the two lines. To investigate group influence, fake confederates sided with the wrong choice. Most of the participants conformed to the majority opinion and made wrong choices. Later these subjects confessed that other group members influenced them and, therefore, they changed their correct choices. Although it was an unambiguous and straightforward task, participants in the experiment, while trying to conform to group members (normative social influence), made a judgmental mistake. They assumed that other group members were better informed, so they updated their views (informative social influence). In the context of online environment, observing the actions of others is likely to result in an information cascade where a buyer may discount his/her information and follow others (Ding & Li, 2018)

Theories for Measuring Herding Behavior

Information Cascade Theory

The most prominent theory employed in learning the herding process is the information cascade theory. Under this theory, after having observed the predecessors' actions, consumers find it optimal to follow them while disregarding their own previously stored information (Bikhchandani et al., 1992). This theory assumes sequential decision making and visibility of buying decisions. Initial buyers tend to rely on their knowledge. If many individuals make a similar decision, then the product becomes popular, and an information cascade tends to form (Liu et al., 2016). Other individuals, feeling the uncertainty of a buying decision and lacking product knowledge, are inclined to follow earlier buyers, and a herd starts to form (Welch, 1992). This information cascade can be reversed if new contrary information becomes public, which means that a herd can be fragile (Walden & Browne, 2009).

Lee, Hosanagar and Tan (2015) examined the herding effect by drawing a relationship between an on-going movie and its future ratings. Results indicated that higher ratings caused an increase in future ratings. Ha et al. (2016) examined the herding effect in restaurant selection using consumer ratings and crowdedness for dine-in and take-out restaurants. Higher user ratings influenced the choice irrespective of the type of restaurant.

Social Impact Theory (SIT)

The social impact theory, proposed by Latané (1981), reflects changes at individual level in response to others' real or perceived actions (Latane & Wolf, 1981). The theory states, "When other people are the source of impact, and the individual is the target, the impact should be a multiplicative function of the strength, immediacy and number of other people" (Latané, 1981, p.344)). Strength means "salience, power or intensity of given source to the target – usually this would be determined by such things as source's status, age, socio-economic status" (Latané, 1981). Immediacy means “closeness in space or time and absence of intervening barriers and filters” (Latané, 1981). It is the psychological distance between communicator and recipient (Wiener & Mehrabian, 1968). The source's number is a numerical value (Latané, 1981).

The study of Mir and Zaheer (2012) showed that the number of users increased the perceived credibility of user-generated content, consequently enhancing products' purchase intention. Handarkho (2020) used SIT to investigate the impact of social experience on the willingness to shop online. Handarkho (2020), in his study, considered subjective norms and peer communication as *source strength*, emotional support and parasocial interaction as *immediacy* and influencing group size as the *number*. Xue (2019) used SIT to examine the role of social information (herding cues) in carving attitude toward Facebook advertising. He considered tie strength between friends as *source strength*, physical distance with friends as *immediacy* and number of friends as the *number* of the influencing group.

Signaling Theory

There is a case of information asymmetry in the online environment because buyers cannot physically assess the product. This information asymmetry leads to risk and uncertainty. Therefore, product and seller quality signals are communicated through websites (Cypryjański & Grzesiuk, 2015). Signaling theory provides a framework to employ extrinsic cues to convey product quality to consumers (Wells, Valacich, & Hess, 2011).

Using signaling theory, Cypryjański and Grzesiuk (2015) investigated the impact of the number of bids on sales in the hypothetical auction market. He and Oppewal (2017) found the effect of popularity and scarcity cues on luxury product choice. Yu, Hudders and Cauberghe (2018) demonstrated the impact of popularity cues on perceived quality and brand attitude.

Measuring Herding Behavior

Herding behavior has been measured either through the imitation scale (Sun, 2013) or through outcome variables such as purchase intention (Gellerstedt & Arvemo, 2019), sales (Lee, Lee, & Oh, 2015), attitude toward the brand (Yu et al., 2018) etc. The dominant methodological approach has been experimental. Studies involving experiments (Waddell & Sundar, 2020; Xue, 2019) have measured herding effect by comparing means of outcome variables in experimental and control groups. Some studies (Li & Wu, 2018; Sunder, Kim, & Yorkston, 2019) have also measured herding behavior with the help of regression equations by using real data from websites.

Herding Models

Arguably, the most influential herding model was the Bayesian model proposed by Banerjee (1992). It is a probabilistic model of decision making based on the Bayesian decision theorem in which the probability of one event is based on the happening of another event. Banerjee (1992) portrayed a scenario where a customer could buy out of two choices. Assuming that choices are Y and Z, the probability of choosing any of the two options is the same (1/2=0.50). There is no information available to the first buyer for social learning, so he/she has to depend on his/her knowledge or private signal. For some reason, he buys Y. The

following person in the row can now observe the choice of the first customer. Under uncertainty and low product knowledge, the probability of preferring Y increases. The second customer will update his/her belief regarding product choices, having observed the first customer's selection. Likewise, subsequent customers in this sequential decision-making will make choices in the presence of publically available information from previous buyers. Y and Z may provide the same quality, but consumers' preference for Y may be more than Z.

Majority of herding studies in online buying (Egebark & Ekström, 2018; Fishman, Fishman, & Gneezy, 2019) have observed the direct impact of herding cues on consumer behavior. There are few studies (Ding & Li, 2018; Jeong & Kwon, 2012) that have used mediators and moderators. To understand the herding phenomenon, we need to have comprehensive models to learn how and when herding stimuli influence online buying behavior. Therefore, we are proposing a stimulus-organism-response (SOR) model to understand the herding process.

The SOR model was presented by Mehrabian and Russell (1974) and has been widely used in environmental psychology. In the model, stimuli represent input, organism represents the process, and response the output (Kim et al., 2020). Stimuli could be offline (Hussain & Ali, 2015) or online atmospheric variables having the potential to influence our internal state (organism) to produce an outcome (Floh & Madlberger, 2013). Environmental stimuli are often extrinsic cues rather than intrinsic (Bagozzi, 1986). SOR model has been used in a variety of contexts, such as impulse buying (Changa, Eckmanb, & Yanb, 2011), electronic word of mouth (Bigne, Chatzipanagiotou, & Ruiz, 2020), online learning (Zhai, Wang, & Ghani, 2020), virtual reality (Kim et al., 2020) and online hotel booking (Emir, Halim, Hedre, Abdullah, Azila, & Azmi, 2016). To understand herding behavior, we are proposing the following HCMMD model based on herding literature.

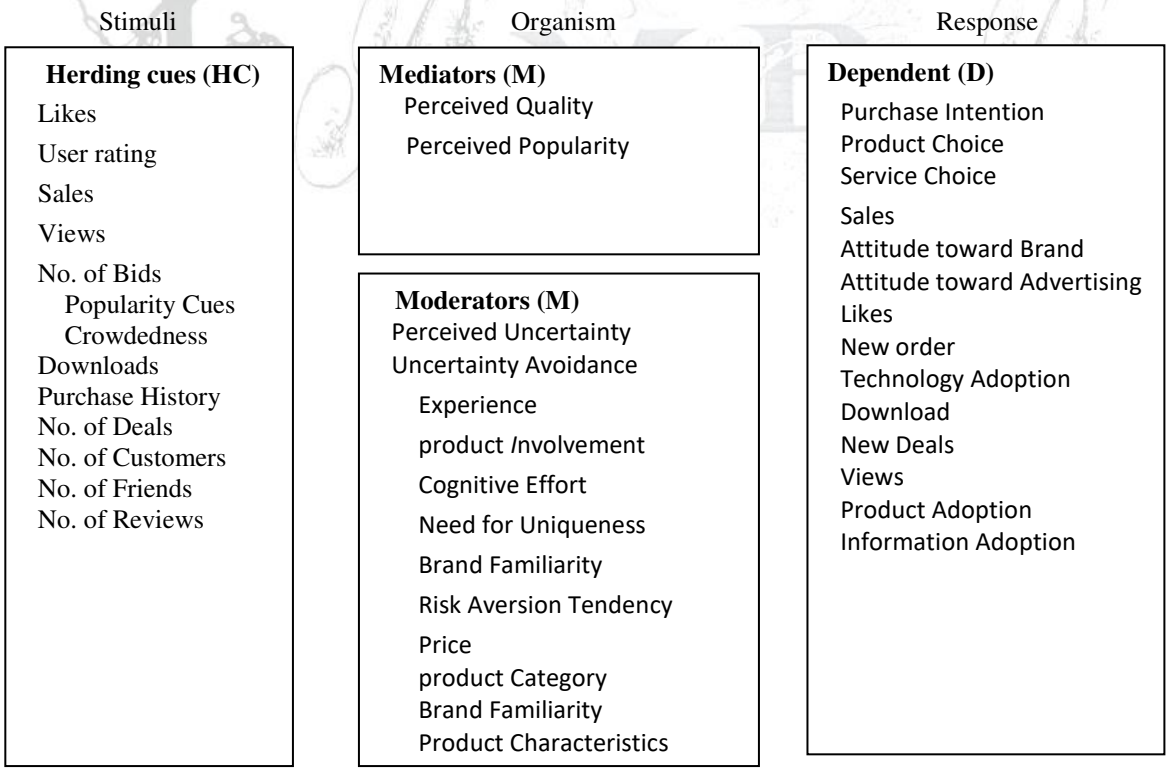

Figure 1: HCMMD proposed herding model

The sources of HCMMD model are mentioned in Table 2

Table 2: Herding model source detail

Variable	Description	Source
Independent	Likes	(Ye, Cheng, & Fang, 2013),(Egebark & Ekström, 2018)
Independent	User Rating	(Ha et al., 2016),(Li et. al., 2020),(Gellerstedt & Arvemo, 2019),(Liu et al., 2016)
Independent	Sales	(Lee et al., 2015),(Li & Wu, 2018), (Tucker & Zhang, 2011)
Independent	Views	(Fu & Sim, 2011),(Fu, 2012)
Independent	No. of Bids	(Dholakia et al., 2002)
Independent	Popularity Cues	(Jeong & Kwon, 2012)
Independent	Crowdedness	(Ha et al., 2016)
Independent	Downloads	(Salganik & Watts, 2008),(Zhao et al., 2020)
Independent	Purchase History	(Ye et al., 2013)
Independent	No. of Deals	(Liu & Sutanto, 2012)
Independent	No. of Customers	(Fishman et al., 2019), (Wang et al., 2019)
Independent	No. of Friends	(Xue, 2019)
Independent	No. of Reviews	(Kim & Gambino, 2016)
Mediating	Perceived Quality	(Yu et al., 2018)
Mediating	Perceived Popularity	(Yu et al., 2018),(Wu & Lee, 2016)
Moderating	Perceived Uncertainty	(Lee et al., 2015)
Moderating	Uncertainty Avoidance	(Yu et al., 2018)
Moderating	Experience	(Sunder et al., 2019),(Liu, Feng, & Liao, 2017)
Moderating	Product Involvement	(Chen & Wang, 2010)
Moderating	Cognitive Effort	(Li et al., 2020)
Moderating	Need for Uniqueness	(Yu et al., 2018)
Moderating	Brand Familiarity	(He & Oppewal, 2017)
Moderating	Risk Aversion Tendency	(Jeong & Kwon, 2012)
Moderating	Price	(Wu & Lee, 2016)
Moderating	Product Category	(Hu, Wang, Chen, & Hui, 2020)
Moderating	Brand Familiarity	(He & Oppewal, 2017)
Moderating	Product Characteristics	(Ding & Li, 2018)
Dependent	Purchase Intention	(Chen et al., 2010), (Wang & Yu, 2017)
Dependent	Product Choice	(He & Oppewal, 2017),(Chen, 2008)
Dependent	Service Choice	(Fishman et al., 2019),(Wang et al., 2019)
Dependent	Sales	(Cypryjański & Grzesiuk, 2015),(Chen, Wang, & Xie, 2011), (Ye et al., 2013), (Liu et al., 2017)
Dependent	Attitude toward Brand	(Yu et al., 2018)
Dependent	Attitude toward Advertising	(Xue, 2019)
Dependent	Likes	(Godinho De Matos, Ferreira, Smith, & Telang, 2016)
Dependent	New order	(Liu & Sutanto, 2012)
Dependent	Technology Adoption	(Sun, 2013), (Xue, 2019)
Dependent	Download	(Salganik & Watts, 2008)
Dependent	New Deals	(Liu & Sutanto, 2012)
Dependent	Views	(Fu & Sim, 2011),(Fu, 2012)
Dependent	Product Adoption	(Ameri et al., 2019)
Dependent	Information Adoption	(Shen, Zhang, & Zhao, 2016)

Future Research

When consumers follow others due to low motivation for information gathering, it points to a herding tendency in low-involvement products. However, It is generally believed that herding takes place under information asymmetry (Komalasari, 2017) conditions leading to high perceived uncertainty and high risk, which often coincide with high involvement products. Earlier herding studies (Chen et al., 2010; Chen, 2008; Liu & Sutanto, 2012; He & Oppewal, 2017) involving low involvement products and high involvement products (Chen et al., 2010; Dholakia, Basuroy, & Soltysinski, 2002; Lee et al., 2015) have been inconclusive about whether people herd due to low motivation for information gathering or herd under high uncertainty and low product knowledge. Therefore, the herding phenomenon should be further investigated in high and low involvement products to understand underlying factors facilitating herding behavior.

Herding studies have mainly ignored the effect of price (Liu et al., 2016) in influencing the perceived quality of products and purchase intention. The correlation between price and quality is well-established in marketing literature (Gu, Kannan, & Ma, 2018). High Price items increase financial risk (Jacoby & Kaplan, 1972) and enhance consumer involvement in the buying process (Dholakia, 2001). Consumers experiencing a lack of product knowledge and uncertainty are likely to herd (Komalasari, 2017). Price was either overlooked (Liu et al., 2016) or controlled (Wang, 2019) in earlier herding studies. We suggest that the pricing dimension should be incorporated into herding models.

There is a paucity of research on understanding consumers' characteristics that result in herding behavior (Kumar & Goyal, 2015). The focus of pattern-based herding research studies has been on heuristics (Raafat et al., 2009). There has been work on the macro-level of the decision-making process, but the micro-level decision context remains un-explored (Fiol & O'Connor, 2003). Therefore, there is clear neglect of individuals' unique characteristics and emotional aspects (Merli & Roger, 2013). The study of Baddeley (2010) which shows that impulsivity is positively associated with the tendency to herd suggests that consumers' certain unique characteristics influence herding behavior. Therefore, research studies should be conducted to find the role of personality traits (Dania & Ali, 2018) and impulse buying tendency in influencing herding behavior.

Imitating others is not just a cognitive phenomenon but also biological (Singer & Fehr, 2017). Under the empathizing mechanism, our brain neurons respond in a similar pattern when we do something ourselves or when we watch others doing that same thing. Empathizing requires observation and emotional connection. Cognitive science tends to rely on individual mental characteristics to understand human behavior, but human behavior is immensely influenced by the social network an individual operates in (Pentland & Pentland, 2007). Neuroscience can help us study the linkage between external forces and our natural herding tendency. Neuromarketing is an emerging field that can help us analyze the herding phenomenon. It can help us discover the association between instinctive herding and rational herding. Under this topic, there are just two herding studies conducted using Neuromarketing. In one study by Ye et al. (2013), participants were shown the history of transactions by earlier buyers. The herding behavior was observed through eye-tracking. Purchase history was positively correlated with high sales. Participants' gaze concentrated at the purchase history area, which shows its importance in consumer information gathering. In the second study, Chen et al. (2010) observed herding behavior for buying books through Electroencephalogram (EEG). There is a need to conduct more neuromarketing studies to investigate herding evidence in the context of online buying.

Few studies have tried to distinguish between rational and irrational herding in the online buying context (Hu et al., 2020). It is suggested to conduct herding studies incorporating more variables where it could be logically inferred whether resulting herding is rational or irrational.

Conclusion

This review paper aimed at understanding herding phenomenon in online buying. Consumers are likely to imitate others when there is a high level of uncertainty, risk, and lack of product knowledge. Some consumers may also herd because of low involvement in the buying task. They may just utilize online consumer ratings or product sales statistics as heuristics to select products and/or services. In such situations, consumers may herd even in low uncertainty situations. Herding could be rational or irrational or semi-rational, depending on how consumers utilize herding cues.

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