

Exploring the Big Five Personality Tendencies of Chinese Plant-Based Meat Consumers

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ABSTRACT

This article aims to deeply analyze the five personality traits of green consumers and explore how these traits affect their consumption behavior towards plant-based meat products. This research examines the plant-based meat products offered by three well-known online retailers in China's e-commerce market using a machine learning algorithm and big data model. The study utilizes the BERT model to analyze the personality traits of green consumers. The research results indicate that a majority of plant-based meat consumers are green consumers with open personalities. This study uniquely integrates personality psychology theory with consumer behavior research in online reviews. The research findings offer a fresh perspective on understanding the intrinsic characteristics and behavioral tendencies of green consumers, while also offering valuable insights for green food enterprises to inform future business decisions.

Keywords: Consumer behavior, big five personality, BERT model, digital marketing.

INTRODUCTION

In recent years, sustainable development has become an important topic, which is discussed by practitioners and scientists all over the world. In the process of the global economy, the in-depth understanding of this view has changed the views of market players on production, consumption, products and marketing, that is to say, when consumers use the resources in the environment, they also pay more and more attention to the changes in the environment. Consumers' behavior of turning to green products may help reduce the adverse impact on the environment and benefit their health.

The upsurge of green consumption also makes the analysis of green consumers' personality traits an important part of the analysis of green consumers' behavior. Thus, we also lead to a new question: can consumers' personality traits be inferred from their purchase behavior?

Consumer online feedback plays an important role in business decision-making. Consumer online feedback will affect consumer purchase behavior. However, consumers with different personalities may show different tendencies in commenting behavior, and these comments have a significant reference function for other consumers. Current research is often based on questionnaires, for example, to judge the purchase intention of individuals through their green consciousness (Ansu-Mensah, 2021). However, the validity of such data itself is not very high. Because the purchase behavior of the participants does not occur, there is not necessarily a positive correlation between the purchase intention and it. In this case, we expect to explore the relationship between consumer personality traits and green product consumption behavior through existing factual evidence.

Thanks to the development of AI technology, it is now possible to conduct personality analysis on consumers who have made purchases by training AI models. We use the BERT model to analyze consumers' personality on the Big Five personality. In view of this, this study aims to explore the internal relationship between the Big Five personality characteristics of green plant-based meat consumers and text preference, and in-depth analyze the Big Five personality characteristics of plant-based meat consumers. We aim to test the following three speculations:

1. Among the selected consumers, 90% or more have an openness personality.
2. Among the selected consumers, 10% or less have a neuroticism personality.
3. The extraversion personality score of the big five personality has a positive impact on the likes of the plant based meat's review text.

LITERATURE REVIEW

Green Consumption

In the decades of rapid social development, consumers have increasingly focused on environmental protection, energy consumption, social sustainability, and other aspects when shopping. Their sense of social responsibility has gradually increased, and this trend is collectively known as green consumption or sustainable consumption (Groening et al., 2018). Sustainable consumption behavior refers to consumer behavior that may affect the dynamics and structure of the

biosphere or ecosystems due to changes in material or energy availability (Steg & Vlek, 2009). Sustainable consumption includes an important component of green consumption. In order to cope with the phenomenon of green consumption, more and more enterprises are beginning to engage in green practices, including green marketing, green product development, etc. Companies around the world have begun to reshape their brand strategies with "green marketing" advertisements to appease the growing environmental concerns of green consumers (Miniero et al., 2014).

The trend of green consumption affects consumers' personal behavior and shopping tendencies. The trend of green consumption prompts consumers to pay attention to whether the products or services they purchase will have negative impacts on the environment and ecology (Joshi & Rahman, 2015). This type of person is collectively referred to as green consumers. The increase in green consumers is also actively promoting the expansion of the trend of green consumption. More and more emerging entrepreneurial organizations or companies offering green products or services are appearing in people's daily lives. Especially in the Asian consumer market, the new generation of green consumers has shown a willingness to pay a premium for green products compared to previous generations (Lee, 2008). The preferences of green consumers are expected to become the next dominant force in the Asian consumer market.

Green Foods

Green products are products that meet consumer needs and contribute to building a sustainable world while advocating for environmental protection. Plant meat, as an emerging category of green products, provides a segmented research category for people to study the food field in green products. In recent years, the large amount of carbon dioxide generated by livestock production and high meat consumption has been considered harmful to the development of the Earth's ecosystem (Marinova & Bogueva, 2019). More and more food companies are starting to research meat substitutes such as artificial meat to address this environmental issue (Hocquette, 2016; White et al., 2022). However, due to consumer concerns about food safety and the technology of plant-based meat and cell-cultured meat, green food companies have generated many negative controversies. According to observations on mainstream Chinese online shopping platforms such as Taobao, JD.com, and Alibaba, no products related to cell culture meat have been found for sale on these platforms. Therefore, in this paper, we will not discuss cell culture meat, but only focus on the sales and relate situation of plant-based meat.

Although artificial meat has faced negative controversy, due to its green food characteristics and its ability to meet the needs of vegetarians, plant-based meat has gradually been recognized by Chinese consumers in many marketing practices. Representative brands of plant-based meat sold in China include Beyond Meat, Plant Diary, Haofood, etc. According to a theoretical experiment on consumer product selection, if the price and taste of meat and plant-based meat alternatives are equal, approximately 65% of shoppers will continue to purchase traditional meat products, while only 21% will choose plant-based alternatives (Slade, 2018). For companies selling plant-based meat, acquiring new customers and strengthening repeat purchases from existing customers will become important issues in the company's strategy. In fact, green consumers have shown positive feedback in support of plant-based meat research and development due to their concern for sustainable development and greenery. However, as plant-based meat is directly related to physical health, customers have more concern and higher uncertainty avoidance when consuming it. Consumers are concerned about their food safety issues, so their actual consumption choices tend to be negative. Currently, plant-based meat companies investing huge amounts of money in marketing advertisements to gain recognition from new customers have not received significant market feedback. In the future, plant-based meat companies need to conduct in-depth research on customers who have already purchased plant-based meat and conduct green shopping decision analysis on them to carry out a series of targeted marketing activities. Perhaps this can improve the sales of plant-based meat enterprises and lead them towards better development.

Green Purchasing Decisions

As an important link in promoting sustainable development, the core of green purchasing decision-making lies in the participation and choice of green consumers. In recent years, the relationship between green purchasing decisions and green consumers has gradually become a hot topic in academic research. Scholars have divided the theory of green consumers into six categories of research: values and knowledge, beliefs, attitudes, intentions, motivations, and social confirmation (Groening et al., 2018). These classifications not only reveal the multidimensional characteristics of green consumers, but also provide theoretical support for in-depth analysis of their purchasing decisions.

Existing research on the influencing factors of green purchasing behavior mainly focuses on individual factors and situational factors. Personal factors include perceived behavioral control, emotions, perceived consumer effectiveness, habits, value, knowledge and trust, while situational factors include subjective/social norms, product availability, price, reference groups, product attributes & quality, brand image, storage-related attributes and ecological labels, etc (Joshi & Rahman, 2015). The interweaving of these factors collectively affects the purchasing decision-making process of green consumers.

It is worth mentioning that when studying green purchasing behavior, scholars have conducted in-depth research on the gap between consumer expression of favorable attitudes and actual purchasing behavior (Vermeir & Verbeke, 2006). The existence of this gap reveals the complexity and uncertainty of green consumers in their purchasing decisions.

In the green food industry, 67% of consumers have shown a positive attitude towards green food, but only 4% of consumers have actually purchased this product (Hughner et al., 2007). However, some scholars have shown that the gap between positive

attitudes and negative purchasing behavior is driven by consumer personality factors (Kvasova, 2015). Future research needs to further explore the deep relationship between personality and green consumption decision-making. The complexity and diversity of its influencing factors and mechanisms require a more in-depth analysis in order to reveal the inherent logic and laws of green consumer purchasing decisions.

Green Consumer Personality

The Big Five personality model is a common academic model for studying individual personality. Scholars describe the five personality traits as including openness, extraversion, conscientiousness, neuroticism, and agreeableness (Yoo & Gretzel, 2011). So far, only a few scholars have studied the relationship between green consumption behavior and personality, reporting on the close relationship between five personality traits and green consumption (Duong, 2022; Gustavsen & Hegnes, 2020). In addition, some scholars have confirmed that the Big Five personality traits are rarely used as a prerequisite for predicting green consumption behavior in existing literature (Sun et al., 2018). Therefore, exploring the relationship between green consumption and personality will become a key strategy for green enterprise marketing. Under the current research gap, green enterprises targeting green consumers with different personalities through preference marketing can help them seize market opportunities.

Individuals with different personality traits exhibit different scores in green consumption decisions, and different Big Five personality traits can lead to various green purchasing decisions. For example, individuals with agreeableness are usually kind, supportive, good at caring for and helping others, and force on the needs of the natural environment, so they will pay more attention to green products. Research has confirmed that agreeableness has a significant optimistic impact on attitudes towards green products, but has no effect on the active willingness to purchase green products (Sun et al, 2018). Openness not only refers to a person who is curious and creative, loves new things, but also enjoys participating in various activities that create unique experiences (Kvasova, 2015). Therefore, individuals with Openness characteristics will have a higher acceptance of green products and truly purchase green products for green consumption.

At present, there is a research gap in the personality of green consumers. Consumers who tend to purchase green products but do not buy them are called green consumers, and consumers who truly purchase green products are also green consumers. However, the current research on the personality of green consumers mainly focuses on the impact of personality on green purchase intention. Exploring the personality of green consumers who have made green purchasing decisions may become the main focus of future research by scholars.

Research Method in Green Consumption

Most scholars use the survey method to obtain the willingness to consume when researching green decision-making behavior. Although there are many factors that influence green decision-making behavior, few researchers have attempted to use big data to reverse engineer the personality traits of green product consumers. Screen et al. (2018) obtained 452 samples from India through a questionnaire to study the impact of culture, behavior, and gender on green purchase intention. In China, research analyzing consumer purchase intention from the perspective of product knowledge has also received support from numerous consumers in the form of questionnaires (Chen & Deng, 2016). There is a significant error in obtaining consumer intention through the form of a questionnaire, as the investigators cannot determine whether the respondents have truly purchased green products.

The comments on the internet are all based on the feelings of consumers who have already purchased goods. While many researchers have used online review data and tried various computer techniques to improve prediction models, and have made some achievements, there are also some disadvantages for which improvements are needed. Firstly, in terms of data collection, users' personality characteristics are derived from the Big Five personality questionnaire they filled in independently (Park et al., 2015). This may result in not being able to self-report and objectively describe the characteristics of behaviors. Secondly, in model training, it was more to build new prediction models through regression analysis to improve accuracy (Zhu & Liu, 2016). The reference group of accuracy was based on previous research results and had certain limitations.

In addition, few researchers have applied the prediction models trained by big data model to actual industry research. In psychology and social media, more articles focused on the relationship between personality and language and the relationship between social media behavior and personality (Azucar et al., 2018). In the field of marketing, we know seven key personality traits impact online customer engagement by analyzing the text posted by users (Marbach et al., 2016). In the travel industry, Wang et al. (2021) used text analysis and found that users of P2P accommodation platforms generally score higher in conscientiousness, extraversion, and agreeableness.

Specifically, few scholars have studied the relationship between online review likes and personality. In previous literature, no one has used big data model to establish predictive models and integrate them with the retail of green products. Not to mention exploring the relationship between green product review texts and consumer personality tendencies. Furthermore, it is possible to explore what kind of personalized comment text would attract more consumer recognition. There are research gaps in both aspects, and this article will also propose speculations and test them from these two aspects.

THEORETICAL ELABORATION AND SPECULATION

In the past, many scholars have explored the relationship between Big Five personality traits and green purchasing decisions. These personality dimensions can be used to predict and analyze human attitudes and purchasing behavior towards environmentally friendly products. Research has shown that different personality traits may lead to different green purchasing choices (Ramanaiah et al., 2000). However, the product characteristics of plant-based meat may cause more concern for green and environmentally friendly consumers (Slade, 2018), resulting in differences in the personality traits of plant-based meat consumers compared to other ordinary green product consumers.

Openness Personality and Green Consumption Decision

Plant based meat is an innovative product in the market, which needs a curiosity that most consumers want to try. Studies have shown that people with an open personality are more willing to try new things and are more creative (Tan et al., 2016). In addition, Hirsh and Dolderman's (2007) study on personality, consumer targets, and attitudes to the environment further supports the relationship between open personality traits and green behavior, demonstrating a positive correlation. Soliño and Farizo (2014) found that highly open individuals are more likely to choose options aimed at environmental protection compared to other personality traits. This leads to the speculation: Among the selected consumers, a greater number of individuals exhibit openness personality.

Neuroticism Personality and Green Consumption Decision

However, prior research has demonstrated that there is no significant correlation between neuroticism, characterized by tendencies towards anxiety, anger, depression, and aggression, and engagement in environmentally friendly behaviors. (Fraj & Martinez, 2006). These people are more concerned about the drawbacks of environmental issues, such as environmental degradation, rather than environmental upgrading (Hirsh & Dolderman, 2007). Moreover, the fabrication processes for plant-based products are still innovative in the market. Thus, people with neuroticism may worry about such products' safety and taste. This leads to the speculation: Among the selected consumers, fewer individuals possess neuroticism personality.

Extraversion Personality and The Likes of The Plant-Based Meat's Review Text

In addition, it is not only necessary to consider the relationship between consumer personality and green purchasing decisions, but also to consider that the sample source is online comments, which is a part of social activities. Individuals with high levels of extraversion tend to exhibit a greater propensity for pro-social behaviors, including a willingness to assist and support others. A highly extroverted person will have a positive impact on ecological behavior because they are positive and sociable. Fraj and Martinez (2006) indicated that highly extroverted individuals often exhibit more environmentally friendly attitudes and behaviors, such as green tourism and green food. Meanwhile, extroverts are also more self-aware, which makes their comments more liked (Hong et al., 2017). This leads to the speculation: The extraversion personality score of the Big Five personality has a positive impact on the likes of the plant-based meat's review text.

METHODOLOGY

The research uses big data analysis to build a text recognition prediction Big Five personality model and explores the Big Five personality trends of green plant-based meat consumers and what personality consumption review texts will be more popular.

The Big Five dimensions have been extensively investigated in the context of language usage. Numerous studies have compared self-reports or observer reports of personality traits with patterns of language use. Specifically, the study conducted by Pennebaker and King (2019) suggests that individuals with high levels of neuroticism are more inclined to utilize vocabulary that conveys negative emotions, such as anger, suspicion, and revenge. Additionally, they tend to employ first-person singular pronouns more frequently. Conversely, extraversion is positively associated with the use of positive emotion words and social process words (Schwartz et al. 2013). In short, language cues have been proven to be powerful indicators of personality.

Data Collection

This study collected review data from the two major plant-based meat shops on Taobao that were previously published in December 2023. Compared to other products, the top two best-selling products of PLANT DIARY and BEYOND MEAT have significantly higher sales and number of reviews. This means that the data of these three products are more representative of the industry and have research significance. The samples are obtained through the Taobao API. Subsequently, strict data learning procedures were implemented, including the removal of duplicate data and the estimation of special characters as recommended by Gharatkar et al. (2017). In addition, a small number of English comments were translated into Chinese by the author. Finally, 613 comments were extracted as sample data for this study. Subsequently, these extracted texts were used to analyze Big Five personality.

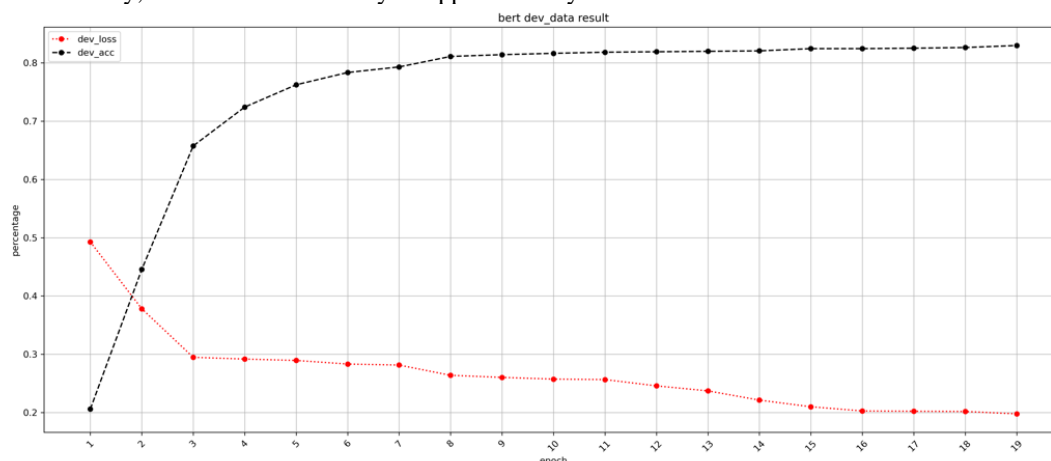
Model Construction

The BERT (Bidirectional Encoder Representations from Transformers) model is selected as the predictive analysis model for this study due to its excellent capabilities. BERT is a pre trained language model for training text dynamic word vectors based on Transformer, and its superiority has been proven in multiple natural language tasks.

The "Kaggle mypersonality" dataset (Artissa et al., 2019) served as the training data. During the process of building the model, the data in the dataset was labeled based on its original attributes. Subsequently, these data were converted into Json format and divided into a 30% validation and testing set and a 70% training set in specific proportions.

The use of BERT is divided into two stages: pre training and fine-tuning. BERT is trained in large corpora such as BooksCorpus and Wikipedia. Thus, the BERT model can more accurately capture the expression of word and sentence levels. In this study, researchers made minor adjustments to the BERT-base Chinese model proposed by Google to conduct a Big Five personality classification analysis on the text. After debugging, the text data collected on Taobao was put into the model for analysis and prediction results were generated.

During the process of building research models, prediction accuracy is one of the most important concerns. After 19 rounds of repeated training, the loss value of the model tended to stabilize. So the researchers used the model trained after the 19th round as the model for this study, which has an accuracy of approximately 0.8388.



Source: This study.

Figure 1: Results of 19 rounds of model training

After utilizing the BERT model for personality classification, the random forest model with the "sklearn" package (bootstrap method, sqrt max feature, digital estimator=200) was applied to predict specific scores for the five personality traits. These scores were then utilized to further explore the correlation between consumer personality inclinations and the number of likes received on comments.

The performance indicators of this model are shown in the table below, including R-squared (R^2), the mean squared error (MSE) provides insights into the predictive ability of each personality trait. According to the results, all 5 personality traits showed strong predictive ability, R^2 the value range is 0.855-0.861, indicating that approximately 85.5% -86.1% of the week variance can be explained by these traits. Most importantly, all these personality traits also exhibit relatively low MSE values, ranging from 0.050 to 0.103, indicating a small prediction error in the random forest model.

Table 1: Results of the random forest model

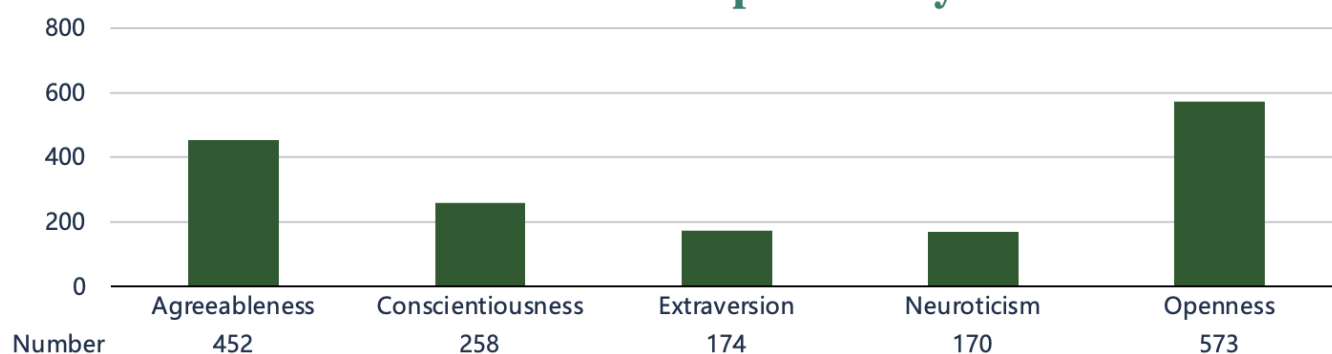
Indicators	Extraversion	Neuroticism	Agreeableness	Conscientiousness	Openness
R^2	0.861	0.856	0.861	0.857	0.855
MSE	0.103	0.083	0.064	0.078	0.050

Source: This study.

FINDINGS

The BERT model first labels every personality contained in consumer text. Each text contains more than one personality, with 2-3 common ones being labeled. In the first stage of analysis, a descriptive analysis was conducted to explore the personality distribution of online plant-based meat consumers.

Distribution of overall consumer personality



Source: This study.

Figure 2: The overall personality distribution of 613 consumers

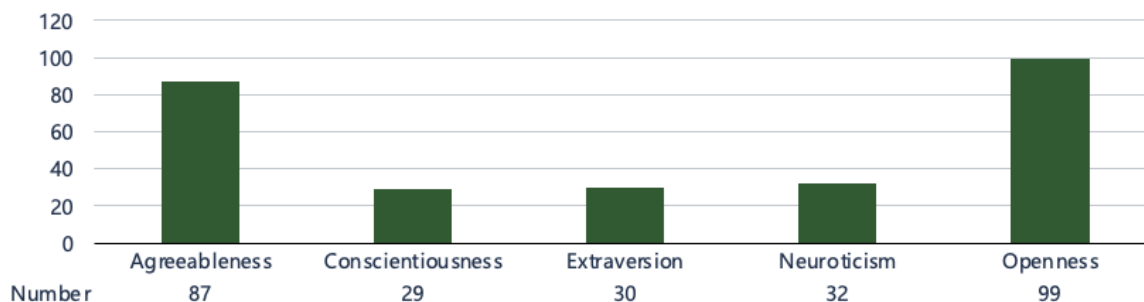
The data presented in the chart illustrates a notable prevalence of consumers exhibiting traits associated with openness among the 613 sampled individuals, surpassing those embodying other personality types. This outcome substantiates the validity of the first conjecture, affirming that extroverted consumers display a heightened inclination towards embracing novel products within the market. Conversely, individuals characterized by neuroticism represent the minority within the sample group. While constituting over 10% of the total sample size, this finding suggests that such consumers may harbor apprehensions regarding safety aspects pertaining to innovative food items. The second conjecture is not supported by the sample data. Particularly for emerging niche products, consumers embodying neurotic tendencies are likely to exercise greater caution in their purchasing decisions.

Beyond elucidating the overarching distribution of consumer personalities, delving into variances among consumers of distinct product categories proves to be a valuable endeavour. The sample dataset comprises reviews encompassing three distinct products: beef burgers (n=272) and pork and beef fried dumplings (n=107) from BEYOND MEAT as well as artificial pork jerky (n=234) from PLANT DIARY. Given disparities in sales volumes across establishments, delineating personality distributions with precision across these product categories is imperative for a comprehensive analysis.

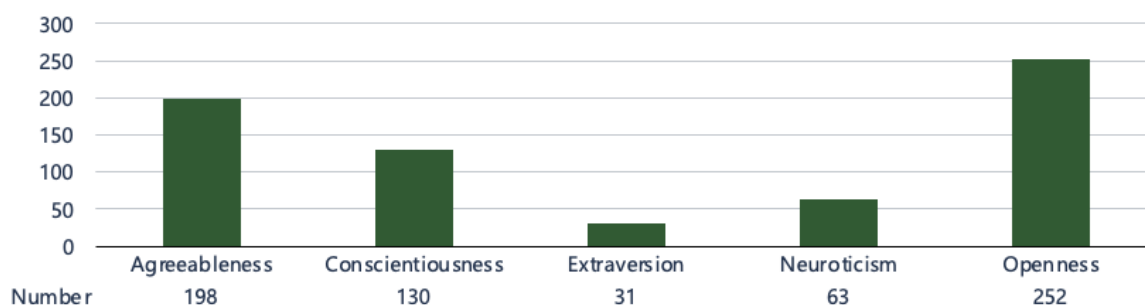
Across the spectrum of three distinct products, it is evident that consumers characterized by openness and agreeableness personality traits continue to constitute a substantial portion of the overall consumer base. Notably, it is observed that individuals embodying neuroticism and extraversion traits represent a comparably minor segment among the purchasers of these products. The trio of products under scrutiny encompasses varied plant-based meat ingredients and final products, thereby effectively mitigating individual bias stemming from personal food preferences.

From a detailed perspective, the consumer distribution of plant-based beef burgers differs from the overall results of the other two products. The main manifestation is that more consumers with agreeableness personality purchased this product, which exceeded consumers with openness personality.

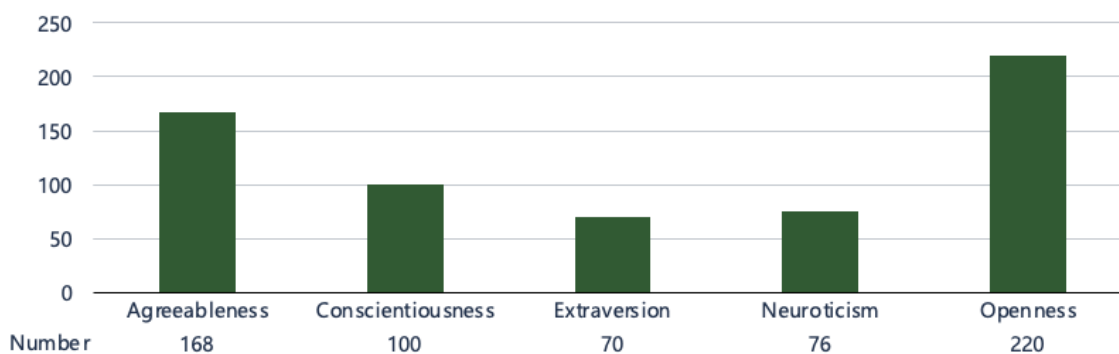
BEYOND MEAT's pork and beef fried dumplings Consumer personality distribution



BEYOND MEAT's Beef Burger Consumer personality distribution



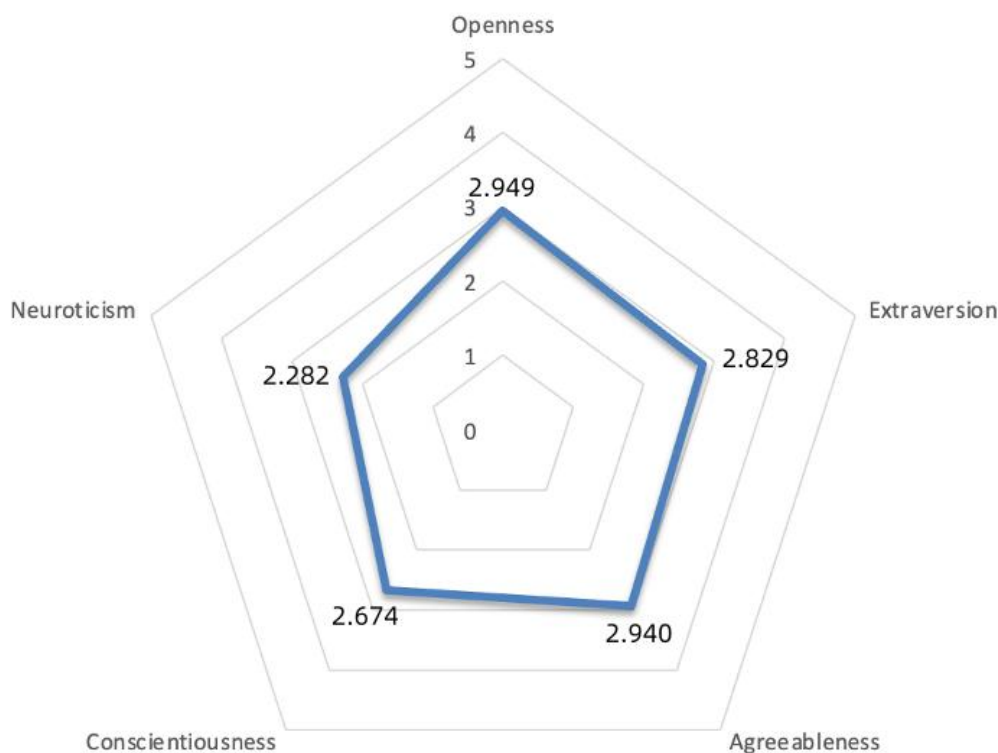
PLANT DIARY 's artificial pork jerky Consumer personality distribution



Source: This study.

Figure 2: Distribution of consumer personality for three different products

Using machine learning techniques, the five personality scores of each text are predicted. The average score of the sample is as follows, with an average value between 2.282 and 2.949.

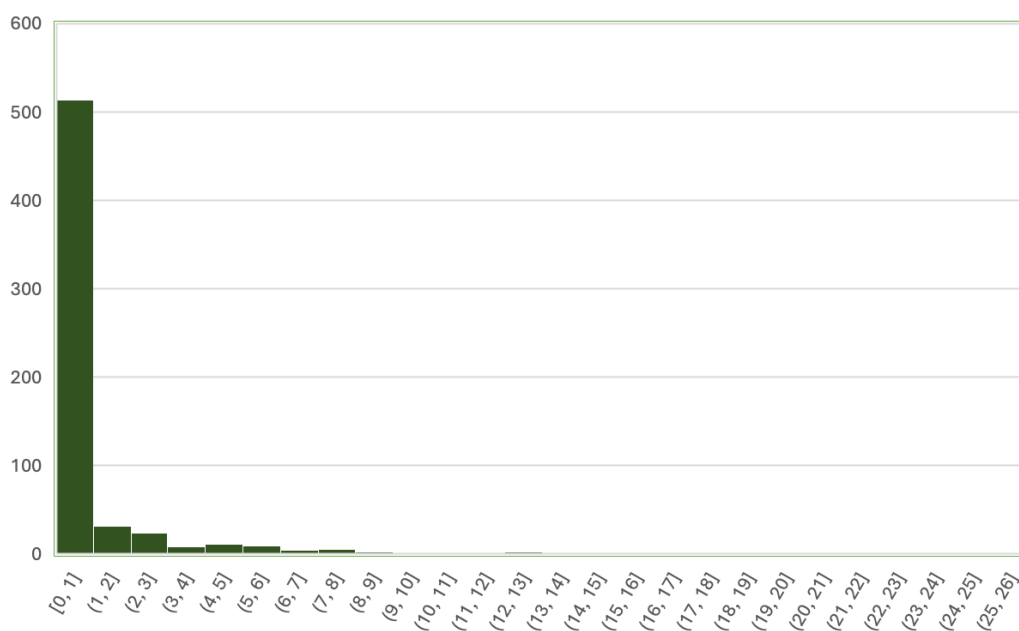


Source: This study.

Figure 3: The average score of each personality

By combining the specific score of each text with the number of likes received in the comments, the correlation between them can be viewed. Finally, the method of linear regression can effectively test the correlation between two variables. From the analysis results, the value of applying the model is not high. This may be due to the left-skewed distribution caused by many zero-like texts. According to the graphs and tables analyzed, the relationship between the score of extroversion personality and the number of likes of text was not strong. Although there was a slight positive correlation between them, it was not enough to support the third speculation.

The number of liked text statistics



Source: This study.

Figure 5: Distribution of number of likes

Non-standardized coefficient	Standardized coefficient	t	p
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	β	Standard error	Beta		
Constant	0.695	0.333	-	2.086	0.037
EXT_score	0.081	0.112	0.029	0.720	0.472
R^2	0.029				
Adjust R^2	0.001				

Dependent variable: the number of likes received in the comments.

DISCUSSION

The results of this study showed that consumers with openness and agreeableness were more likely to buy plant-based meat products, while the proportion of consumers with extraversion and neuroticism was relatively small compared with other personalities. Since there were too many comment texts that had not been liked, the third speculation cannot be effectively tested for the time being. Although the results showed a small positive relationship, the researchers didn't think it was enough to support them. In previous studies, most of the studies that analyzed the number of likes of posts were based on individual user accounts and content on social media (Hong et al., 2017). There is almost no literature on the narrow field of product review text likes, so this study fills the research gap in the field of green consumption and promotes the application of BERT model in the business field.

Moreover, in the personality classification model, researchers explored the application of machine learning and random forest techniques for predictive analytics. However, the presence of text datasets with varying lengths posed challenges, leading to potential imbalances in machine learning outcomes. Furthermore, many Chinese and foreign scholars, such as Dohaiha et al. (2019), have shown that the BERT model demonstrated superior prediction accuracy in text classification compared to alternative methods. Following a comparative analysis of the two models, researchers opted for the more robust BERT as our predictive model of choice. In contrast to conventional bidirectional semantic models, the BERT model leverages an attention mechanism instead of traditional recurrent neural networks and their derivatives. The integration of the attention mechanism serves to bolster the model's comprehension of the interrelations between individual words and their contextual significance. In this study, the labeling ability of comment text presented by BERT model was well reflected. Each text could be accurately classified into the Big Five personality categories according to the trained model. This also proved the feasibility of the BERT model in the research field of consumer behavior.

IMPLICATION

Theoretical Contribution

This paper deeply explores a new method in the field of green consumption research -- using big data and advanced artificial intelligence models to analyze the relationship between consumers' personality characteristics and green purchase decisions. The paper points out the shortcomings of previous studies that relied on questionnaires and proposes to use more objective online review data for research, which provides a new perspective and method for the field of green consumption research.

Moreover, the paper successfully applies the Bert model to the analysis of the personality characteristics of green consumers. As an advanced pre training language model, Bert model performs well in many natural language processing tasks. By fine-tuning the Bert model, this paper realizes the classification and analysis of the big five personality traits of green consumers and provides a new tool for the study of green consumers' personality traits.

In addition, the paper further explores the correlation between the personality tendency of green consumers and the number of likes received in reviews. By combining the random forest model, the paper predicts the specific scores of five personality traits and analyzes the relationship between these scores and the number of comments. This not only enriches the content of green consumer behavior research, but also provides more basis for understanding the psychology and behavior of green consumers.

The empirical results of this paper prove the effectiveness of the proposed method. The model used in this paper shows high accuracy in predicting the personality characteristics of green consumers and can explain most of the variance. This not only verifies the applicability of the Bert model in the study of green consumer behavior, but also provides strong support for subsequent research.

Practical Implications

The research results of this paper have practical commercial value. Understanding the Big Five personality traits of consumers can help green food companies more accurately grasp the psychological characteristics and behavioral patterns of the target market. Moreover, the research findings of this paper can help plant-based meat companies accurately locate customers who have already purchased plant-based meat, rather than universally applying personalized research on green consumers. This is more conducive for plant-based meat enterprises to make business management decisions based on consumer personality and make more suitable market positioning and demand matching.

The study of the Big Five personality traits of consumers can also provide inspiration for product innovation in green food companies. For example, for consumers with openness, companies can develop new green foods with unique flavors or functions. For Neurotics consumers, the company can launch products without food additives and packaging with food safety certification.

Having a deep understanding of consumer personality can help green food companies develop more effective marketing strategies. The company can choose appropriate promotional channels, promotion methods, and brand image shaping strategies based on the preferences and behavioral patterns of different consumer groups to improve market coverage and consumer loyalty. Studying the relationship between the Big Five personality traits of green consumers and plant-based meat has a significant promoting effect on the commercial value of plant-based companies. By gaining a deeper understanding of consumer personality, plant-based meat companies can better meet market demand, optimize product positioning, drive product innovation, and develop more effective marketing strategies, thereby standing out in a fiercely competitive market environment.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Despite the significant contribution of this study, a series of necessary observations on the limitations of the study is a must, which is understood as a starting point for further future work.

Firstly, the limited number of training sets poses a challenge. The diversity of label results, coupled with the insufficient size of the training set, hinders the effectiveness of the predictive model. With numerous permutations arising from five distinct personalities, it is recommended to include over 500 samples for each configuration within the training set to enhance prediction model accuracy. In this study, disparities in sample sizes across different categories within the training set led to diminished model precision. Although researchers implemented resampling techniques, the model's accuracy has yet to reach 90%.

Secondly, the study suffers from a constrained sample size. The niche market for plant-based meat products translates to a scarcity of prominent online retailers. With only 613 samples collected for this study, there exists an inadequacy in fully capturing consumer personality inclinations within this domain.

Lastly, a notable deficiency lies in the absence of image analysis methodologies. Some consumers express their opinions through a fusion of text and images—a facet overlooked in this study. Notably, academia boasts relatively advanced image-based personality prediction models (Azucar et al., 2018). The researchers observed that comments integrating text and images garnered more consumer engagement in terms of likes. It is hoped that future studies will delve deeper into this aspect.

In conclusion, despite the aforementioned limitations encountered during the research process, this study represents a bold endeavor to tackle business challenges utilizing BERT model. Moving forward, it is encouraged that scholars leverage more sophisticated technologies and expansive datasets for heightened accuracy in predictions and research endeavors.

CONCLUSION

In conclusion, this study deeply analyzed the intrinsic relationship between the five personality traits of consumers and the consumption of plant-based meat products, and significantly found a close correlation between green consumers with open personality traits and plant-based meat consumption behavior. We further conducted a detailed analysis of the five personality traits of consumers for different types of plant-based meat products, including plant-based beef burgers, plant-based pork, and plant-based beef fried dumplings, in order to help green food companies more accurately target their markets. This study not only enriches the theoretical framework of consumer behavior, but also provides a new perspective for understanding the operational mechanism of the green food market. This study innovatively adopted the BERT model to assist in the analysis of consumer Big Five personality classification, enriching practical methods in the business field. By utilizing sample data on green food consumption, this study fills the research gap on the five personality traits of green consumers, laying a solid foundation for the further development of green consumption behavior research, and has profound theoretical and practical significance.

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