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PERSONALITY & INDIVIDUAL DIFFERENCES | RESEARCH ARTICLE

The five factor model of personality as predictor of online shopping: Analyzing data from a large representative sample of Swedish internet users

John Magnus Roos^{1*} and Ali Kazemi²

Abstract: Using a large representative sample of the Swedish population, the present study aimed to explore the relationship between the Five Factor Model (FFM) of personality and frequency of online shopping. On three different occasions, surveys were sent out to 9,000 Swedish residents using a systematic random sampling procedure. In total, 5,238 individuals responded to the survey which, inter alia, included measures of the FFM of personality (i.e., HP5i, 15 items) and online shopping. A confirmatory factor analysis confirmed the construct validity of the HP5i. To examine whether and to what extent the FFM predicted self-reported frequency of online shopping, a hierarchical regression analysis was conducted in which gender and age were used as control variables. Our findings indicated that online shopping was positively associated with Openness to experience (i.e., openness to feelings) and Extraversion (i.e., hedonic capacity), and negatively associated with Conscientiousness (i.e., a high degree of impulsiveness). These results suggest that online shoppers are affective, hedonic, and impulsive; that is, characteristics that contrast with the classical view of online shoppers as cognitive, utilitarian, and goal-directed. We argue that these results, alongside the use of a large representative sample and frequency of online purchase, are a needed addition to previous research as previous research

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PUBLIC INTEREST STATEMENT

Based on a large representative sample of the Swedish population, the present study shows that online shoppers primarily are affective, impulsive, and hedonic in personality profile. This suggests that the traditional view of the typical online shopper as primarily utilitarian and goal-directed (emphasizing control and trust) seems to be a too-simplistic understanding of online shoppers, and that online shopping foremost is driven by pleasure. In light of these findings, we suggest that online retailers focus on delivering joyful experiences that match the personality profile of online shoppers. Implications should also be discussed from a societal point of view in terms of what is a sustainable model in the long run. Thus, if e-commerce is designed to further increase the purchase frequencies of the consumers who already shop mostly online, it can drive problematic online shopping behavior such as indebtedness, compulsive buying and unsustainable ecological development.

studies mainly have focused on the intention or motivation to online shopping using smaller non-representative samples. Implications for online retailers and society as well as directions for future research are discussed.

Subjects: Behavioral Sciences;; Psychological Science;; Business, Management and Accounting;;

Keywords: personality; five factor model; FFM; HP5i; online buying; online shopping; hedonic; utilitarian; goal-directed; experiential

1. Introduction

Online shopping has become increasingly popular around the world, largely due to the convenience associated with online shopping and the increasing coverage of online products and services and not least the pandemic and the restrictions in its wake (Song & Sun, 2020). In Sweden, during the past decade, e-commerce sales have increased by almost 400% (PostNord, 2021), and the number of times that Swedes shop online has more than doubled (Roos, 2020).

Given the increasing popularity of e-commerce, much research effort has been put into understanding the role of external factors (e.g., market communication and web design) and internal factors (e.g., personality) in deciding whether to shop online or not (Mothersbaugh et al., 2020). In this research, we focus on the latter and specifically pose the question as how and to what extent personality traits might predict the frequency of online shopping.

While there are many theories of personality, those found to be most useful in the context of marketing and consumer psychology are the so-called trait theories (Mothersbaugh et al., 2020). Trait theories examine personality as an individual difference variable and thus allow marketers to segment consumers as a function of their personality differences. Trait theories assume that all individuals have internal characteristics related to action tendencies and that there are consistent and measurable differences between individuals on those characteristics. One of the more well-known multi-trait theories is the Five-Factor Model (FFM). The FFM of personality proposes a set of five broad trait dimensions, formed by genetics and early learning, referred to as the “Big Five”: Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism (Goldberg, 1990). The advantage of using a multi-trait personality theory such as the FFM, compared to single-trait theories often employed in the marketing literature, lies in its recognition of the complexity in understanding determinants of human behavior (Mothersbaugh et al., 2020). Simply, multi-trait personality theories provide a more comprehensive view of people’s behavior and thus the more we know, the better online retailers can provide services and design their websites to satisfy the multiple needs of consumers.

The FFM has proven useful in a variety of areas relevant to consumer behavior and marketing, such as understanding bargaining behavior (Harris & Mowen, 2001), compulsive buying (Andreassen et al., 2013), and how different value propositions are evaluated (Larson & Sachau, 2009). In e-commerce, the FFM has explained individual differences in perceptions of marketing communication; for instance, marketing communication messages that match how people think about themselves are more persuasive (Wheeler et al., 2005; see also, Lee et al., 2017; Winter et al., 2021), information search and processing involving comparing and evaluating alternatives (Tan & Tang, 2013), engagement in various marketing activities such as brand communities (Islam et al., 2017), sharing ads on social media platforms (Kulkarni et al., 2019; Lee et al., 2017), and writing online reviews (Picazo-Vela et al., 2010) just to mention a few examples. This research has thus focused on segmenting markets for more effective communication and for gaining increased control over how information is disseminated. Another area of use has been to construct data-driven models to predict consumption of

specific product categories (Huang et al., 2020; Liu et al., 2019). In this research, personality has often been combined with other psychographic measurements and digital tracks of actual behaviors from several online platforms. The results from this research area have revealed mixed results concerning the FFM, and the contribution of specific traits are not always reported in this line of research.

In the context of examining the relationship between the FFM and overall online shopping, previous research is very limited. The studies that have been carried out are either old (Bosnjak et al., 2006; Huang & Yang, 2010; McElroy et al., 2007) or have been carried out in a developing country with relatively low internet penetration rate (i.e., the internet penetration rate corresponds to the percentage of the total population of a given country or region that uses the internet; Iqbal et al., 2021). Previous studies have further focused on the intention to shop online (Bosnjak et al., 2006; Iqbal et al., 2021; McElroy et al., 2007) and the motivation to shop online (Bosnjak et al., 2006; Huang & Yang, 2010) rather than factual previous or current shopping behavior. There are also some shortcomings in previous studies in that they have not used large or representative samples of the larger general population. For instance, Huang and Yang (2010) and McElroy et al. (2007) analyzed data collected from university students. Online shopping varies by life experience and income and may thus show a very different pattern for those who have not studied at university (Song & Sun, 2020). Also, Bosnjak et al. (2006) and Iqbal et al. (2021) relied on rather homogeneous samples, biased toward male and younger populations. These non-representative samples used in previous studies predicting online shopping utilizing the FFM of personality make it difficult to generalize the results to a broader population beyond the scope of the population from which the samples were drawn. In support of this view, Huang and Yang (2010) remind us that “future researchers could select other, more representative, samples to improve the generalizability of findings” (p. 678). Thus, to remedy the shortcomings in previous research, in the present study, we predict frequency of online shopping as reported by research participants using a large representative sample, randomly drawn from the Swedish population, covering citizens between 16 and 85 years of age, also having in mind that Sweden has a relatively high internet penetration rate. Specifically, the research gap the present study aims to address is how and to what extent the FFM of personality accounts for variations in whether people have shopped online rather than predicting future intention or motivation to purchase online as has been the case in previous studies (e.g., Bosnjak et al., 2006; Huang & Yang, 2010; Iqbal et al., 2021; McElroy et al., 2007).

The remainder of the paper is organized as follows. First, we provide a brief text discussing perspectives on online shopping. In the section that follows, we describe the tenets of the FFM of personality. Next, we review previous research on the FFM and online shopping and formulate the hypotheses the present study set out to investigate. The methods and the results are presented next. Finally, we discuss our results in light of previous findings and reflect upon practical implications of our findings.

1.1. Perspectives on online shopping

Although the purpose of this study was not to examine motives behind online shopping, considering two major groups of motives (i.e., utilitarian vs hedonic) discussed in the literature help contextualizing the present study. In other words, the research on motives behind online shopping helps us understanding the effects of personality on online shopping.

Online shopping has traditionally been associated with utilitarian rather than hedonic motives (Laudon & Traver, 2020; Wolfinbarger & Gilly, 2001). Utilitarian shopping has been described as task- and transaction oriented, efficient, and goal-directed and is perceived more as a work-activity, whereas hedonic shopping has been described as joyful, fun, and experiential and is perceived more as a leisure activity (Chitturi et al., 2008; Thompson et al., 1990). According to Wolfinbarger

and Gilly (2001), there are at least four reasons behind online shoppers being more utilitarian and goal-directed than hedonic and experiential: (1) convenience and accessibility (i.e., when online alternatives for products you are interested in are accessible, online shopping is seen as more convenient and saves the online shopper time and effort both physically and mentally); (2) selection (i.e., choosing the right product to meet personal needs in the enormous supply implying a rational and “better” choice of products the online shopper is interested in); (3) information availability (i.e., availability of information for searching and comparing alternatives prior to purchase as “everything” is gathered in one place or a click away, and this gives the online shopper a better overview of the same products than in physical stores); and (4) absence of distracting elements (e.g., in-store marketing, sales people, other customers).

The view that online shopping mainly serves utilitarian motives and goals, and physical shopping is mainly related to hedonic goals, has however been shown to be a too-limited perspective and has therefore come to be challenged by a complimentary view stating that online shopping may also be triggered by enjoyment and pleasure rather than by utilitarian needs (Kim & Eastin, 2011). Goldsmith and Goldsmith (2002) mentions that the personality traits associated with online shopping might be related more to the hedonic (e.g., extraversion) rather than the utilitarian kind of shopping. This draws the attention to the importance of personality in the context of online shopping and may challenge and nuance the traditionally one-sided perspective on online shopping as primarily serving utilitarian goals (e.g., achievement, efficiency).

1.2. The five factor model of personality

Individuals have fairly consistent patterns of responses to the world of stimuli surrounding them. These generalized patterns of response behavior reflect one’s personality (Kassarjian, 1971). Personality psychologists conceptualize personality in terms of five broad factors: Openness to experience, Conscientiousness, Extraversion, Agreeableness and Neuroticism (Costa & McCrae, 1992). Personality traits have been proven to be related to many activities including internet usage (Hamburger & Ben-Artzi, 2000; Mark & Ganzach, 2014; Roos & Kazemi, 2018) and shopping behavior (Roos & Holmberg, 2012).

According to Costa and McCrae (1992), Openness to experience is reflected in individuals’ curiosity, adventurousness, and openness to new experiences. Openness to experience moreover refers to being open to feelings, change and variety, and being intellectually oriented. Such individuals often have many hobbies and diverse interests. People high in Openness to experience are usually creative and innovative, whereas people low in Openness to experience tend to be more conservative and restricted. Openness to experience has been differently operationalized in various personality inventories.

Conscientiousness refers to the propensity for planning and seeking high achievement. Individuals high in this trait have a strong sense of purpose, are self-disciplined, efficient, organized, deliberative, methodical in daily routines, and achievement- and goal-oriented (Costa & McCrae, 1992). People low in Conscientiousness, in contrast, tend to be more impulsive, lazy, and give up more easily.

Extraversion is related to being motivated by external stimuli, for instance, to people, objects, or environments. Individuals high in Extraversion are more driven to seek stimulation and enjoyment. According to Eysenck (1990), sociability is the core of Extraversion, while other researchers view hedonic capacity (positive emotions) as the core element of Extraversion (Gustavsson et al., 2003; Tellegen, 1985; Watson & Clark, 1997).

Agreeableness (also known as sociability) refers to friendly, considerate, and modest behavior. People high in Agreeableness are caring, friendly, warm, and tolerant and have a general predisposition for prosocial behavior (Chamorro-Premuzic, 2012). Individuals high in Agreeableness also tend to trust rather than being suspicious of other people. People low in Agreeableness are suspicious and less concerned about other people than their more agreeable counterparts.

People high in Neuroticism usually express negative emotions when they are in stressful situations (Costa & McCrae, 1992). Neuroticism is the tendency to feel guilty, depressed, and anxious. A high degree of Neuroticism is related to negative affect (e.g., pessimism) and to negative basic emotions such as anger, disgust, fear, and sadness (Digman, 1990; Roos, 2014).

1.3. Previous research on the FFM of personality and online shopping

According to Huang and Yang (2010), Openness to experience is positively related to online shopping for at least two reasons. Firstly, people high in this trait view online shopping as an adventure and shop online for the purpose of stimulation and excitement and to encounter something novel and interesting while shopping. Secondly, people high in Openness to experience shop online in order to discover new trends. The positive relationship between Openness to experience and online shopping has been confirmed in several studies (e.g., Bosnjak et al., 2006; Iqbal et al., 2021; McElroy et al., 2007). Thus, in line with previous research, we propose that:

Hypothesis 1: Openness to experience is positively related to online shopping.

According to Wolfinbarger and Gilly (2001), people high in Conscientiousness are more likely to shop online because internet shopping takes place in a comfortable and less stressful environment and is convenient in terms of minimizing efforts and for saving time compared to brick-and-mortar stores. Such circumstances appeal to and match their self-controlled, well-organized, and efficient personalities. This was confirmed in a recently published empirical study by Iqbal et al. (2021). Considering these results, we propose that:

Hypothesis 2: Conscientiousness is positively related to online shopping.

Iqbal et al. (2021), found a positive relation between Extraversion and online shopping, while other studies (i.e., Bosnjak et al., 2006; McElroy et al., 2007) found no such relationship. People high in Extraversion are socially motivated to engage in online shopping activities, such as sharing ads and shopping information on social media platforms (Huang & Yang, 2010; Kulkarni et al., 2019). Individuals high in Extraversion are also more involved in brand communities (Chang et al., 2013; Islam et al., 2017), which, however, primarily is explained by their need for activity rather than their need for socializing (Chang et al., 2013). Based on previous research, people high in Extraversion are more involved in activities related to e-commerce in general and, according to Iqbal et al. (2021), also to online shopping. Therefore, we propose that:

Hypothesis 3: Extraversion is positively related to online shopping.

Previous research on the relationship between Agreeableness and online shopping is inconclusive; that is, there is evidence in support of both positive and negative associations. One the one hand, Bosnjak et al. (2006) have found that Agreeableness is negatively related to online shopping. People high in Agreeableness display a stronger need to uphold interpersonal relationships, which might motivate them to visit brick-and-mortar stores rather than online stores (Wolfinbarger & Gilly, 2001).

One aspect of the utilitarian perspective of online shopping is the lack of sociability. As Agreeableness also is known as sociability, the argument is that people low in this trait buy more online because they do not want to socialize with the salespeople and other consumers in a brick-and-mortar store.

On the other hand, Iqbal et al. (2021) found that people high in Agreeableness are more likely to shop online because they have a high level of technology acceptance and are positive about using new information channels and applications facilitating the execution of daily tasks (e.g., shopping). Another reason for the positive relationship between Agreeableness and online shopping intentions is that people high in Agreeableness have more confidence in e-commerce and online transactions compared to their less agreeable counterparts (Iqbal et al., 2021).

In sum, sociability and trust are facets of Agreeableness (Chamorro-premuzic, 2012). A positive relationship between Agreeableness and online shopping could be motivated by trust in e-commerce, while a negative relationship could be motivated by the difficulty of socializing compared to brick-and-mortar stores. The contradictory nature of previous results and the convincing theoretical reasoning in support of each make it difficult for us to put one way of reasoning before the other. Thus, we simply propose that:

Hypothesis 4: Agreeableness is significantly related to online shopping.

Previous research results concerning the association between Neuroticism and online shopping are also contradictory; that is, there is evidence in support of both positive and negative associations. One line of research shows that Neuroticism is positively related to online shopping (McElroy et al., 2007). Online shopping may be instrumental to mood-regulation among people high in Neuroticism; that is, shopping opportunities are always available and people high in Neuroticism engage in online shopping to temporarily feel better (LaRose & Eastin, 2002).

There are other research studies which, in contrast, report that Neuroticism is negatively related to online shopping (e.g., Bosnjak et al., 2006; Iqbal et al., 2021). This line of research shows that people high in Neuroticism are more concerned and anxious about sharing information online and performing digital transactions. According to Iqbal et al. (2021), neuroticism is positively associated with computer anxiety and people high in Neuroticism therefore perceive online shopping as more stressful and threatening than their more emotionally stable counterparts.

The contradictory nature of previous results and the convincing theoretical reasoning in support of each show that Neuroticism can both stimulate and inhibit online shopping, and this makes it difficult for us to put one interpretation before the other. Thus, we simply propose that:

Hypothesis 5: Neuroticism is significantly related to online shopping.

2. Methods

2.1. Participants and design

Every autumn since 1986, the SOM (acronym for Society, Opinion and Media) Institute at the University of Gothenburg has been conducting a national survey to map the Swedish public's habits and attitudes in various aspects of life. Data are collected via postal surveys, and surveys are conducted under as identical conditions as possible so that the results from the different years are comparable. The surveys are based on a nationally representative systematic random sample of persons between 16 and 85 years of age.

During the period 2010–2013, three independent surveys, which included questions about personality traits and internet habits (e.g., online shopping), were conducted on 3,000 people each. Thus, the empirical material for the present study consists of data collected on three different occasions: Sample 1 (N = 3000), data collected between 17 September 2010 and 15 February 2011 (Nilsson & Vernersdotter, 2011); Sample 2 (N = 3000), data collected between 9 September 2011 and 13 February 2012 (Vernersdotter, 2012); Sample 3 (N = 3000), data collected between 14 September 2012 and 21 February 2013 (Vernersdotter, 2013). To summarize, a postal questionnaire was sent out to 9,000 randomly chosen Swedish citizens in the age range of 16 to 85 between 24 September 2010 and 21 February 2013. In total, 5,238 individuals responded to the survey (an aggregated response rate of 58 percent) which included measures of the FFM, online shopping, age, and gender.

2.2. Measures

2.2.1. Online shopping

Online shopping was measured with a single item: “How often did you buy a product or service online during the past twelve months?” The respondents were asked to indicate frequency of online shopping on a seven-point Likert scale ranging from 1 (“never”) to 7 (“every day”).

2.2.2. The five factor model of personality

The FFM was measured by HP5i, a 15-item version of the FFM developed by Gustavsson et al. (2003). Three items assessed each specific factor. A four-point Likert scale ranging from 1 (“strongly disagree”) to 4 (“strongly agree”) was used for all subscales. The HP5i has shown satisfactory levels of construct, convergent and discriminant validity as well as test-retest reliability (Gunnarsson et al., 2015; Gustavsson et al., 2003). Gustavsson et al. (2003) reported a range

Table 1. An overview of the FFM factors, the facets of HP5i and the measurement items

FFM factor	HP5i facet	Definition of facet	Survey items
Openness	Alexithymia	Not open to feelings	O1. Don't analyze my feelings (R) O2. Emotions are exaggerated (R) O3. Don't understand others' feelings (R)
Conscientiousness	Impulsivity	Non-planning behavior	C1. Act on the spur of the moment (R) C2. Throw myself too hastily into things(R) C3. Talk before I think (R)
Extraversion	Hedonic capacity	Positive emotions	E1. Often feel exhilarated E2. Enjoy life E3. In good mood when socialize
Agreeableness	Antagonism	Hostility in interpersonal relations	A1. Makes sarcastic commentaries (R) A2. If treated badly, I think one should give back (R) A3. Coming up with piercing and malicious answers (R)
Neuroticism	Negative affectivity	Negative emotions and stress symptoms	N1. Often feel uncomfortable and ill at ease N2. Feel pressure when urged to speed up N3. Muscles so tense that I get tired

Note. A four-point Likert scale ranging from 1 (“strongly disagree”) to 4 (“strongly agree”) was used for all items. All items marked by (R) were reversed to ensure that all were in the same direction, that is, that high responses on items indicate high values on underlying personality factor.

of 0.54 to 0.76 ($M = 0.66$) in internal consistency in terms of the Cronbach alpha coefficient for the five subscales of the FFM. In the present study, the Cronbach alpha coefficients ranged from 0.61 to 0.74.

The HP5i scale uses alexithymia/openness to feelings as a facet of Openness to experience, impulsiveness as a facet of Conscientiousness, hedonic capacity as a facet of Extraversion, antagonism as a facet of Agreeableness, and negative affectivity as a facet of Neuroticism. Example items were: “don’t analyze my feelings” (phrased as the opposite of Openness to experience), “act on the spur of the moment” (phrased as the opposite of Conscientiousness), “often feel exhilarated” (Extraversion), “makes sarcastic comments” (phrased as the opposite of Agreeableness) and “often feel uncomfortable and ill at ease” (Neuroticism; see, [Table 1](#) for an overview of the factors, facets and included items; Gustavsson et al., 2003). For the sake of clarity, we describe these five facets briefly in the following.

Individuals high in alexithymia have difficulties with experiencing and expressing emotions (Haviland & Reise, 1996). They are non-emotional and focus on concrete and factual occurrences (Weinby, 1995). The alexithymia scale used in the present study assesses devaluation of feelings and a lack of interest to understand and to talk about emotions. The alexithymia scale captures the lower end of Openness to experience and has been shown to correlate with the “openness to feeling” facet of the Openness to experience factor.

An impulsive individual takes life easy and the day as it comes instead of planning. S/he is careless and sloppy and takes risks in different aspects of everyday life. Such a person is not thoughtful, reliable, or careful. Impulsiveness can be divided into motor impulsiveness (acting without thinking), non-planning impulsiveness (living for the moment—as opposed to being goal-directed) and cognitive impulsiveness (making up one’s mind quickly; Barratt, 1985). The impulsiveness scale used here is delimited to motor-impulsiveness and non-planning impulsiveness. The scale assesses the lower end of Conscientiousness.

The scale of hedonic capacity assesses positive affect—the capability to experience positive emotions in life. People high in hedonic capacity are more excited, enthusiastic and engaged than people lower in hedonic capacity (Meehl, 1975). The hedonic capacity scale assesses Extraversion, in particular the facet of positive emotions.

In line with Gustavsson et al. (2003), we define antagonism as expressive hostility which includes revenge, uncooperativeness, rudeness, and cynicism. Specifically, the scale of antagonism in the present study reflects expressive hostility in interpersonal relations. The antagonism scale assesses the lower end of Agreeableness.

We define negative affectivity as proneness to nervous tension and distress (including tenseness, distractibility, fatigability, emotional arousal, uneasiness, anxiety, and diffuse stress). The scale of negative affectivity used herein reflects a susceptibility to negative emotions and stress symptoms. The negative affectivity scale assessed the Neuroticism factors, especially the facets of anxiety and vulnerability. A complete overview of the questionnaires is available via the SOM Institute’s website (www.som.gu.se) and in the methods section for each survey (see, Nilsson & Vernersdotter, 2011; Vernersdotter, 2012, 2013).

2.2.3. Control variables

Prior research has found that both gender and age influence online shopping; that is, women shop more online than men, and younger people shop more online than older people (Kircaburun & Griffiths, 2018; Laudon & Traver, 2020; PostNord, 2020; Song & Sun, 2020). Personality theorists have also found

that gender and age influence the FFM (Schmitt et al., 2017; Soto et al., 2011). Therefore, the respondents' age and gender were used as control variables in the present study. Gender was dummy-coded; male was coded as 1 and female as 0. Age was measured through an open-ended question.

2.2.4. Statistical analyses

Confirmatory factor analysis (CFA) was used to investigate the construct validity of the HP5i. The 15 items were fit into a five-factor confirmatory factor analytic model using the R library lavaan version 0.6–7 (Rosseel, 2012). The model was fit using maximum likelihood estimation which assumes a continuous latent variable and continuous indicators. This is defensible when items have five or more response categories (Rhemtulla et al., 2012).

Composite measures were constructed for all personality facets by averaging responses to the items of each subscale. Only respondents who had answered all three items received a mean score for that specific factor and were thereby included in the analyses. All reverse-coded items were reversed in such a way that a high score represented a high degree of the personality factor.

To test the hypotheses, a hierarchical regression analysis in three steps with online shopping as the dependent variable and the personality factors, gender and age as independent variables was conducted. Gender and age were entered as controls in two different steps, i.e., step 2 and step 3 respectively, to control for their effects separately and to obtain measures of incremental explained variance.

3. Results

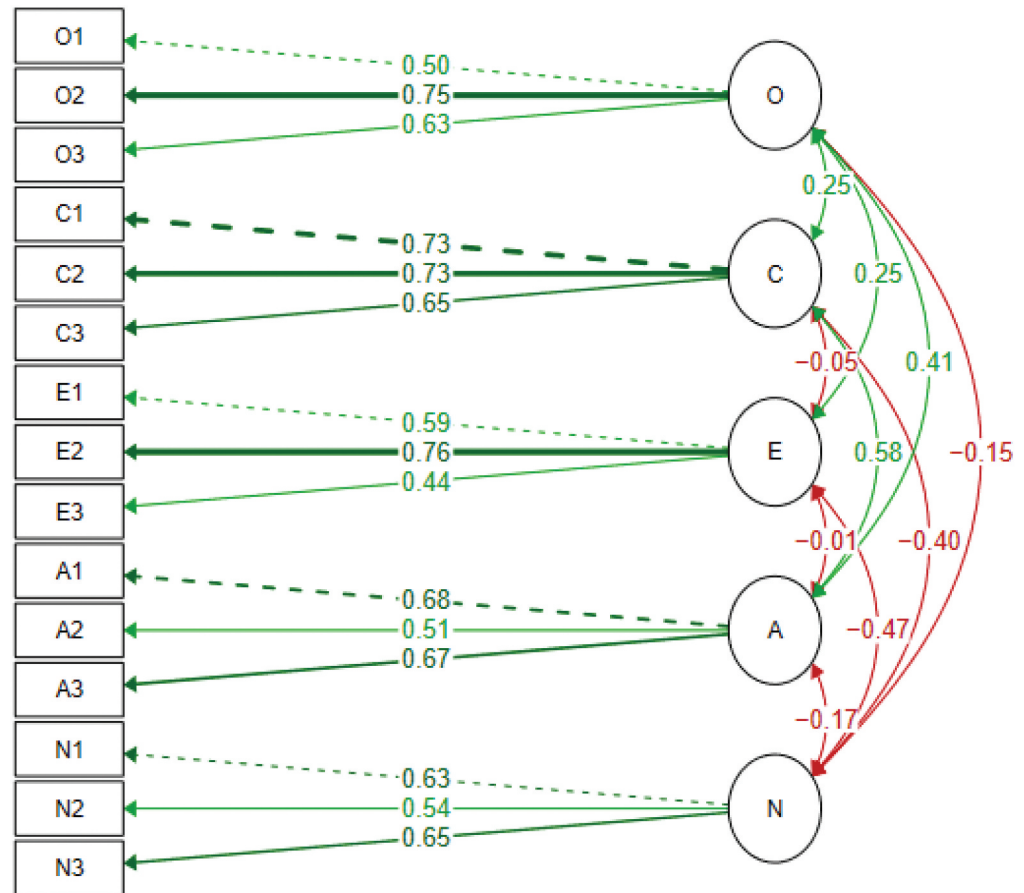
Responses from 4,885 participants (2,290 men and 2,595 women) were analyzed. Only participants who had used the internet during the past 12 months (87.5% of the participants) were included in the analyses. The age of the participants (i.e., internet users) ranged from 16 to 85 with a mean of 48 years. Among the internet users, 4,160 people completed the online shopping question. Among them, 22.1% had not bought anything online during the past 12 months; 13.7% had bought something online once during the past 12 months; 29.0% had bought something in the past six months; 29.8% had bought something every month, 3.9% had bought something every week, 0.8% had bought something several times a week and 0.7% had bought something online on a daily basis.

Table 2 contains means, standard deviations, Pearson correlations, and internal consistency in terms of Cronbach's alpha coefficient for each personality factor.

The CFA confirmed the dimensionality of the HP5i (see **Figure 1**). Model fit was Satorra-Bentler $\chi^2(80) = 799.30$, $p < .001$, TLI = .912, CFI = .933, RMSEA = .050 (90% CI [.047, .053]), SRMR = .042. While this model would be rejected under the traditional test of exact fit (i.e., χ^2), it is well known that in large samples, even trivial misspecifications result in deviations large enough for the model to be rejected (Hopwood & Donnellan, 2010).

A hierarchical regression analysis was used to investigate to what extent the five personality factors predicted the frequency of purchasing products and/or services online. The FFM was significantly associated with the frequency of online shopping and accounted for 2.7% of the total variance in online shopping (**Table 3**). The statistically significant personality predictors of online shopping were Openness to experience, Extraversion, Conscientiousness and Agreeableness. Gender did not alter these associations in step 2. In step 3, when age was added, the regression model accounted for 14.7% of the total variance in online shopping. Openness to experience, Conscientiousness and Extraversion remained statistically significant although the numerical size of their respective beta weights was reduced,

Figure 1. Measurement model of the HP5i: results from a confirmatory factor analysis. In this analysis data from all respondents were included, also non-users of the internet. The items are given in [Table 1](#).



whereas the beta weight of Agreeableness turned to being statistically nonsignificant. In sum, these results provided support for Hypothesis 1 (Openness to experience as positively related to online shopping) and Hypothesis 3 (Extraversion as positively related to online shopping). Hypothesis 4 (Agreeableness as significantly related to online shopping) was partially supported as the negative association turned to being nonsignificant after controlling for age. Hypothesis 2 predicting that Conscientiousness is positively related to online shopping was not supported as the analysis revealed that this association was negatively signed. Finally, Hypothesis 5 was not confirmed as Neuroticism was shown to be unrelated to online shopping.

4. Discussion

The present study set out to investigate how personality traits are related to online shopping by using a rather large and representative sample of the Swedish population. The results revealed some interesting findings. We will comment on the findings pertaining to each hypothesis in the following.

Hypothesis 1 predicted a positive association between Openness to experience and online shopping and was supported. This finding was in line with previous research (Bosnjak et al., 2006; Iqbal et al.,

Table 2. Means, standard deviation, reliability, and correlation coefficients for the study variables

	M	SD	α	1	2	3	4	5	6
1. Openness	3.06	0.58	.66						
2. Conscientiousness	2.97	0.61	.74	.18**					
3. Extraversion	3.12	0.48	.61	.18**	-.03				
4. Agreeableness	2.81	0.64	.64	.32**	.38**	.02			
5. Neuroticism	2.19	0.64	.63	-.05**	-.28**	-.26**	-.10**		
6. Age	48.00	17.05		-.10**	.14**	-.06**	.14**	-.06	
7. Online shopping	2.85	1.28		.10**	-.07**	.09**	-.06**	-.03	-.37**

Note. α = Cronbach's alpha coefficients for the personality factors. Personality factors, HP5i (response scale 1–4). Age (open-ended question, observed range 16–85 years). E-shopping (response scale 1–7). The question for e-shopping was “How many times have you bought products and/or services online during the past 12 months”. Response scale: 1 = never, 2 = once in the last 12 months, 3 = once in the last 6 months, 4 = every month, 5 = every week, 6 = several times a week, 7 = every day. Frequency of online shopping refers to the mean value on the seven-point scale. * $p < .05$; ** $p < .01$. Only internet users were included in the correlation analysis.

2021; McElroy et al., 2007). People high in Openness to experience enjoy shopping online because online shopping offers them adventure, variety, and new ideas (Huang & Yang, 2010).

Hypothesis 2, predicting that Conscientiousness is positively related to online shopping, following the theorizing of Wolfinbarger and Gilly (2001), was not confirmed. Instead, our findings showed that Conscientiousness is negatively related to online shopping. In other words, individuals higher in impulsiveness are shopping more frequently online as compared to individuals lower in impulsiveness. This may suggest that the impulsiveness quality in online shoppers has been underestimated in the previous research where the focus rather has been on goal-directedness in online buyers, fueled by achievement-striving, self-discipline, and deliberation (Wolfinbarger & Gilly, 2001). A pioneer study (Donthu & Garcia, 1999) found that online shoppers are more impulsive than brick-and-mortar shoppers. However, the study was criticized for limitation in its research design (Bosnjak et al., 2006). Our nationally representative study confirms the early findings of Donthu and Garcia (1999) and suggests that impulsiveness should be considered as a key personality trait in e-commerce and that this facet of Conscientiousness deserves more attention in future research studies. So-called impulsive buying is a well-studied phenomenon in brick-and-mortar stores and previous research shows that a low degree of Conscientiousness is associated with impulsive buying (Thompson & Prendergast, 2015). According to Zhu et al. (2012), novelty and fashion are stimulating impulsiveness even more in online shopping compared to purchases made in brick-and-mortar stores.

A tenable explanation for why our finding in this regard countered the one proposed by Wolfinbarger and Gilly (2001) and shown by Iqbal et al. (2021) is that their studies date back to a time when the internet penetration rate was not as high as it currently is, especially in developed countries. As such, it was not an indispensable part of people's everyday lives, and various applications making online shopping easier, in particular for impulsive buyers, were not available. The study by Iqbal et al. (2021) was conducted in Pakistan, a developing country with an internet penetration rate of 21% compared to the internet penetration rate of 90% in Sweden where the present study was conducted. Although the internet and e-commerce worldwide have developed considerably during the last two decades and hence the possibilities for digital marketing, this may not be the case in some developing countries. Compared to developing countries, consumers in developed countries enjoy a higher internet penetration rate and are more exposed to digital market stimuli (e.g., advertising, offerings) which might explain why impulsive people may resist less and therefore tend more often to shop online. There are several recent studies that have found positive relationships between impulsivity and online shopping in developed countries (Himawari et al., 2018). One of the main motives for shopping online is “the information availability motive”. Previous research has in

Table 3. Hierarchical regression models exploring how personality factors predict online shopping frequency controlling for gender (Step 2) and age (Step 3)

Independent Variables	Step 1: Personality B	Step 2: Personality, Gender B	Step 3: Personality, Gender, Age B
Openness	.122***	.134***	.081***
Conscientiousness	-.070***	-.072***	-.042*
Extraversion	.060***	.064***	.051**
Agreeableness	-.083***	-.072***	-.015
Neuroticism	-.023	-.013	-.026
Gender		.044*	.061***
Age		.	-.355***
AdjR ²	.027***	.028***	.147***

Note. B = Beta, standardized regression coefficient. * p<.05; ** p<.01; ***p<.001. Only internet users were included.

this regard shown that people high in Conscientiousness more often seek information online and compare different alternatives more carefully than people lower in Conscientiousness (Tan & Tang, 2013). Although the steps preceding the final act of purchase (e.g., searching information about a certain product) would suggest that online shopping is primarily appealing to people high in Conscientiousness, our results show that it is people low in Conscientiousness who buy most frequently online. This is interesting and leads us into another possible explanation for why the present finding contradicts the findings of Iqbal et al. (2021). Iqbal et al. (2021), like many other researchers in the field, examined intentions to shop online while we asked our participants about actual purchases. It is likely that Conscientiousness is positively related to the *intention* to shop online, but negatively related to online shopping (i.e., factual purchase online). The differential patterns of association between intention and behavior in the context of online shopping and (lower levels of) Conscientiousness could thus simply be explained by impulsivity in online shoppers; that is, shoppers who are not able to resist immediate temptations to buy—despite the lack of any previous intention of buying—as they shop more for hedonic reasons compared to their more conscientious counterparts. The relationship between Conscientiousness and online shopping is an intricate one and obviously needs to be further investigated in future studies.

In line with Hypothesis 3, the results showed that individuals high in Extraversion buy products and services more frequently online. This finding corroborates previous research (e.g., Chang et al., 2013; Huang & Yang, 2010). The effect of positive emotions (e.g., pleasure, enjoyment) of online shopping goes beyond the facet of Extraversion related to online buying discussed in previous research, i.e., the need for activity, defined as motivation to participate in activities to uphold a busy and an active lifestyle (Chang et al., 2013). The positive emotion facet does not need to be related to shopping as fulfilling the need of activities, rather it is related to the emotional mind of consumers. Of course, the two facets—activity and positive emotions—are related, but the present study expands the notion of Extraversion to include an emotional mind, not just an activity. It is worth noticing that the FFM distinguishes between activity and positive emotions as facets of Extraversion (Costa & McCrae, 1992).

The analysis concerning the relationship between Agreeableness and online shopping provided valuable insights, that is, we both found and failed to find an association. As internet use and e-commerce increase, so do the opportunities to socialize online as well as people's confidence in using technology and e-commerce. This may suggest that the effect of Agreeableness on online shopping decreases as the digital development increases, possibly accounting for the null association between Agreeableness and online shopping. Thus, the explanations in previous research

telling us that people high in Agreeableness tend to shop *more* online as they have greater trust and confidence in technologies and online transactions (Iqbal et al., 2021), or that they tend to shop *less* online since they are not keen on socializing (Bosnjak et al., 2006), may not hold.

Another interesting issue is the use of control variables, such as age, in different studies. For instance, Bosnjak et al. (2006) reported a negative association between Agreeableness and online shopping but did not control for age. In the first step of our regression analysis, that is when age was not controlled for, we also found that people low in Agreeableness tend to buy more online. Therefore, there is reason to believe that previously reported relationships between Agreeableness and online shopping may have been spurious, i.e., “caused” by age. The null association between agreeableness and online shopping may thus imply that the lack of sociability as a key driver of online shopping (e.g., Wolfenbarger & Gilly, 2001) might need to be reconsidered and further explored in future research.

Neuroticism and online shopping were, in contrast to previous research, shown not to be associated. According to McElroy et al. (2007), Neuroticism is positively related to online shopping as online shopping might be used as a relief or escape from negative emotions. However, we did not find support for such a relationship in our study. Neither did we find support for a negative relationship in line with previous research, primarily explained by computer anxiety (Bosnjak et al., 2006; Iqbal et al., 2021). It is interesting to note that Bosnjak et al. (2006) only found a positive relationship after they had controlled for computer anxiety, while the other studies did not control for this variable. Therefore, it is likely that we would have found a positive relationship between Neuroticism and online shopping if we had measured and controlled for computer anxiety. Computer anxiety might thus be one reason as to why online stores as compared to brick-and-mortar stores do not match the immediate gratifications (i.e., coming into a better mood) that people high in Neuroticism search for.

To summarize, in addition to using different control variables (or not using any), differences between ours and previous findings might also be explained by the characteristics of research participants, such as age, gender, but also the country and the time in which data were collected. Another tenable reason for the differences in findings may be the use of different measurements of personality. It is also worth to notice that previous studies used the intention and motivation to buy online as the dependent variable (Bosnjak et al., 2006; McElroy et al., 2007), while the present study used self-reported frequencies of online shopping during the past twelve months.

4.1. Practical implications

We have shown that the more open to feelings (high in Openness), impulsive (low in Conscientiousness), and hedonic (high in Extraversion) a person is, the more the person tends to shop online. In light of these findings, we suggest that online retailers focus on delivering pleasant and exciting experiences that match the personality profile of online shoppers: affective, impulsive, and hedonic. We recommend an increased focus on exploring social and emotional experiences in online shopping and including platforms such as online brand communities that allow users to interact with each other (e.g., share ads, opinions, experiences, etc.). Cober et al. (2004) have, for instance, shown that affective feelings toward websites can be greatly enhanced by designing for playfulness. Our finding on Extraversion complements previous research in that it highlights the hedonic mindset of people high in Extraversion, which shifts the focus from social online *activities* to *feelings*, implying that online retailers need to design for pleasure and joyfulness to match the personality of these users (Roos, 2014).

The present study suggests that online shoppers tend to be more driven by enjoyment and feelings (hedonic motives) rather than control and trust (utilitarian motives; cf., Laudon & Traver, 2020; Wolfenbarger & Gilly, 2001). Perhaps control in our days is something that is taken for granted by online retailers and shoppers given the availability, speed and everyday use of the

internet and the well-developed search engines? That is, the frequent use of the internet makes trust and control less salient. Perhaps people who have a high need for control (e.g., people high in Conscientiousness) first search for information regarding the products they are interested to procure to later visit the physical store for a final evaluation before the actual purchase? And perhaps online retailers can increase the perception of control over the online environment (by increasing website credibility and by facilitating comparisons of alternative products and services) for people high in Conscientiousness, especially in the later stages of their clickstream behavior?

Implications of how different personality traits affect frequency of online shopping can be discussed with regard to how online retailers can increase their sales, as we have done so far, but the implication should also be discussed from a societal point of view in terms of what is a sustainable model in the long run. Thus, if e-commerce is designed to further increase the purchase frequencies of the consumers who already shop mostly online, it can drive problematic online shopping behavior such as indebtedness and compulsive buying (Kircaburun & Griffiths, 2018; Rose & Dhandayudham, 2014), and unsustainable ecological development, both through purchase hysteria and mail order returns. With return rates up to 60% in some product categories (i.e., fashion clothes), this means considerable problems for the environment (Cullinane & Cullinane, 2021). There is a possibility that people who are affective, impulsive, and hedonic in their characters can drive a development toward unsustainability. In the short term, consumer well-being may increase, as may the profitability of online retailers. In the long run, however, this can have negative consequences for people, society, and the planet.

If websites and advertising search engines are designed to match the urge to buy among impulsive people, does this mean that those people also become happier? In this regard, research shows that online shopping imposes psychological harm on, especially, people who are more impulsive (Himawari et al., 2018). Apparently, a match between buying behavior and personality does not always lead to increased well-being (cf., Matz et al., 2016).

4.2. Limitations and suggestions for further research

The results of this study must be viewed in light of its limitations. The cross-sectional nature of the data only permits us to explore associations between personality and online shopping and not causal effects. However, it might be argued that personality traits lead to online shopping behavior and not the other way around (Chamorro-premuzic, 2012).

Another limitation is the self-reporting of online shopping rather than a measure of factual frequencies of online shopping due to the risk of cognitive distortions although we argue that the response categories used reduce the risk for this type of bias. To estimate actual behavior from introspective self-reports and questionnaire ratings creates common problems in the field of social and personality psychology (Baumeister et al., 2007). We recommend future researchers to pay more attention to measuring actual online shopping behavior, for instance, through direct observations and automatic behavioral registrations (e.g., Jackson et al., 2003; Park et al., 2015).

Furthermore, the FFM was measured by a relatively short instrument (i.e., HP5i, (Gunnarsson et al., 2015; Gustavsson et al., 2003) which has been shown to be associated with lower reliability (Yarkoni, 2010). This in turn may attenuate the magnitudes of the relationships between variables. Thus, even though the magnitudes of the associations between personality traits and online shopping reported in this study, possibly partly due to low reliabilities in personality subscales, were quite modest, they were comparable to previous research results (e.g., Bosnjak et al., 2006; McElroy et al., 2007).

Although the ambition was to study the proposed relationships using a representative sample of the Swedish population (16–85 years), the sample was slightly underrepresented regarding young

adults (16–29) and residents with non-Swedish citizenships (Nilsson & Vernersdotter, 2011; Vernersdotter, 2012, 2013).

Finally, caution should also be taken in generalizing the present results to other countries and national cultures. Even if the FFM of personality has shown universal characteristics, online shopping and the relationships between personality factors and online shopping might differ across national boundaries. As previously discussed, it is also likely that technological development influences the relationship between online shopping and FFM, which implies that the relationships observed in Sweden at the time data were collected, and elsewhere, will change over time.

4.3. Conclusions

We have shown that the more open to feelings (high in Openness), impulsive (low in Conscientiousness), and hedonic (high in Extraversion) a person is, the more the person shops online, and these results also hold after controlling for gender and age. This suggests that the traditional view of the typical online shopper as primarily utilitarian and goal-directed (see, for instance, Laudon & Traver, 2020; Wolfinbarger & Gilly, 2001) seems to be a too-simplistic understanding of online shoppers. We argue that this is the main contribution of the present research alongside the use of frequency of online shopping as the dependent variable and a relatively large and representative sample facilitating generalization of the findings thereby adding to previous research.

One should also keep in mind that online shopping has been “encouraged” and therefore increased further since the outbreak of the Covid-19 pandemic and the restrictions following in its wake. The data in the present study were gathered several years before the pandemic. Thus, it would be interesting to investigate how the Covid-19 pandemic has influenced the relationships between motives, FFM of personality, and online shopping.

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Compliance with Ethical Standards – Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Informed Consent

Informed consent was obtained from all individual participants included in the study.

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