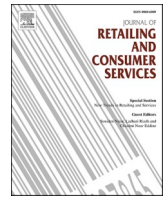




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Revisiting food delivery apps during COVID-19 pandemic? Investigating the role of emotions

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ABSTRACT

Food delivery apps (FDAs) have transformed the way consumers order and consume food, especially during the mobility limitations of the COVID-19 pandemic. The hospitality industry, especially restaurants are heavily reliant on mobile technology during the pandemic to strengthen essential online to offline food delivery, helping large number of consumers. This study investigates the role of app aesthetics in evoking emotions which predict continued usage intentions for FDAs using the theoretical lens of the pleasure arousal dominance (PAD) framework. Data was collected from 341 consumers during the pandemic. Findings indicate that app aesthetics generate pleasure, arousal, and dominance emotions among consumers during pandemic where pleasure is the most significant predictor of continued usage intentions followed by dominance. Findings also confirm the mediating effect of arousal on pleasure and pleasure on continued usage intentions. The study has implications for academicians, food delivery companies, app designers and other app-based businesses as it proves the significance of an aesthetic app design in evoking positive PAD emotions in consumers during a crisis and strengthens the explanation of continued usage intentions.

1. Introduction

Penetration of smartphones has changed lifestyles of millions of people worldwide. Due to their multiple functionalities, smartphone usage among consumers has risen exponentially. A report by the Global Association of Mobile Operators suggests that mobile phone users exceeded the 5 billion mark worldwide in 2020. More than 3.7 billion mobile phone users use the internet, and more than 12 million people have some form of internet of things connection (GSMA, 2020). Several companies have launched their mobile based applications to tap into the pool and attract customers. Food delivery apps (FDAs) are among the fastest growing sectors of mobile applications (Statista, 2020a). The online food delivery business reached US\$ 107.4 billion worldwide in 2019 and is expected to reach US\$182.3 billion by 2024 (Statista, 2020a). China, US, and India are the three largest markets for FDAs. Eleme, Meituan, Ubereats, Grubhub, Seamless, and Swiggy are some of the major global service providers in the FDA sector and have seen sharp growth in recent years. Globally the FDA sector is expected to grow at an annual growth rate of 11.4% during 2019–24 (IMARC, 2020). The Statista report says that FDAs are beneficial to organizations and customers alike as they offer easier, more efficient, and hassle-free online order

management and offline delivery.

The proliferation of FDAs has proved to be very useful during the ongoing global pandemic caused by the novel coronavirus which erupted in 2019 and has progressively expanded to every country in the world (Pan et al., 2020). According to the World Health Organization, hitherto there are 118,209,329 confirmed cases of COVID-19, including 2,623,409 deaths worldwide (WHO, 2021). Strict COVID norms like maintaining social distancing, wearing masks, and avoiding direct or indirect social contact have been imposed by governments to minimize the spread of the virus and contain the associated infections (Pan et al., 2020; Venkatesh and Edirappuli, 2020; Xie et al., 2020). Strict worldwide lockdown measures imposed during the initial months of the pandemic and continued mobility restrictions have severely affected the traditional restaurant and catering industry as consumers are not willing to dine in or use public services. The restaurant industry which was projected to reach US\$ 899 billion in 2020 in US (National Statistics, 2020) is estimated to have lost around US\$ 240 billion by the end of 2020 (Klein, 2020). According to an estimate, the year over year decline of seated diners' restaurants worldwide was a staggering 32.39% from February to September 2020 (Statista, 2020b). China and India have also faced similar losses where restaurant revenues have declined by

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45% (Zhao and Bacao, 2020) and 35% (Singh, 2020) respectively.

Amid the negative impact of pandemic on businesses (Talwar et al., 2021), large number of restaurants transitioned to online catering and transformed their operations from traditional brick and mortar store linked services to online-to-offline services to fulfill consumers' demand and to sustain the business through the crisis, thanks to FDAs. Research shows unusual consumer purchase behavior during the pandemic (Laato et al., 2020) including financial attitude (Talwar et al., 2021). Many traditional food delivery services have moved to online platforms during the pandemic and new companies have entered the FDA business during the pandemic to stay afloat or use the opportunity to transition to the digital platform (Lattani, 2020). For example, Amazon launched its food delivery business in May 2020 in India (Bhakta and Sriram, 2020). 106,000 new companies linked to food delivery services were registered in China between January to May 2020 (Tianyancha, 2020) and consequently, observed an increase in revenue by US\$ 91.8 billion in 2020 (iiMedia, 2020). FDAs not only helped catering companies or restaurants survive and grow during the COVID 19 pandemic but also satisfied consumers' demands of personal safety concerns, efficient food delivery, and convenience, (Zhao and Bacao, 2020).

The massive digital transformation that has happened in the industry also needs to be sustained in the long run. Since the FDAs are the interface between the restaurants and caterers and the consumers, it is pertinent that businesses ensure continued usage of the FDAs during and after the pandemic. Hence, investigating the motivating factors to revisit FDAs during COVID-19 pandemic is essential for multiple stakeholders. Prior studies explore multiple antecedents of adoption intentions or intentions to use FDAs such as social influence, easiness, satisfaction, quality of service, convenience, and performance expectancy (Cho et al., 2019; Ray et al., 2019; Roh and Park, 2019; Yeo et al., 2017) along with perspectives of consumption value (Kaur et al., 2021) and innovation resistance (Kaur et al., 2020). Research indicates that aesthetics (appeal and formality) and design play a crucial role in determining the behavioral intentions towards a website as they generate positive emotions of pleasure, arousal, and dominance among users (Chang et al., 2014; Loureiro et al., 2020) and drive users emotionally to visit a website (Yang et al., 2020). However, studies investigating the antecedents of continued usage intentions of FDAs are scarce. Furthermore, the current COVID-19 situation, recurring waves of COVID cases and new virus strains in countries across the world makes the study more relevant. The risk of further lockdowns, curfews, and mobility restrictions inspires us to study the factors motivating consumers to revisit the FDAs from an environmental psychology perspective. The primary research gap that this study aims to fulfill is identifying the factors that determine a consumer's continued usage intentions towards FDAs during a pandemic. The results would help businesses, especially newly launched food delivery services, understand customers' emotion and behavior towards FDAs and design more aesthetically inclined FDAs.

Specifically, our study attempts to address three research questions (RQs). First, how aesthetic appeal and aesthetic formality evoke emotions among users during the COVID-19 pandemic? Second, what is the role of pleasure, arousal, and dominance on continued usage intentions? Third, do emotions mediate the association between aesthetic appeal and aesthetic formality, and continued usage intentions?

We address these research questions through the pleasure arousal dominance (PAD) theory which was originally developed from the environmental psychology perspective (Mehrabian and Russel, 1974). Studies suggest that consumers' feelings and perceptions of the physical environment are captured in the fundamental emotions of pleasure, arousal, and dominance which are independent dimensions (Loureiro et al., 2020; Yang et al., 2020). These emotions are generated due to changes in the external environment (e.g., Shankar et al., 2020). The pandemic has created a situation in which consumers' feelings and perceptions are getting reflected in their emotions through various cues. Adoption and continued usage intention of food delivery apps is one such cue which is closely associated with consumers' emotions. In this

study, we develop a comprehensive model to understand the influence of an apps' aesthetic appeal and formality on continued usage intentions of FDAs in COVID-19 pandemic using the PAD theory. We test the model by collecting data from 341 respondents who used FDAs during the pandemic. The findings of the study offer multiple novel contributions to literature and practice of FDAs, hospitality, and continued usage intentions during a pandemic.

The paper is organized as follows. In the next section we review the literature on FDAs and PAD theory and propose our hypotheses and conceptual model. The methodology section highlights the data collection and analysis process followed by the results and discussion of the study findings. The implication section outlines the theoretical and practical contributions of the study. Finally, we conclude the study with an acknowledgement of the limitations and future scope of the study.

2. Literature review

2.1. Food delivery apps (FDAs)

FDAs refer to app-based services which enable consumers to order food online and get it delivered to their doorsteps (Ray et al., 2019; Wang et al., 2019). FDAs primarily work in the form of mobile applications and can be classified into two categories (Zhao and Bacao, 2020): (1) restaurants or catering enterprises such as Domino's, Pizza Hut, or KFC which have created their own apps for receiving online orders and facilitating and offline delivery, and (2) third-party intermediary services (platforms) such as Uber eats, Meituan, Grubhub, Zomato, and Swiggy which act as an interface between consumers and restaurants or catering services (Roh and Park, 2019). Our study focuses on the second type of FDAs which act as an organization of strategic collaboration of franchisees in which the business of food delivery assumes the role of an intermediary.

During COVID-19 pandemic, FDAs followed the contactless delivery process to ensure minimal exposure. FDAs also started several new initiatives such as supplying essentials to consumers, offering COVID insurance to delivery partners, developing pandemic relief fund, and strict adherence to hygiene standards at restaurants for all steps including preparing, cooking, and packing of food (Goyal, 2020). The initiatives and services by organizations offered multiple benefits (e.g., Yadav et al., 2019) to customers by efficiently maintaining social distance and enriching delivery services and to catering enterprises by helping them survive the pandemic and reducing the spatio-temporal delay in order and consumption process (Zhao and Bacao, 2020).

Previous studies explore the adoption or use intentions of FDAs in several countries such as China (Cho et al., 2019; Zhao and Bacao, 2020), South Korea (Lee et al., 2019; Roh and Park, 2019), USA (Gunden et al., 2020), Jordan (Alalwan, 2020), India (Kapoor and Vij, 2018; Ray et al., 2019), and Malaysia (Yeo et al., 2017) among others. These studies adopt multiple theoretical frameworks such as UTAUT2 and UGT, apply quantitative, qualitative, and mixed research designs, and offer interesting insights. For example, Yeo et al. (2017) found that convenience, time and price saving, prior experience, hedonic motivation, and behavioral intentions reinforce each other. Ray et al. (2019) suggest that customer experience, ease of use, listing, and search of restaurants influence the intentions to use FDAs. Mehroliya, Alagarsamy, and Solaikutty (2020) conclude that consumers exhibiting high-perceived threat during COVID-19, less product involvement, less perceived benefit on food delivery, and less frequency of online food orders are less likely to order food through FDAs. Alalwan (2020) show that online reviews, ratings, facility of online tracking along with other UTAUT2 variables significantly influence continued usage intentions. Lee et al. (2019) use UTAUT2 to show that information quality, habit, and social influence play crucial role in continued usage intentions. Additionally, Gunden et al. (2020) propose that mindfulness along with impulse buying tendencies influence consumer intentions to use FDAs. With respect to new technologies, Talwar et al. (2020b) found that

perceived usefulness positively correlated with continuation intention of new technologies such as mobile payment. Talwar et al. (2020b) use information systems success and IT continuance models to show that trust in online apps, especially the ones that require payments, and continued usage of such apps, is a function of the characteristics and information quality of the technology. For new technologies such as online travel agencies, Talwar et al. (2020a) found that benefits barrier is the strongest inhibitor of purchase intentions as well as Talwar et al. (2020b) found that quality of benefits, monetary, social status, information, and preference values are associated with purchase intentions.

However, these studies are silent on the emotional dimensions of consumers which get evoked while using FDAs. Moreover, during the COVID-19 pandemic, FDAs are delivering not only food but also essential supplies such as groceries, first aid, and rations to consumers' doorsteps which further enhances the emotional association of consumers with FDAs. Thus, our study explores the emotional dimensions of consumers and is grounded in the PAD theory.

2.2. Pleasure arousal dominance (PAD) theory

Mehrabian and Russel (1974) propose the PAD theory from an environmental psychology perspective to understand the emotions of people which affect their assessment and consequently, their responses. They describe pleasure, arousal, and dominance as the three fundamental emotions which get generated when consumers encounter any stimuli (Huang et al., 2017). Pleasure is defined as the extent to which consumers feel satisfied, happy, good, or joyful (Yang et al., 2020). Arousal is the extent to which consumers feel stimulated or excited (Chang et al., 2014). Dominance is the cognitive state reflecting the consumers' freedom, autonomy, or control (Hall et al., 2017).

Extant literature covers PAD theory in multiple contexts of technology use and behavior. For example, scholars suggest that dominance and arousal are associated with pleasure which influences attitude and use intentions in the context of Facebook (Hall et al., 2017), purchase intentions in the context of online retail environment (Hsieh et al., 2014), continued usage intentions towards luxury fashion (Jebbarajakirthy et al., 2020) and related websites (Yang et al., 2020), search and purchase behavior for online websites (Chang et al., 2014), and overall satisfaction and recommendations (Miniero et al., 2014). Studies also show that individually each of these emotions significantly influence word-of-mouth behavior (e.g., Shankar et al., 2020) in the context

of online games (Huang et al., 2017), intentions and attitude for websites of destinations (Loureiro, 2015), and affection for websites (Loureiro et al., 2020).

This study adopts PAD in the context of FDAs for two prime reasons. First, previous studies confirm that emotions generated in online environment such as website or app can be effectively captured and understood by PAD framework (Loureiro et al., 2020; Yang et al., 2020). Second, the crisis of COVID-19 pandemic has generated emotions among people which can be assessed by PAD as it provides a visualized overarching framework to study the impact of environmental stimuli which in turn, evoke emotions among consumers.

3. Research model and hypotheses development

We present the research model to address the research questions in Fig. 1. The antecedent variables of the model are aesthetic appeal, aesthetic formality, emotions namely pleasure, arousal, and dominance, and the outcome variable is continued usage intentions. The model proposes that during the pandemic, consumers are motivated by the aesthetic appeal and formality of the FDAs, which may evoke pleasure, arousal, and dominance in the consumers and drive them to revisit the FDAs. We present a brief description of the model constructs in Table 1.

3.1. Aesthetic appeal and PAD

Aesthetic appeal refers to the degree of pleasure and enjoyment that consumers obtain from online interface (Chang et al., 2014). Previous studies suggest that aesthetic appreciation gets reflected in fundamental emotions that affect behavior (Reppa et al., 2020). Greater level of aesthetic appeal and entertaining properties of websites evoke sensory pleasure, build positive attitude, and continued usage intentions among consumers (Bastida and Huan, 2014; Gatautis and Vaiciukynaite, 2013). Scholars confirm that aesthetic formality elicits positive emotions among consumers for online shopping (Chang et al., 2014) which strengthens loyalty among consumers (Tsai, 2017). Photographs used in websites which represent aesthetics are known to offer more sensory enjoyment among users (Bufquin et al., 2020). Previous studies also confirm that hedonic consumers are persuaded by aesthetics of interface (Reppa et al., 2020) and exhibit a variety of emotions which are evoked by the aesthetic quality of FDAs. FDAs are increasingly using optimal design and interface (Kapoor and Vij, 2018) such as rich graphics or

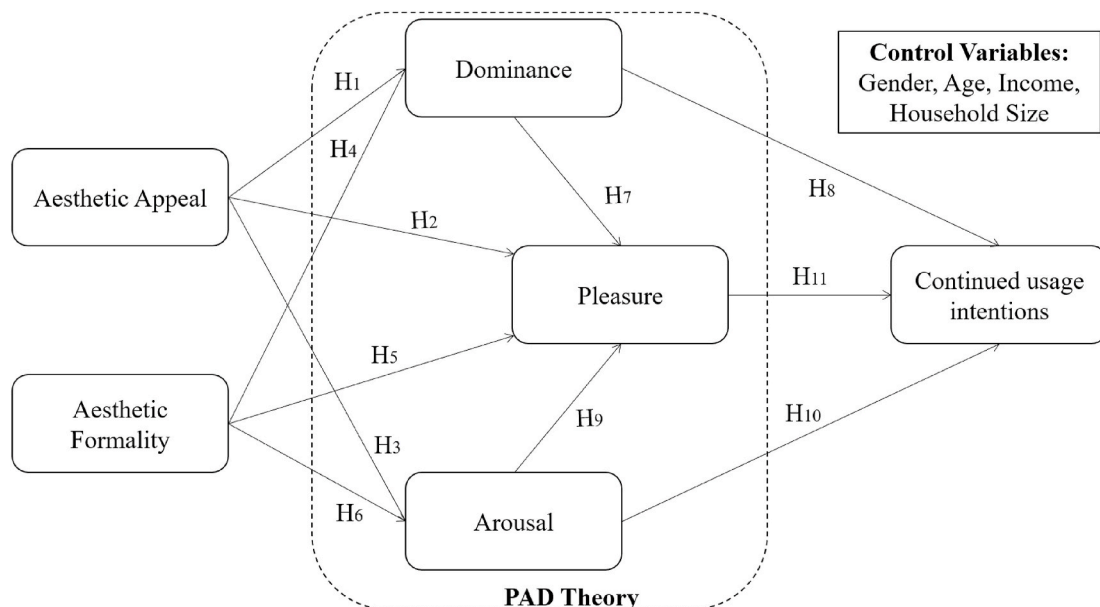


Fig. 1. Research model.

Table 1
Brief description of study construct.

Constructs	Description	Relevant studies
Aesthetic appeal (AP)	It refers to the degree of pleasure or enjoyment experienced by the consumers while using the food delivery apps	Change et al. (2014); Reppa et al. (2020)
Aesthetic formality (AF)	It refers to the extent to which food delivery apps are well organized or simple with consumer-friendly layout	Change et al. (2014); Reppa et al. (2020)
Arousal (ARO)	It refers to the degree of stimulation or level of excitement, alertness, and activity caused by food delivery apps	Huang et al. (2017); Loureiro et al. (2020)
Pleasure (PLS)	It refers to the degree to which a consumer feels pleasure or happy when experiencing food delivery apps	Huang et al. (2017); Loureiro et al. (2020)
Dominance (DOM)	It refers to the degree of influence and power on the food deliver apps' specification, realization and outcome	Huang et al. (2017); Loureiro et al. (2020)
Continued usage intentions (CUI)	It refers to the extent to which consumers have made conscious plans to visit food delivery apps and execute actions in future	Wang et al. (2019); Yang et al. (2020)

image-based interface which may evoke fundamental emotions. Moreover, during the COVID-19 pandemic, FDA companies have transformed their design to evoke a sense of security and safety by clearly mentioning guidelines of food preparation and delivery. Such details are likely to satisfy consumers and minimize the fear of getting infected during the food delivery process. The aesthetic appeal of FDAs further makes the app visits enjoyable, exciting, and evokes a sense of control. Interacting with FDAs with higher aesthetic appeal may make consumers feel happy and excited or be a source of powerful persuasion. Thus, we hypothesize that:

- H1. Aesthetic appeal is positively related to pleasure.
- H2. Aesthetic appeal is positively related to arousal.
- H3. Aesthetic appeal is positively related to dominance.

3.2. Aesthetic formality and PAD

Aesthetic formality refers to the design of an online interface which reflects simplicity, is well structured, and improves user responsiveness with legible fonts (Chang et al., 2014). It means that an app is designed to promote economy, utility, readability, and practicality with readable and simple words on the landing page (Chang et al., 2014). Previous studies support the role of aesthetic appeal while completing online transactions and establishing association. For example, Kumar et al. (2018) conclude that appearance of texts on landing page along with an appropriate colour combination, legibility, and clean words is associated with emotions and determines loyalty. Shen et al. (2016) find that aesthetic formality can evoke a set of emotions among consumers whereas Chang et al. (2014) indicate that poor design and quality of landing page may reduce the positive emotions. FDAs and other online businesses are attempting to make landing pages as engaging as possible. This includes using attractive designs, appropriate word design and size, and background for easy navigation. Apps with higher aesthetic formality make it easy for consumers to discover their favourite restaurants, further evoking PAD emotions. For example, during the COVID-19 pandemic, FDA service providers were offering pictorial representations of the food preparation and delivery process to reassure customers of their precautionary measures. FDAs were clearly listing details of the necessary precautions that service providers follow in addition to government norms in their landing pages as well as the packaging of the delivered food. Such actions may joy, excitement, and feeling of control among consumers which are routed through the legible fonts and aesthetics formality of apps. Hence, we hypothesize that:

- H4. Aesthetic formality is positively related to pleasure.
- H5. Aesthetic formality is positively related to arousal.
- H6. Aesthetic formality is positively related to dominance.

3.3. Dominance, pleasure, and continued usage intentions

Dominance is an emotion which refers to the extent to which individuals believe they are in control of their environment (Miniero et al., 2014). Pleasure is the extent to which individuals perceive their environment to be satisfying and enjoyable (Hall et al., 2017). Extant literature points to an association between dominance and pleasure. Studies find dominance to be positively associated with pleasure which leads to satisfaction and recommendation (Miniero et al., 2014). Hall et al. (2017) find that dominance positively influences pleasure which determines the attitude and intentions to use social media. Hsieh et al. (2014) and Chang et al. (2014) report a positive association between dominance and pleasure in the context of website atmosphere and online retailing, respectively. In the context of FDAs, consumers' perceived control over the app may intensify consumer feelings, leading to engagement with the app for a longer period of time. We posit that during the COVID-19 pandemic, the availability of time is likely to give enough exposure to consumers to realize the benefits of apps which may evoke the feeling of satisfaction and pleasure. Thus, we hypothesize that:

- H7. Dominance is positively associated with pleasure state in experiencing FDAs.

Extant literature shows mixed results of the association between dominance and behavioral outcomes. For example, Loureiro (2015) find a positive association between dominance and attitude but no significant association between dominance and continued usage intentions of travel websites. Hsieh et al. (2014) show positive association between perceived dominance and purchase intentions in online retail environment. Huang et al. (2017) find support for a positive association between dominance and word of mouth for online games. In the context of FDAs, we posit that consumers are likely to cherish the dominance state as FDAs are designed to help consumers complete the task with ease and convenience. During the COVID-19 pandemic, these benefits offer consumers a sense of control over the environment and increasing the likelihood that consumers would revisit the FDAs to experience the same. Thus, we hypothesize that.

- H8. Dominance is positively associated with continued usage intentions of FDAs.

3.4. Arousal, pleasure, and continued usage intentions

Arousal refers to the extent to which individuals feel the excitement or stimulation (Miniero et al., 2014). Prior studies find a positive association between arousal and pleasure. For instance, Hall et al. (2017) find that arousal determines the pleasure that an individual experiences which influences attitude and intentions to use social media platforms like Facebook. Arousal is known to positively influence pleasure of using travel websites (Loureiro, 2015) and online retailing websites (Chang et al., 2014). Hsieh et al. (2014) and Yang et al. (2020) report similar findings in the context of website atmosphere and online fashion brand websites, respectively. For FDAs, we posit that consumers are excited by the design as well as the benefits FDAs offer. During COVID-19 pandemic, the excitement related to FDAs is likely to result in greater satisfaction experienced by consumers using FDAs. Thus, we hypothesize that:

- H9. Arousal is positively associated with pleasure state in experiencing FDAs.

Previous studies offer mixed findings on the relationship between arousal and behavioral intentions. Scholars suggest that arousal

positively influences cognitive processing, affection, and activation (Loureiro et al., 2020) which influence the word-of-mouth (e.g., Kumar and Purbey, 2018) behavior for online games (Huang et al., 2017). But arousal is insignificantly associated with intentions to revisit and provide recommendations in the case of island related websites (Loureiro, 2015). In context of FDAs, we posit that consumers are aroused by the advantages of FDAs which drive them to an excited state and during the COVID-19 pandemic, consumers would like to re-experience the arousal state by continuing to use the FDAs. Thus, we hypothesize that:

H10. Arousal is positively associated with continued usage intentions of FDAs.

3.5. Pleasure and continued usage intentions

Studies suggest that pleasure is associated to attitude, word of mouth, and behavioral intentions. Huang et al. (2017) find a positive association between pleasure and word of mouth. Miniero et al. (2014) conclude that pleasure leads to satisfaction and recommendation. Hall et al. (2017) suggest that pleasure shapes the attitude which in turn influences the intentions to use social media platforms like Facebook. Loureiro (2015) indicate that pleasure is associated with revisiting and recommendation intentions for online retailing. Chang et al. (2014) report similar findings in which they confirm that pleasure determines search and purchase behavior for online shopping. Yang et al. (2020) find support for a positive association between pleasure and continued usage intentions. In the context of FDAs, we posit that the pleasure offers satisfaction to consumer which determines the intentions (Miniero et al., 2014). During Covid-19 pandemic, satisfied consumers are more likely to revisit the FDAs to experience the emotional state of enjoyment. Thus, we hypothesize that:

H11. Pleasure is positively associated with continued usage intentions of FDAs.

3.6. Mediation effect of pleasure, arousal, and dominance

In addition to direct effects, the study aims to explore the mediating effects of pleasure, arousal, and dominance on the associations between aesthetic appeal, aesthetic formality, and continued usage intentions. Previously, we explored the relationships proposed in our research model (Fig. 1) as direct effects. In the same vein, we propose to study the mediating effect of PAD emotions on our proposed relationships. The pursuit for mediation effect analysis is guided by previous studies which confirm the mediating role of emotions on relationships between website atmospheric variables and outcome variables (e.g., Huang et al., 2017; Yang et al., 2020). Consequentially, we posit that the PAD emotions will mediate the relationships between aesthetic appeal as an input variable and continued usage intentions of consumers as the outcome variables. Consumers' experience of pleasure, arousal, and dominance emotions may not be same while using FDAs. In line with Hall et al. (2017) we argue that consumer experiences of pleasure and continued usage intentions are mediated by the varying levels of arousal and dominance, and they influence continued usage intentions of consumers. Hence, we hypothesize that:

H12. (a, b): The association between aesthetic appeal and pleasure is mediated by (a) dominance, and (b) arousal.

Aesthetic formality manifests in the form of simplicity, structure, responsiveness, and readability of a website or an app (Chang et al., 2014). Prior literature documents the role of emotions as a mediator in the relationship between app characteristics as input variables and usage intentions as output variables (Huang et al., 2017). Hence, we argue that the influence of aesthetic formality on pleasure and continued usage intentions (as hypothesized from H1-H11) will be mediated by the arousal and dominance that consumers experience while using FDAs. The extent of the mediation effect of the PAD emotions on the proposed

relationships between aesthetic formality and continued usage intentions is a function of the extent to which consumers experience the PAD emotions while interacting with FDAs. Hence, we propose that:

H13. (a, b): The association between aesthetic formality and pleasure is mediated by (a) dominance, and (b) arousal.

Scholars have confirmed that pleasure is associated with multiple behavioral outcome such as recommendation intentions, revisit intentions, or purchase intentions (Chang et al., 2014). Also, dominance and arousal have found to be associated with pleasure by several context such as online shopping, online retailing (Yang et al., 2020). In the context of FDA, we posit that dominance or arousal is associated with pleasure as consumers feel the control and are excited by the benefits of FDA that may lead consumers to use FDA during the COVID-19 pandemic as well. Thus, we hypothesize that.

H14. (a, b): Pleasure mediates the association between (a) dominance and continued usage intentions, and (b) arousal and continued usage intentions.

4. Research methodology

4.1. Survey design and pilot study

We adopt the survey-based questionnaire approach to collect the data from respondents. The survey instruments are based on pre-established scales from previous studies - aesthetic appeal and aesthetic formality from Chang et al. (2014), pleasure, arousal, and dominance from Huang et al. (2017), and continued usage intentions from Yang et al. (2020). We utilized a five-point Likert's scale to collect the responses where 1 refers to strongly disagree and 5 refers to strongly agree. After preparing the survey and contextualizing the questionnaire to FDA context, we requested independent experts who are not a part of the study to refine the survey instruments. Further, to ensure face and content validity, the survey was validated by two independent researchers who are experts in online retailing. The experts recommended minor changes to the phrasing of certain items which were incorporated in the final questionnaire.

After incorporating the suggested change in survey, a pilot study was conducted by collecting data from 24 FDAs users who used FDAs during the COVID-19 pandemic. Pilot study was performed to ensure the validity and reliability of constructs which was ensured by the results of pilot study. Cronbach Alpha for all the constructs were found to be greater than the recommended cut-off value of 0.7.

4.2. Data collection and demographic information

We circulated the final survey through online medium to consumers who use FDAs. Offline data collection was not possible during the pandemic, so we reached out to participants through online channels. We adopted multi-prong approach to recruit participants and followed recommendations for data collection on online platforms (Newman et al., 2020). Data was collected from primarily Indian youth as they are well adept at using smartphone which is one of the essential criteria for using the FDAs. Deriving the insights from one of the largest market for FDAs, India (Statista, 2020a), the study offers insights from the market that can be applicable to other contexts as well. Thus, we believe Indian consumers are an appropriate sample of respondents for our study. We have set the eligibility criteria for the study as only those consumers who have used the FDAs at least once during COVID-19 would participate in the survey. We visited the FDAs and social media pages of FDAs and contacted participants who had posted comments about the food orders they had received and their experiences with the FDAs. We sent the survey link by email to potential participants after getting their details from food delivery apps and social media platforms. The survey link consisted of a brief explanation of the study purpose, and the process of

responding to and submitting the survey. We collected the data over a period of 6 weeks during pandemic. We reached out to 730 consumers and after factoring in for outliers, and missing responses we received 341 valid responses indicating a 46.7% response rate (Table 2).

The respondents' mean age was 35 years and 76% respondents belonged to 18–60 years. A total of 49% respondents were female and 48% were having graduate and above as educational background. Also, 52% of the respondent belong to 2–4-member family household. The details of demographic characteristics are presented in Table 2.

4.3. Control variables

Previous studies have indicated that demographic variables may impact the intended dependent variable (See Tandon et al., 2020a; Tandon et al., 2020b, 2021; Talwar et al., 2021). Age and gender are important variables in studies on usage of new technology (e.g. Talwar et al., 2019, 2020c,d). We use age, gender, education, and number of household members as control variables to assess the profound impact of independent variables and ensuring the robustness of the findings (Chang et al., 2014; Huang et al., 2017). These demographic variables influence the use and adoption of any internet based technological products including food delivery apps. Scholars indicate that young consumers have higher readiness to use apps for purchases than older consumers (Linnhoff and Smith, 2017). Literature also says that consumers with higher level of education are more likely to use app-based transactions or services than less educated consumers (Ncube and Koloba, 2020). Further, household size (Zhao et al., 2018; Kumar et al., 2021a) and gender also influence app use among consumers (Linnhoff and Smith, 2017). Thus, we use these variables as control variables to reduce the extraneous effects which may give spurious results.

4.4. Testing for common method bias

We conduct preliminary data analysis to examine normality and common method bias in the study. Results show that skewness (–0.8 to 0.8) and kurtosis (–3 to 3) were well within the acceptable range indicating that the data collected follows a normal distribution (George and Mallery, 2010). Since we collect data simultaneously for both dependent and independent variables simultaneously from a single source, we test for common method bias using three methods. First, we conduct Harman's single factor test. Findings indicate that a single factor explains 32.4% of variance which is below the cut-off limit of 50% (Podsakoff et al., 2012). Second, we follow the approach suggested by Malhotra et al. (2006). Malhotra et al. (2006) suggest that we compare the fit indices of the proposed model with that of a single factor model to assess common method variance of the study. Results show that the fit indices of the six-factor model conceptualized in our study (i.e., $\chi^2/df =$

Table 2 Demographic profile of respondents.

Characteristics	N	%	Cumulative percentage
Gender			
Male	173	50.73%	50.73%
Female	168	49.27%	100.00%
Age			
<18 years	72	21.10%	21.11%
18–40 years	133	39.01%	60.12%
40–60 years	127	37.24%	97.36%
>60 years	9	2.64%	100.00%
Education			
Undergraduate	176	51.61%	51.61%
graduate	124	36.36%	87.98%
Postgraduate and above	41	12.02%	100.00%
Household members			
<2 members	129	37.83%	37.83%
2-4 members	178	52.20%	90.03%
>4 members	34	9.97%	100.00%

2.12, CFI = 0.91, GFI = 0.92, AGFI = 0.92, NFI = 0.93, TLI = 0.95, RMSEA = 0.05) are significantly better than a single-factor model (i.e., $\chi^2/df = 10.25$, CFI = 0.25, GFI = 0.43, AGFI = 0.46, NFI = 0.58, TLI = 0.49, RMSEA = 0.27). The results provide evidence that common method bias in our study is well within the acceptable limit and allows us to proceed with further analysis. Lastly, the study utilized common latent factor technique (Eichhorn, 2014) and confirmatory factor analysis marker variable technique (MacKenzie and Podsakoff, 2012). These approaches indicates that common method bias was not an issue for this study, and we can proceed with data analysis.

5. Results

5.1. Reliability, validity, and measurement model

We analyze the measurement model to check reliability and validity of constructs. Factor loading scores of all the items of the study variables are above 0.7 (refer to Table 3) (Nunnally, 1994) which is higher than the threshold value of 0.6 (Hair et al., 2010). The values of composite reliability (CR) and average variance explained (AVE) are greater than the acceptable limit of 0.7 and 0.5 respectively (Table 4) (Hair et al., 2010). Thus, we confirm that our measures for testing the proposed model meet the internal reliability and convergent validity criteria. To establish discriminant validity, we construct Fornell and Larcker table (Table 4). We find that the square root values of AVE (on the diagonals) are greater than the inter-construct correlational values (on the left of the diagonals) (Fornell and Larcker, 1981) which confirms that the model meets the conditions for discriminant validity. Further, the correlations between pairs of study measures are positive, but below 0.80, as recommended by Kline (2015).

5.2. Analyzing the structural model

We analyze the structural model to test the proposed hypotheses. The goodness of fit indices (i.e., $\chi^2/df = 2.13$, CFI = 0.90, GFI = 0.91, AGFI = 0.92, NFI = 0.93, TLI = 0.94, RMSEA = 0.05) are acceptable as per the recommended standard (Hair et al., 2010) (Table 4). Results indicate that aesthetic appeal is significantly associated with dominance (H1: β

Table 3 Factor Loadings of items.

Study Measures	Measurement items	Loading value
Aesthetic formality (AF) (Wang et al., 2011))	FDA is Well Organized	0.88
	FDA is Ordered	0.89
	FDA is Legible	0.73
Aesthetic appeal (AP) (Wang et al., 2011)	FDA is Fascinating	0.86
	FDA is Creative	0.80
	FDA is Impressive	0.86
Arousal (ARO) (Huang et al., 2017)	FDAs seems very exciting during the COVID-19 pandemic	0.93
	I feel very excited to use FDA during the COVID-19 pandemic	0.94
Pleasure (PLS) (Huang et al., 2017)	I feel joyful while using the FDAs during the COVID-19 pandemic	0.86
	I feel pleased while using the FDAs during the COVID-19 pandemic	0.86
Dominance (DOM) (Huang et al., 2017)	I feel gratified while using the FDAs during the COVID-19 pandemic	0.80
	The FDA is better to use, I seem to have control over app during the COVID-19 pandemic	0.91
Continued usage intentions (CUI) (Yang et al., 2020)	I feel I have the right to control the FDA during the COVID-19 pandemic	0.90
	I intend to return to the FDA again during the COVID-19 pandemic	0.83
	I intend to visit the FDA again during any crisis	0.85
	I expect to revisit the FDA in future	0.91

Table 4
Validity and reliability analysis.

	α	CR	AVE	MSV	ASV	AF	AP	ARO	PLS	CUI	DOM
AF	0.8	0.87	0.72	0.03	0.01	0.85					
AP	0.8	0.88	0.71	0.02	0.02	0.60	0.84				
ARO	0.9	0.94	0.88	0.03	0.01	0.47	0.55	0.94			
PLS	0.8	0.88	0.71	0.04	0.02	0.50	0.42	0.57	0.84		
CUI	0.8	0.90	0.75	0.03	0.02	0.46	0.40	0.42	0.54	0.87	
DOM	0.8	0.90	0.81	0.04	0.03	0.45	0.41	0.54	0.44	0.40	0.90

Note: Cronbach alpha = α , Composite reliability = CR, Average variance extracted = AVE, Maximum shared variance = MSV, Average shared variance = ASV, Aesthetic formality = AF, Aesthetic appeal = AP, Arousal = ARO, Pleasure = PLS, Continued usage intentions = CUI, Dominance = DOM.

= 0.22, $p < 0.01$) and arousal (H3: $\beta = 0.43$, $p < 0.001$). Aesthetic formality is significantly associated with dominance (H4, $\beta = 0.33$, $p < 0.001$), pleasure (H5, $\beta = 0.28$, $p < 0.01$), and arousal (H6, $\beta = 0.22$, $p < 0.01$). Arousal is positively associated with pleasure (H8, $\beta = 0.42$, $p < 0.001$) and dominance (H9, $\beta = 0.16$, $p < 0.01$) and pleasure (H10, $\beta = 0.42$, $p < 0.001$) are positively associated with continued usage intentions.

Our findings support all proposed hypothesis (H1, H3, H4, H5, H6, H8, H9, and H10) except H2, H7, and H11 (Table 5). We could not find the support for association between aesthetic appeal and pleasure (H2, $\beta = -0.01$, $p > 0.05$), dominance and pleasure (H7, $\beta = 0.03$, $p > 0.05$), and arousal and continued usage intentions (H11, $\beta = 0.04$, $p > 0.005$) (Fig. 2). Results also show that the model explains 24% variance in dominance, 41% variance in pleasure, 34% variance in arousal, and 34% variance in continued usage intentions.

5.3. Mediation analysis

In addition to direct effect, the study also examines the mediating effect of emotions. We begin by examining the necessary conditions for mediation analysis which involves establishing a significant association between the independent and mediating variables and the mediating and dependent variables (Schneider et al., 2005). Therefore, we test the associations between aesthetic appeal, aesthetic formality, pleasure, arousal, dominance, and continued intentions. Results (Table 6) confirm that the model meets the necessary conditions for mediation. Next, we study the mediation effect. Findings indicate significant mediating role of arousal and pleasure on the relationship between app aesthetics and formality, and continued usage intentions (Table 6). Results show that the arousal experienced by an FDA user mediates the association between aesthetic appeal of the app and the pleasure experienced (direct effect = 0.06, $p < 0.05$, indirect effect = 0.14, $p < 0.05$) and pleasure mediates the association between arousal and continued usage intentions of FDAs (direct effect = 0.09, $p < 0.05$, indirect effect = 0.17, p

Table 5
Result of hypotheses.

Hypothesis	Path	β	Significance	Support
H1	Aesthetic Appeal → Dominance	0.22**	<0.01	Yes
H2	Aesthetic Appeal → Pleasure	-0.01	>0.05	No
H3	Aesthetic Appeal → Arousal	0.43***	<0.001	Yes
H4	Aesthetic Formality → Dominance	0.33***	<0.001	Yes
H5	Aesthetic Formality → Pleasure	0.28**	<0.01	Yes
H6	Aesthetic Formality → Arousal	0.22**	<0.01	Yes
H7	Dominance → Pleasure	0.03	>0.05	No
H8	Dominance → Continued usage intentions	0.16**	<0.01	Yes
H9	Arousal → Pleasure	0.42***	<0.001	Yes
H10	Arousal → Continued usage intentions	0.04	>0.05	No
H11	Pleasure → Continued usage intentions	0.42***	<0.001	Yes

< 0.05). We find significant support for H12b and H14b respectively but not for other mediation hypothesis. Both these hypotheses were formulated to represent the relationship between aesthetic appeal and continued usage intentions among FDA users. Thus, we find that the PAD emotions significantly mediate the relationships between aesthetic appeal and continued usage intentions but not aesthetic formality. Table 7 presents the indirect effect of arousal and pleasure on pleasure and continued usage intentions of FDAs among consumers.

The results also revealed no influence of age, gender, income, and household size. The findings of control variables are in coherence with previous studies (e.g., Cho et al., 2019; Kumar, Murphy, Talwar, Kaur and Dhir, 2021b).

6. Discussion

Emotional branding is used as a practical approach to improve continued usage intentions among consumers (Yang et al., 2020). The findings of the study confirm that aesthetic appeal is significantly associated with dominance (H1) and arousal (H3) which is supported by findings of previous studies in the context of websites (e.g., Loureiro, 2015; Loureiro et al., 2020). Aesthetic formality is significantly associated with dominance (H4), pleasure (H5), and arousal (H6) which is consistent with prior studies in the context of websites (e.g., Change et al., 2014; Huang et al., 2017; Yang et al., 2020). Aesthetic design and aesthetic formality of FDAs allow consumers to use the FDAs with ease, explore the functionality and theme which excites consumers, and creates a perception of greater control over behavior among consumers. The aesthetics such as easy navigation, search options, legible and attractive designs generate the emotions of arousal, pleasure, and dominance. The study could not find association between aesthetic appeal and pleasure (H2) which contrasts with the findings of prior studies in other contexts (e.g. Loureiro et al., 2020). A possible explanation for the findings could be that most of the FDAs are designed to promote easy execution of ordering process and have not focused much on developing design aesthetics which promote enjoyment and attract consumers.

The findings of the study also indicate that arousal is associated with pleasure (H8) which is supported by previous studies (e.g., Hall et al., 2017; Hsieh et al., 2014; Yang et al., 2020). Consumers using FDAs are excited by the concept of ordering and receiving food with higher convenience which evokes a sense of pleasure among consumers. During a crisis situation (like the COVID 19 pandemic), consumers are excited to use FDAs as it allows ordering and receiving food from the comfort home, while maintaining social distance, and without compromising on safety. However, contrary to previous findings (e.g., Minihero et al., 2014; Yang et al., 2020) we did not observe a significant association between dominance and pleasure. A reason behind this could be the role of hunger in a consumer's FDA experience. Consumers use FDAs when they are hungry and hunger drives their action, reducing the perception of control consumers believe they have over their actions while using FDAs. The lack of control and hunger could be overpowering the emotion of pleasure which consumers may derive while using FDAs.

The results indicate that dominance (H9) and pleasure (H10) are significantly associated with continued usage intentions which is supported by prior studies in the context of websites (e.g., Yang et al.,

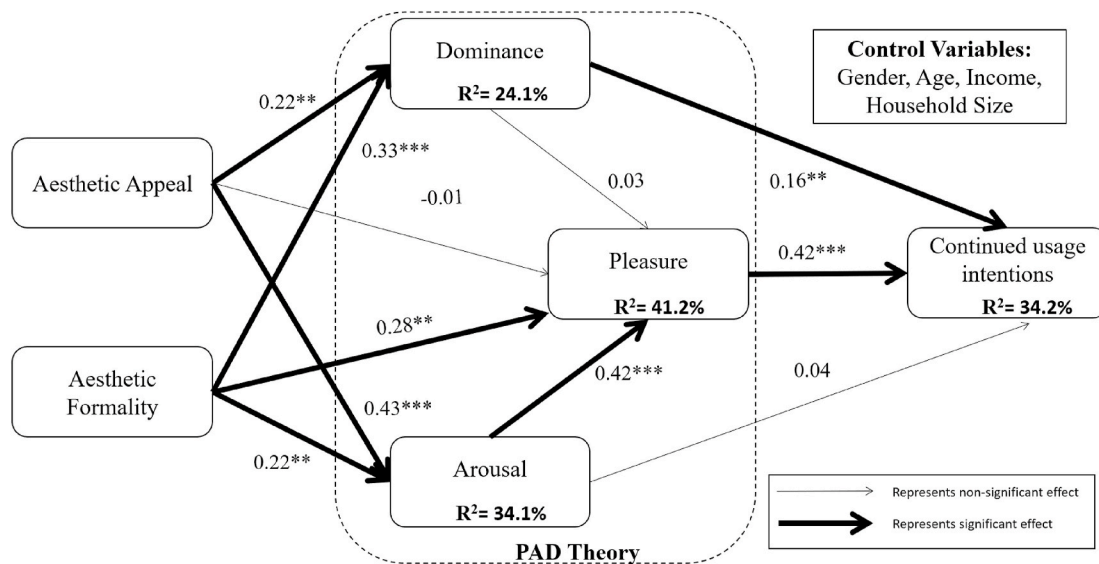


Fig. 2. Results of research model.

Table 6 Results of mediation analysis.

AP → ARO → PLS						
	β	SE	t	p	LLCI	ULCI
AP → ARO	.12	.07	5.21	.00	.007	.284
AP → PLS	.06	.02	3.02	.00	.051	.380
ARO → PLS	.11	.04	3.66	.00	.019	.251
Total effect of AP → PLS	.17	.06	2.89	.00	.080	.310
ARO → PLS → CUI						
	B	SE	t	p	LLCI	ULCI
ARO → PLS	.26	.02	13.02	.00	.068	.421
ARO → CUI	.09	.02	4.42	.00	.028	.182
PLS → CUI	.11	.04	3.66	.00	.019	.251
Total effect of ARO → CUI	.16	.04	4.03	.00	.071	.289

Note: Aesthetic appeal = AP, Arousal = ARO, Pleasure = PLS, Continued usage intentions = CUI.

Table 7 Indirect effects between dependent and independent variable.

Path	Effect	Se	LLCI	ULCI
AP → ARO → PLS	.14	.05	.007	.231
ARO → PLS → CUI	.15	.05	.030	.240

Note: Aesthetic appeal = AP, Arousal = ARO, Pleasure = PLS, Continued usage intentions = CUI.

2020). Although prior studies have explored the role of pleasure on purchase or use intentions (e.g., Change et al., 2014; Hall et al., 2017; Loureiro, 2015), this study extends the literature by acknowledging the role of pleasure and dominance on continued usage intentions. During the pandemic and the resultant lockdown, most consumers have been experiencing cessation of many important services, revisiting the FDAs offer a greater sense of control and pleasure. As soon as the lockdown was removed, consumers revisited the FDAs to experience the pleasure of ordering the food and felt a greater sense of dominance while using FDAs. Findings also indicate that arousal is not significantly associated with continued usage intentions (H11). Previous studies have not explored the role of arousal on continued usage intentions thus, the findings contribute to the FDA literature. Consumers using FDAs are aroused by design and aesthetics, but the excitement is possibly stemming from hunger and not app design. The non-significant association

between arousal and continued usage intentions indicates that consumers do not acknowledge the arousal emotion generated by FDAs.

Apart from direct effects, the study also examines the mediating role of emotions on continued usage intentions. Findings suggest that arousal mediates the association between aesthetic appeal and pleasure as aesthetic appeal reflects the entertaining properties of FDAs which excites consumers, which in turn evokes sense of pleasure among them. FDAs are constantly improving their aesthetics by including rich graphics, photographs, and other image-based design (e.g., Kapoor and Vij, 2018) which arouse consumers. This aroused state induces a sense of pleasure among consumers. Our findings further suggest that pleasure mediates the association between arousal and continued usage intentions and arousal from an app's appeal is a stronger explainer of pleasure than dominance. Consumers who are excited or aroused by FDAs services experience pleasure which further motivates them to revisit the FDAs. The experience of pleasure also brings satisfaction of using FDAs to the excited consumers (e.g., Yang et al., 2020) and provides the impetus to continue using the FDAs.

7. Implications and limitations

7.1. Theoretical implications

The study offers three key contributions to literature. First, the study investigates the factors determining the continued usage intentions of FDAs during COVID-19 pandemic. Thus, the study contributes to the literature of technology use in emergency situations, primarily during a pandemic (e.g., Pan et al., 2020; Xie et al., 2020). Further, our study is conducted in the India which is the third largest FDA market (Statista, 2020a). Limited studies have explored the findings from a developing country context. Thus, findings of the study add to the knowledge of consumer behavior towards FDA use from a developing country perspective (India was among the five countries with highest COVID-19 cases during the pandemic and was known to have implemented the strictest and largest lockdown measures).

Second, the study adopts pleasure arousal dominance theory to investigate the influence of app aesthetics on emotions in context of FDAs. PAD theory argues that emotions evoked due to an external stimulus can be categorized in three fundamental dimensions of pleasure, arousal, and dominance (Huang et al., 2017). The findings of the study confirm the applicability of pleasure, arousal, and dominance emotions in the FDAs context. The study argues that the aesthetics of the app create a situation and act as the external stimuli which generates the

emotions of pleasure, arousal, and dominance. Thus, the study extends the PAD theory to the context of FDAs. The proposed inclusive model substantially adds to the evolving literature of FDAs (e.g., Alalwan, 2020; Lee et al., 2019; Zhao and Bacao, 2020) and the literature of PAD theory (Loureiro et al., 2020; Yang et al., 2020). The study also paves way for future studies by (a) investigating other antecedents of app use that may evoke emotions among consumers and (b) exploring the influence of emotions on outcome variables such as recommendation intentions or word of mouth behavior.

Lastly, the study explores the concept of continued usage intentions which is rarely explored in the FDAs context. Majority of the studies are focused on adoption or use intentions (e.g., Cho et al., 2019; Ray et al., 2019). This study extends existing consumer behavior literature by incorporating the factors that influence the continued usage intentions of FDAs in a crisis such as the COVID-19 pandemic. We establish the validity of studying app usage in the form of continued usage intentions instead of adoption during a crisis. We observe that continued usage intentions towards FDAs during a crisis like the COVID-19 pandemic could be an outcome of the FDAs taking necessary steps to reduce the risk perception among consumers.

7.2. Practical implications

The pandemic has accelerated the rapid rate of digital transformation across industries. Even businesses with traditional business models have been forced to move their operations online to some extent, to cater to the uncertainty in the business environment due to strict lockdowns and curfews imposed as measures to contain the spread of COVID 19. Many organizations and managers are making the transition to app-based deliveries of their products and services. The growth of digital as a channel has increased manifold. This study offers practical solutions to managers of food delivery companies, but the insights can be used by other app-based companies (e.g., online payment apps, streaming apps, music apps, information apps etc.) looking to improve their customer retention rates.

The study has three practical implications for managers as well as FDA designers. First, findings indicate the crucial role of aesthetic formality on continued usage. This suggests that app designers and managers should focus on developing well designed, readable, and simplistic apps. As app developers work on updates, customer engagement, navigation, and usage data should be used to continuously improve the simplicity, minimalistic nature, usability, and design of the app. Instead of heavy graphics which could be distracting and hence reduce the sense of positivity and control, app developers should focus on design aspects which are responsible for evoking positive emotions among consumers. Managers should strive to ensure that FDAs are clear, clean, symmetrical, and involve design utility, instead of putting too many features and tasks for customers to perform.

Second, findings reveal the importance of aesthetic appeal in evoking excitement and control. Managers and app designers are recommended to develop FDAs which reflect creativity, fascination, and sophistication aspects of the FDAs. Professionally styled and photographed food pictures combined with simple design can offer a sense of sophistication. Other online media formats such as audio or video information may stimulate consumers and evoke positive emotions while using the FDAs. The sense of sophistication would improve customer interaction and continued usage of the app as it evokes a sense of joy and satisfaction, as revealed in the results.

Third, the study establishes the positive effect of pleasure and dominance on continued usage intentions of consumers. This is an important insight for managers of FDAs and other app-based product/service delivery organizations. The study moves from utility of design and puts emphasis on creating perceptions of pleasure and dominance to convey information and system quality. Marketers may use this insight to also manage their marketing communications. For example, advertisements showing consumers using the FDAs to order food quickly,

making choices about contactless deliveries and other safety measures might evoke a sense of certainty amidst the chaos of the pandemic. Especially for consumers like young professionals living in an urban 'work from home' setting away from their families, or consumers quarantined or isolated in areas with limited food supplies and others who are unable to prepare their own food for multiple reasons – the strategy to focus on FDA features evoking pleasure and dominance might be useful. Managers can also use this insight to ensure the app updates factor in the attempt to evoke joy and control every time consumers visit the apps. This could be done by promptly updating apps with different high-quality photographs of food and by offering newly listed restaurants or catering enterprises. A comprehensive listing of restaurants in the apps will provide a greater sense of control among consumers, promoting continued usage intentions. A user-friendly feedback collection mechanism is recommended which consumers perceive as a novel initiative, providing a greater sense of control. Providing them the ability to choose a restaurant for ordering based on collected and analyzed feedback will strengthen the sense of control consumers perceive. Lastly, continued usage intentions can be improved when managers attempt to evoke the sense of pleasure by offering discounts or coupons on each visit or resolve customer complaints and queries as quickly as possible.

7.3. Limitations

Despite the notable contributions, the study has three main limitations. First, ours is a cross sectional study on the continued usage intentions of the FDAs in a particular situation of the COVID-19 pandemic, limiting it to the context of continued usage intentions during a health and safety crisis. Future studies can explore longitudinal or experimental approaches to understand the consumers' perception in multiple crisis situations (e.g., economic crisis, business crisis etc.), investigate causality over time, and make comparisons to comprehensively explain continued usage intentions of FDAs. Second, the findings are based on data collected through a self-reported survey in a single geography and may limit the generalizability of study. Future studies can incorporate the limitation by replicating the study in multiple geographies. Third, the current study utilizes the impact of design in evoking emotions. Future studies may investigate the emotional impact of factors such as discounts, coupons, while using FDAs. Future studies may explore other emotional dimensions which could be specific to the FDAs context. In addition, future research can focus on specific FDAs that can offer greater insights on FDAs.

8. Conclusion

The study investigates the continued usage intentions of food delivery apps during COVID-19 pandemic. We ask three research question to investigate the phenomena: (a) role of aesthetic appeal and aesthetic formality in evoking emotions among users during the COVID-19 pandemic, (b) role of pleasure, arousal, and dominance emotions in influencing continued usage intentions of consumers, and (c) the mediating role of emotions. Our proposed research model is grounded in the pleasure, dominance, arousal framework. The results reveal that aesthetics of FDAs evoked a set of emotions among consumers using FDAs during the COVID-19 pandemic and influenced continued usage intentions towards FDAs. First research question investigates the relationship between app aesthetics and emotions. Findings suggest that aesthetic appeal is associated with dominance and arousal and aesthetic formality is associated with dominance, arousal, and pleasure. We also find arousal to be associated with pleasure. Second research question examines the influence of emotion on continued usage intentions and results suggest that dominance and pleasure are associated with continued usage intentions. Third research question explores the mediating effect of emotions on associations and findings confirm that pleasure mediates the association between arousal and continued usage

intentions. We also observe that arousal mediates the association between aesthetic appeal of FDAs and pleasure derived from using FDAs. The study, thus, offers multiple novel contributions to the literature of FDAs, app aesthetics and PAD theory and has implications for practitioners as well.

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