Resilience, vulnerability and personality effects on social commerce intentions: the COVID-19 era

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Abstract

Purpose – *This study aims to explore the relationship between social commerce purchase intention and consumer psychological factors (i.e. resilience, vulnerability and personality traits) during the COVID-19 pandemic.*

Design/methodology/approach – *Drawing on social cognitive theory (SCT), an econometrical behavioral model was developed to explore the key determinants of online purchase behavior of 303 students in Greece. The research data were collected with a two-wave online survey (pre- and during the pandemic) which was distributed randomly to students in Generation Z.*

Findings – *A series of regression analyses revealed a positive effect of openness and a negative impact of extraversion and neuroticism on internet, Instagram and Facebook purchases during the pandemic. Findings suggest that loneliness serves as a moderator, while resilience and vulnerability have a positive effect on social media purchase behavior.*

Practical implications – *This study provides insights and implications for social commerce marketers and sheds light on the determinants of online purchase intentions of young consumers during the COVID-19 pandemic.*

Originality/value – *Elaborating on SCT, this study provides novel insights into young consumers' internet use and online purchase behavior during the COVID-19 pandemic (i.e. longitudinal approach), by focusing on consumer vulnerability and resilience while also embedding personality traits and mental health aspects (i.e. loneliness levels during the pandemic).*

Keywords *Social media purchase intention, Social commerce, Resilience, Vulnerability, Personality traits, Students, Online purchase intention*

Paper type *Research paper*

1. Introduction

The coronavirus disease (COVID-19) outbreak generated fear and affected consumer psychology and behavior. Consumers react, cope and adapt to environmentally-imposed constraints, such as the COVID-19 pandemic (Kirk and Rifkin, 2020). Social distancing, social isolation and working from home were highly recommended if not enforced by governments around the world (WHO, 2020). In this context, the pandemic forced consumers to change their attitudes and purchasing habits (Wright and Blackburn, 2020). Despite the already established pervasiveness of internet and social media use in modern societies, social distancing has almost imposed the online networks as the main medium for human interaction and embedded it into consumers' daily routine in a different light. Internet traffic experienced an enormous increase while millions of people stayed at home to "flatten the curve" of the COVID-19 pandemic (Teodorovicz *et al.*, 2021). As a result, our lives were transformed by covering a "decade in days" as far as the adoption of online technology and social commerce triggered behavioral changes (Rahman *et al.*, 2022).

Preliminary studies suggest that the nature and the extent of the impact of COVID-19 on consumer behavior is not the same for all citizens and depends on several demographic and psychological factors (Cauberghe *et al.*, 2021). The study focuses on young consumers on Generation Z, as consumers' generation is a meaningful criterion for consumer segmentation and analysis (Sharma *et al.*, 2022; Hazzam, 2021). Young Americans on Generation Z perceive the COVID-19 as a stress inducing situation [1] and a more important threat for their finances compared to other generations (Schaeffer and Lee, 2020; Anindito and Handarkho, 2021) while they constitute an influential segment of family decision-making (Jose, 2021). Also, students have been the group with the most sensitivity to stressors related to COVID-19 (Walters *et al.*, 2021 and Mourelatos, 2021). Despite the enormous internet traffic during the pandemic, GenZ also experienced discontinuance intention toward social media use (Liu *et al.*, 2021). One should also note that Gen Z is the first truly digital native generation (Becker, 2022). Kim (2020) predicts that the digitalization of the marketplace and purchasing habits learned during the pandemic may bring about structural changes to consumption patterns as individuals maintain their modified behaviors once the pandemic ends. Despite existing research regarding the factors that affect the adoption of the COVID-19 vaccine, there is only scant emerging literature regarding their online behavior patterns (Jose, 2021). Thus, provided that Gen Z is the first digital native generation that was also largely affects by the pandemic, it is very timely and fruitful to examine GenZ online behavior (Becker, 2022).

Elaborating on social cognitive theory (SCT) that stresses the role of the environment on consumer behavior, consumer behavior literature and emerging COVID-19 research, we dynamically study the effect of consumer personality traits on consumer social commerce behavior during the pandemic, using a longitudinal approach and an econometrical behavioral model. The first goal of this paper is to explore how and why young consumers' behavior has changed during to the pandemic. The second goal of the paper is to examine the role of consumer personality traits on social commerce behavior during the pandemic. The findings contribute to the literature by providing the link between young consumers' internet use and online purchase behavior during the COVID-19 pandemic (i.e. longitudinal approach) by taking into account consumer psychological (i.e. vulnerability, resilience and loneliness) and personality traits.

2. Theoretical and conceptual framework

SCT emphasizes the role of the social environment on shaping individual cognition and behavior. SCT is a widely accepted theory that postulates a critical perspective for explaining human behavior and behavioral changes. SCT explores the psychological determinants of individuals by counting for behavioral, cognitive (personal) and environmental factors that continually interact with each other; and shape human behavior (Bandura, 1998). SCT provides opportunities for social support through instilling expectations, self-efficacy and using observational learning and other reinforcements to achieve behavior change (Bandura, 2001). Self-efficacy, as a SCT component, represents a self-regulatory mechanism that denotes not only the skill or capability of performing but also the self-belief in the capability of being efficacious, that is, being able to enhance motivation and problem-solving efforts (Bandura, 2001).

As mentioned above the pandemic caused significant psychological and behavioral changes, as consumers had to react, cope and adapt to the new environmental conditions (Kirk and Rifkin, 2020). Thus, the present study elaborates on the SCT to investigate the link between psychological factors and young consumers' online purchase behavior in the context of social commerce during the pandemic. Social commerce involves online communities that support user interactions and user-generated content and online purchases. Nearly 4.5 billion internet users engage in social media worldwide, while social commerce constitutes the next digital revolution representing $492bn sales that are expected to reach $1.2tn in 2025 (Danziger, 2022). The

impact and the fast-evolving landscape of social commerce has concentrated research scrutiny in consumers' perceptions, attitude and behavior (Zhang and Benyoucef, 2016). One should note that 97% of Gen Z consumers report they use social media as their top source of shopping inspiration (Kastenholz, 2021). Interestingly, although Generation Z consumers are the first generation that has become at home with social commerce, there is limited research focusing on their behavior and the underlying psychological processes in social media, along with whether and how their behavior changed during the pandemic (Anindito and Handarkho, 2021; Kastenholz, 2021).

We study how the social change generated by the pandemic affects young consumers' internet use and purchase intentions on Instagram and Facebook. In this vein, we focus on the effects of students' self-efficacy (i.e. vulnerability and resilience) (Kursan, 2021) and personality (Oshio *et al.*, 2018) on online behavior, using a two-way approach. First, we investigate longitudinally their general behavior regarding internet use during the pandemic and, second, changes in consumer purchase intentions on two well-known social media networks. Therefore, this study is expected to provide novel insights into young consumers' internet use and online purchase behavior during the COVID-19 pandemic, by focusing on consumer vulnerability and resilience while also embedding personality traits and mental health aspects (i.e. loneliness levels during the pandemic).

3. Hypotheses development

3.1 Resilience

Resilience refers to the degree to which an individual is capable of staying stable, healthy and functional after a potentially traumatic life event such as the pandemic and is defined as a stress-coping ability (Ball and Lamberton, 2015). Resilience is a dynamic process that includes positive adaption in the face of adversity (Oshio *et al.*, 2018). Research also suggests that the big five personality variables relate to resilience and may lead to an overall increase in the quality of life for an individual (Pyszkowska, 2020). In our case, within the SCT theoretical context, the resilience trait can be perceived as a self-efficacy determinant reflecting the level of a student's own capability to cope with a life changing event such as the pandemic (Bandura, 1998). Digital resilience is presented as "a dynamic personality asset" which promotes digital activation and engagement with opportunities while coping with challenges (UK Council for Internet Safety, 2020, p. 4). Young consumers with higher resilience cope more effectively with severe events (Kobasa, 1979), while there is only scant literature regarding the effects of resilience in social commerce in general (McHugh *et al.*, 2018). Given the consumer behavior context, initial studies try to explore the positive impact of resilience on consumers' purchase and repurchase decisions during the pandemic (Milaković, 2021). Hence, we propose the following:

H1. Young consumer resilience levels will, in general, positively influence the use of the internet and further social media purchase intentions through social media networks.

3.2 Vulnerability

Generally, vulnerability defines consumers who are prone to physical, psychological and economic difficulties (Smith and Cooper-Martin, 1997). Also, it identifies individuals with cognitive patterns that render them more susceptible to stress and refers to a cognitive structure that makes individuals more fragile under stress conditions, assuming that some people are more affected by stressful events than others (Sinclair and Wallston, 1999). Although vulnerability in young consumers concentrated research attention regarding excessive online gaming and internet use, there is limited knowledge about the role of vulnerability on social commerce behavior during the pandemic (Malik *et al.*, 2020). Drawing on the definition proposed by Baker *et al.* (2005), wherein consumer vulnerability arises from the interaction of personal states, characteristics and external conditions within

a given context; it seems worthwhile to explore consumer vulnerability within the COVID-19 setting through the lens of SCT. This suggests than an individual might feel vulnerable at any point in time, such as while making social media purchases during the pandemic (Milaković, 2021). Loh *et al.* (2022) underline the need to focus on vulnerability to explain online behavior during the pandemic. Provided the ambiguity condition during the COVID-19 era, the inclusion of consumer vulnerability is expected to produce a positive and significant effect on consumer decision-making (Brennan *et al.*, 2017). Hence, we propose the following:

H2. Young consumer vulnerability levels will, in general, positively influence the use of internet and further social media purchase intentions through social media networks.

3.3 Personality

Heterogeneity among internet and social media users is well documented in the literature (Hamburger and Ben-Artzi, 2000). Younger consumers with a higher level of education and income are in general more likely to use the internet compared to older people with a lower education and income level (Pew Research Center, 2020). Thus, the link between consumers' personality, and internet and social media use has lately received growing research scrutiny (Amichai-Hamburger *et al.*, 2008; Eastman *et al.*, 2020). Recently, Rapp *et al.* (2019) linked specific personality traits with network structures preferences. The COVID-19 pandemic instilled fear among individuals, particularly among those belonging to Generation Z, leading to an inundation of information and subsequently causing information overload fatigue. This, in turn, has resulted in a decreased intention to continue using social media platforms (Liu *et al.*, 2021).

3.3.1 Openness. Extant knowledge that focuses on students shows that more introverted, less agreeable and less conscientious students are involved in higher levels of internet usage (Landers and Lounsbury, 2006). Although there is some knowledge regarding specific personality traits and social media use, findings are still inconclusive and further insights are needed. Amichai-Hamburger and Vinitzky (2010) argued that mainly openness, extraversion and neuroticism are relevant to Facebook use. Özgüven and Mucan (2013) showed that only openness is positively associated with social media use by students. Aydin (2019) showed that openness positively affects social media purchase intentions but called for further research regarding the link of personality traits and social media consumption patterns. Thus, we hypothesize that:

H3a. Openness will result in higher internet use and social media purchase intentions.

3.3.2 Extraversion. Extraversion is found to be negatively associated with internet use (Van Der Aa *et al.*, 2009) and positively associated with Facebook use, without purchase activities (Seidman, 2013; Ryan and Xenos, 2011). Ross *et al.* (2009) supported that extraversion is related to Facebook use. Still, Özgüven and Mucan (2013) showed that extraversion in young consumers is not associated with social media use, while Liu *et al.* (2021) showed the pandemic urged Gen Z consumers to discontinue using social media. Thus, the following hypotheses is postulated:

H3b. Extraversion will result in lower internet use and social media purchase intentions.

3.3.2 Neuroticism. Individuals with high neuroticism, in general, are attracted by social media and are more likely to be addicted to the internet (Andreassen *et al.*, 2013). Initially, research supported that neuroticism is related to Facebook use (Ross *et al.*, 2009; Amichai-Hamburger and Vinitzky, 2010). Still individuals with high neuroticism have also been affected the most by the pandemic, resulting in isolation, coping strategies and abstention from online environments (Kroencke *et al.*, 2020). More recent research on university students shows that extraversion and neuroticism are not associated with social media search (Atman Uslu and Yildiz Durak, 2022), while Gen Z consumers experienced high levels of social media discontinuance during the pandemic (Liu *et al.*, 2021). Hence, we propose:

H3c. Neuroticism will result in lower internet use and social media purchase intentions.

3.4 Loneliness

Loneliness is defined as a common experience as few people avoid being lonely at some point in their life and it is already linked to online social networks (Lim and Kim, 2018). From the early stages of internet penetration, some scholars raised their concerns regarding the effect of heavy internet use on feelings of loneliness or social isolation (Asher *et al.*, 1984; Kraut *et al.*, 1998) and its interaction with personality tendencies (i.e. extraversion and neuroticism) (Amichai-Hamburger and Schneider, 2014). Amichai-Hamburger and Ben-Artzi (2003) argue that consumers who experience loneliness are attracted by the internet and social networks. Although there is some evidence on the effect of social information seeking on loneliness among students, there is very limited knowledge regarding the interaction effect between loneliness and other psychological factors on social commerce behavior during a life-shocking condition (Thomas *et al.*, 2019).

Regarding resilience, Gerino *et al.* (2017), by analyzing older individuals stressed by retirement, pointed out that the effects of loneliness go through individuals' resilience dimensions by following an opposite direction. We also support that this might also be true for youngsters under COVID-19 life restrictions. On the other hand, research has established vulnerability to be uniquely associated with loneliness (Kealy *et al.*, 2022). Hence, we propose the following:

H4. Loneliness will moderate the effects of students' resilience and vulnerability on social media purchase behavior. A higher feeling of loneliness will be associated with vulnerability and a lower sense of loneliness with resilience effects on social media purchase intentions.

4. Methodology, sample and data collection

4.1 Procedure

The study consisted of two sequential phases held over a three months' period, and our data were collected after a two-time period questionnaire distribution to potential participants to measure the online behavioral change, by capturing two phases during the governmental restrictions [2]. When the Greek Government announced the closure of all public schools from March 10 to May 11, 2020, following the confirmation of the first three cases of COVID-19 in Greece on February 27, we sent an online questionnaire randomly to secondary school students through the online systems of private supplementary tutoring schools. Our questionnaire was distributed randomly to students through emails with an embedded link to our survey in the early period of the pandemic in Greece. Of the 612 students approached, 454 participated in the screening and 419 of them were eligible for the study and were then asked to answer the questionnaire [3]. Our participant students were between 14 and 17 years old. The study was limited to the participation of students whose parents provided their consent through each respective supplementary tutoring school, which served as an intermediary during the initial stages of the recruitment process. In general, we had almost 99% of parental consents, so our study does not suffer from non-active parental consent decisions (Shaw *et al.*, 2015). Finally, 303 completed responses were returned for both waves, as 116 initial student-participants did not have a response to the second wave. The research took place in Greece a country that combines a slow pace in internet integration, a high penetration of social media usage among young individuals and an outstanding management of the COVID-19 pandemic until the period of this study (Holliday, 2020). Greece was ranked 26th among the 28 members of the European Union in 2019 on the bloc's Digital Economy and Society Index (The National Herald, 2020). Although a mere 69% of Greeks state that they use the internet at least occasionally or own a smartphone, 97% and 94% of young people use the internet and social media accordingly (Pew Research Center, 2020). Further, three days after the announcement of a full lockdown, internet use increased by 75% in Greece (ekathimerini.com, 2020). For that reason, we chose Greece to be the field of our study.

4.2 Assessment of non-response bias and common method bias

The desired number of responses in the first and second wave was obtained within the given timeframe and no reminders were sent to the students, which means that the data was obtained from one group within a certain timeframe. Consequently, non-response bias, which refers to comparing early and late responses, is a non-issue in the current study.

However, the problem of common method bias can occur and might influence the validity of the study. We adopted several measures to alleviate this issue, as our data were collected from the same source for all respondents (Podsakoff *et al.*, 2003). First, the confidentiality of the respondents was ensured to minimize socially desirable responses. The questionnaires were online and anonymous, and each IP address can only be filled in once per survey wave, to ensure the confidentiality and reliability of data. Second, to improve content adequacy, we used established scales and engaged in a thorough screening of the clear linkage of individual items to construct definitions. We also ensured that the respondents understood that there were no right, or wrong answers and that the objective of the study was to clearly picture the situation at an aggregate level. Finally, we applied Harman's single-factor test. Its results explained approximately 32%, which is less than the threshold value of 50%. No single factor surpassed the threshold value of 50%. Hence, the assumption of common method bias was ruled out (Chang *et al.*, 2020).

4.3 Measurements

Students in the beginning of the questionnaire ought to report the exact date and time of their starting point and the last four digits of their ID number to identify the unique information being assigned to each participant (i.e. participation was anonymous). Participants reported their demographic characteristics (i.e. gender, region of residence, FAS index [4]) and some cognitive skills such as their average grades of the current school year. Following the demographics, participants should report their average time of internet usage (i.e. for our study this is the *before* the COVID-19 new life conditions measurement) (i.e. average minutes per day) and the level of Instagram and Facebook use for purchases (i.e. for our study this is the *before* the COVID-19 new life conditions measurement), on a five-point Likert scale measurement.

Next, resilience was measured during the first wave to be unbiased from the pandemic progression. Resilience was measured using the brief resilience scale which consists of six items on a five-point Likert scale (Cronbach's alpha = 0.91) (Smith *et al.*, 2008). The scale includes questions like "I tend to bounce back quickly after hard times" and "It does not take me long to recover from a stressful event." Similarly, the vulnerability scale consists of six items on a five-point scale varying from 1 "Does not describe me at all" to 5 "Describes me very well." Vulnerability was measured with the psychological vulnerability scale (i.e. a 6-item measure of a set of cognitions that promote harmful reactions to stress) and was captured during the first wave of questionnaires to be unbiased from the pandemic progression (Cronbach's alpha = 0.90).

To assess personality, the questionnaire included a self-report measure of the Big Five Personality Inventory. The BFPI contains 44 items which are scored on a five-point Likert scale from "strongly agree" 1 to "strongly disagree" 5 and provides measures for each personality trait i.e. openness, conscientiousness, extraversion, agreeableness, neuroticism (OCEAN [5], hereafter). Afterwards, the OCEAN factors were constructed through a factor analysis, so that each trait is orthogonal to the rest (McCrae and Costa, 1987;1999). Hence, the normalized version of OCEAN variables has a range of 1 to 5, where 1 denotes a very low incidence of the trait and 5 a very high level of the trait respectively. Reliability for the five factors is acceptable (Cronbach's alpha from = 0.68 to = 0.80).

After two months of COVID-19 life restrictions, a second email was sent to the initial participants, asking them to report again their average time of internet usage (i.e. for our study this is the *during* the COVID-19 measurement of internet usage) (i.e. average minutes per day) and their level of Instagram and Facebook use for purchases (i.e. for our study this is the *during* the COVID-19 measurement of Social Media usage), on a five-point Likert Scale measurement.

Finally, participants, responded to the children's loneliness questionnaire and social dissatisfaction scale (CLQ). The CLQ is a 24 item self-report inventory used to assess feelings of loneliness in children and adolescents (Asher *et al.*, 1984). The questionnaire consists of 16 items that center around feelings of loneliness and social dissatisfaction and eight items asking about hobbies and interests used as filler questions with a five-point Likert scale answering form (Asher and Wheeler, 1985). The CLQ has been shown to be effective in identifying loneliness, particularly in identifying children reaction to major negative events as the Pandemic is (Asher and Wheeler, 1985).

Sampling students for quantitative research is a challenging exercise (Delice, 2010). For that reason, a the five-point Likert scale is adopted. This response scale is simple to understand and use for survey administrators and respondents alike. It takes less time and effort to complete than higher-point scales. Fits mobile device screens better than higher-point scales and respondents have choices without becoming overwhelmed.

4.4 Summary statistics

Table 1 presents the descriptive statistics for the sample. Due to the pandemic restrictions, the use of the internet increased by 54.5%, online purchase intentions from Instagram by 39.4% and from Facebook by 25.3%. Students have a loneliness index of 66.28, indicating a low level of the average loneliness sense. For that reason, the sample is divided into two groups in the main analysis (i.e. students with high (median split) and students with the low sense of loneliness.

In respect to the demographic characteristics, the sample consists of 57,1% females, with average age 16 and average grades approximately 17.9. Moreover, 8.9% of participants originate from single child families, with 81.8% being in a nuclear status. Furthermore, 54.1% of students were spotted in urban areas, while 29.7% at suburban and 16.2% at rural areas. The average social economic index (i.e. FAS) is approximately 12.1, showing a representative sample of the adolescent population (Currie *et al.*, 2014). In our empirical model, we use a dummy version of the FAS index, by having a median split (i.e. low and high FAS index groups). Resilience index (M = 3.36, SD = 1.07) and vulnerability index (M = 2.97, SD = 1.13) are also included in Table 1.

Based on the observed variation in personality traits, we notice that the mean score for openness is 3.568, indicating a sample of students with a high tendency toward creativity and active imagination; for conscientiousness, the mean score is 3.458, signifying high levels of thoroughness; for extraversion, the mean score is 3.174, exhibiting a satisfactory level of students' energetic behavior; for agreeableness, the mean score is 3.695, indicating that participants are more empathetic and altruistic; and for neuroticism, the mean score is 2.842, suggesting that the sample does not tend to experience in general negative emotions. For all personality variables, we did not notice a great number of extreme values (Appendix Figure A1 – Box Plot).

4.5 Individual differences

Table 2 presents the differences of personality for high and low levels of loneliness. Individuals with low levels of loneliness have higher levels openness ($|t| = 3.83$, $p = 0.001$), while individuals with low levels of loneliness, appear to be more conscientious ($|t| = 4.53$,

Table 1 Sample descriptive statistics

Variable	*Mean*	*SD*	*Min*	*Max*	N
Social media outcomes					303
Average change on internet use	0.545				
Average change on Instagram purchase intention	0.394				
Average change on Facebook purchase intention	0.253				
Pandemic behavioral outcomes					
Loneliness index*	66.277	9.807	30	80	303
Personality traits					
Openness	3.568	0.523	1.7	4.8	303
Conscientiousness	3.458	0.557	2	4.9	303
Extraversion	3.174	0.604	1.25	4.75	303
Agreeableness	3.695	0.482	2.33	5	303
Neuroticism	2.842	0.647	1.125	5	303
Social cognitive theory					
Resilience	3.36	1.07	2.16	4.43	303
Vulnerability	2.97	1.13	2.02	4.23	303
Demographic and social economic attributes					
Female (0/1)	0.571	0.496	0	1	173
Age	16.05	1.341	14	17	303
School Grades**	17.855	1.605	12.5	20	303
FAS Index***	12.069	1.862	5	18	303
Single child family	0.089	0.285	0	1	303
Family type					
Both parents	0.818				248
Single mother	0.132				40
Single father	0.030				9
Other relative	0.020				6
Family area type					
Rural	0.162				49
Suburban	0.297				90
Urban	0.541				164

Notes: *In our analysis, we divided the sample to two groups of loneliness (high vs low) by having the median split of the original variable, **In our analysis we used the high grade variable which contain students with grades above the average (median split), ***In our analysis we used the high FAS index variable which contain subjects with social economic index above the average (median split)
Source: Data set with results drawn from the questionnaire. Author's calculation

Table 2 Paired sample t-tests for differences of subjects' personality traits on loneliness levels

Personality traits	*High loneliness [1]*	*Low loneliness [2]*	*Difference [3]: [2] – [1]*
Openness	3.501	3.756	0.255***
Conscientiousness	3.374	3.693	0.319***
Extraversion	3.003	3.650	0.647***
Agreeableness	3.582	4.011	0.429***
Neuroticism	2.949	2.542	0.407***

Notes: The t-test is the statistics of contrast of a test of no-difference in means between participants, *** <1%, **<5%, *<10%
Source: Authors' calculations

p = 0.000), more extraverted (|t| = 9.29, p = 0.000) and with higher levels of agreeableness (|t| = 7.42, p = 0.000).

On the opposite direction, students with low loneliness levels, seems to be less neurotics (|t| = 5.01, p = 0.000). All the abovementioned individual differences on personality are statistically significant at 1% level of significance

5. Empirical study

5.1 Model

Basic econometric methods are used to investigate whether the relationship between personality traits and the use of internet, Facebook and Instagram purchases is heterogeneous across subjects' individual characteristics. The following baseline regression specification based on Cubel *et al.* (2016) is estimated by ordinary least squares:

$$Yi = \alpha + \sum_{n=1}^{5} \beta^n NC_i^n + \gamma^k \mathrm{SC}\, T_i^k + \delta^m X_i^m + \varepsilon_i \quad (1)$$

where Y_i is the internet and social media measurements (i.e. use of Instagram and Facebook) by participant, NC_i is a n-vector of non-cognitive skills of worker i (where n = 1,...,5 corresponds to openness, conscientiousness, extraversion, agreeableness and neuroticism, respectively), SCT includes the social cognitive variables of resilience and vulnerability index of the participants and X_i are the personal characteristics and behaviors (i.e. demographic, cognitive, level of loneliness and social economic attributes). Our specification also controls for gender, schooling grades, social economic index (i.e. FAS index), single child status, types of family structure and area of residence. Furthermore, to investigate the moderating role of loneliness, we divide our sample into students with high vs low level of loneliness by having the original variable as a median split (Iacobucci *et al.*, 2015a, 2015b). Additionally, to allow for an easier interpretation of our estimates, Big Five scores are standardized to have a mean zero kai standard deviation of one. Finally, ei is the i.i.d. disturbance term.

5.2 Results

5.2.1 Internet. Table 3 presents our baseline effects of personality traits on the average daily internet usage (i.e. hourly based), by controlling also for demographics, social economic attributes and family type. Figure 1 illustrates the positive or negative relationship of each trait on internet use.

As in studies in the literature, we observe a negative relationship between an individual's level of extraversion and the daily use of internet. More specifically, an increase of a standard deviation in the level of extraversion is associated with a decrease in internet use of about 1 h in Column 1 (i.e. absolute change), a decrease of 19,4% in Column 2 (i.e. percentage change) and a decrease of approximately half hour regarding the internet use during the COVID-19 period. Individuals with high loneliness exhibit a decrease of 0.8 h, while the amount is doubled for subjects with lower levels of loneliness. The negative effect of extraversion is robust at 1% level of significance, for all the above-mentioned specifications. We partially confirm hypothesis *3b*.

Although not in our hypotheses, weak effect of conscientiousness and agreeableness on the percentage change of the internet use were observed.

Regarding resilience and vulnerability, they both have a positive impact on internet use confirming hypotheses *1* and *2*. A rise of one standard deviation on resilience is associated with a rise of 8.3% on the percentage change of the internet use (column 2), while this effect holds for the individuals with low sense of loneliness (column 5). In the same direction, a rise of one standard deviation on vulnerability is associated with a rise of 12.4% on the percentage change of the internet use (column 2), while this effect holds for the individuals with high sense of loneliness, while for individuals with low levels of loneliness the effect follows the opposite direction (column 5) (hypothesis *4*).

5.2.2 Instagram. Table 4 includes five (5) specifications for the Instagram usage. At first, data suggest that the effect of extraversion on Instagram usage seems to exist only in Columns 1 and 2. More precisely, an increase of a standard deviation in the level of extraversion is associated with a decrease of approximately 10% of the use of Instagram for purchase reasons. This effect, disappears, when we moderate the sample according to the

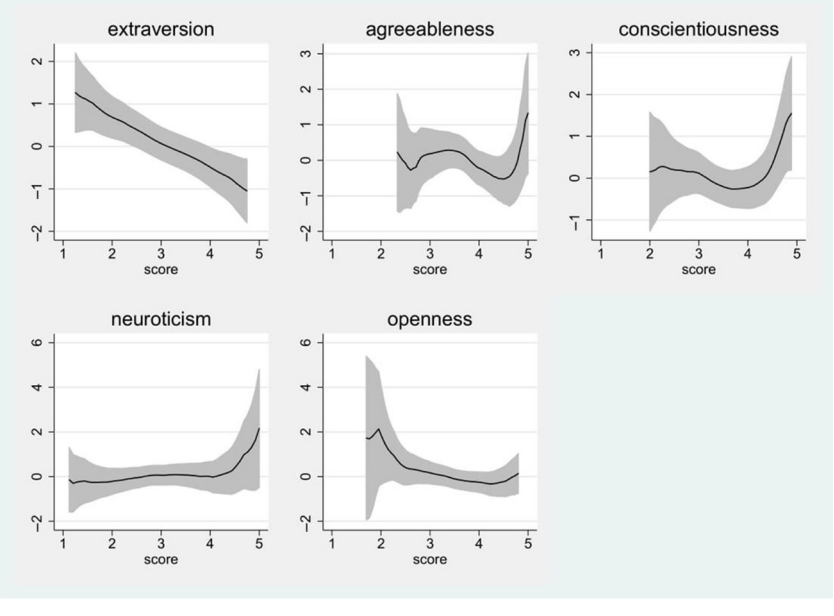
Table 3 Determinants of the internet use

	Absolute change [1]	*Percentage change [2]*	*Use of the internet During the pandemic [3]*	*High loneliness [4]*	*Low loneliness [5]*
Constant	2.102*** (0.576)	0.665*** (0.154)	8.176*** (0.615)	2.755*** (0.906)	−0.197 (1.437)
Personality traits					
Openness	−0.012 (0.144)	0.004 (0.024)	−0.078 (0.186)	−0.310 (0.205)	0.651 (0.497)
Conscientiousness	0.164 (0.246)	0.195** (0.092)	−0.613* (0.332)	0.271 (0.282)	0.175 (0.295)
Extraversion	−0.907*** (0.203)	−0.194** (0.066)	−0.481*** (0.119)	−0.766*** (0.184)	−1.722*** (0.309)
Agreeableness	−0.083 (0.187)	−0.159*** (0.044)	0.270 (0.194)	−0.234 (0.190)	−0.217 (0.379)
Neuroticism	−0.020 (0.108)	−0.096 (0.063)	0.250 (0.164)	0.041 (0.160)	0.138 (0.669)
SCT					
Resilience	0.021** (0.018)	0.083** (0.023)	0.026* (0.024)	−0.011 (0.101)	0.069*** (0.031)
Vulnerability	0.034* (0.111)	0.124*** (0.023)	0.221*** (0.114)	0.341** (0.120)	−0.111* (0.029)
Behavior during pandemic					
Loneliness	0.012* (0.007)	0.010** (0.004)	0.014 (0.009)	–	–
Demographics and social economic attributes					
Female	−0.491** (0.189)	−0.282** (0.130)	−0.997** (0.421)	−0.642* (0.363)	0.354 (0.314)
High schooling grades	0.034 (0.601)	0.253 (0.170)	−1.307** (0.588)	−0.521 (0.748)	2.014 (1.295)
Single child status	0.015 (0.276)	0.406** (0.157)	0.270 (0.750)	−0.759* (0.417)	0.818* (0.441)
FAS Index	0.482 (0.281)	−0.117 (0.135)	0.296 (0.184)	0.341 (0.354)	0.547 (0.379)
Observations	303	303	303	223	80
R^2	0.087	0.130	0.135	0.087	0.258

Notes: The use of the internet is measured on hourly basis. Resilience and vulnerability are standardized for interpretation reasons. The specifications control for age, family type and family area residence, heteroscedasticity corrected standard errors with clustering at regional level, Statistical Significance: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$

Source: Authors' calculations. Data drawn from the online survey

Figure 1 Relationship between personality traits and internet use



Source: Authors' calculations. Data drawn from the online survey

Table 4 Determinants of the Instagram purchase intention

	Use of the Instagram for product purchase				
	Absolute change [1]	*Percentage change [2]*	*During the pandemic [3]*	*High loneliness [4]*	*Low loneliness [5]*
Constant	1.010*** (0.191)	0.756*** (0.174)	3.331*** (0.133)	1.072*** (0.202)	0.662* (0.354)
Personality traits					
Openness	0.511*** (0.066)	0.299*** (0.027)	0.742*** (0.097)	0.482*** (0.047)	0.429* (0.269)
Conscientiousness	0.080 (0.081)	0.044 (0.053)	−0.039 (0.042)	0.126 (0.084)	−0.014 (0.074)
Extraversion	−0.172** (0.063)	−0.099** (0.045)	0.077 (0.061)	−0.126 (0.081)	0.176 (0.209)
Agreeableness	−0.008 (0.033)	0.043 (0.029)	0.062 (0.046)	0.052 (0.043)	−0.243 (0.149)
Neuroticism	−0.083** (0.038)	−0.024 (0.054)	0.001 (0.043)	−0.003 (0.058)	−0.393*** (0.065)
SCT					
Resilience	0.013* (0.015)	0.088** (0.013)	0.031** (0.014)	−0.034 (0.131)	0.088*** (0.021)
Vulnerability	0.054** (0.032)	0.222*** (0.033)	0.225*** (0.117)	0.121** (0.141)	−0.099* (0.029)
Behavior during pandemic					
Loneliness	0.010*** (0.002)	0.008*** (0.001)	0.003 (0.002)	–	–
Demographics and social economic attributes					
Female	0.069 (0.128)	−0.058 (0.083)	0.205** (0.074)	0.006 (0.177)	0.306 (0.174)
High schooling grades	−0.195 (0.168)	−0.168 (0.153)	−0.121 (0.192)	−0.243 (0.194)	0.246 (0.192)
Single child status	−0.252** (0.109)	−0.221** (0.083)	−0.218 (0.143)	−0.237 (0.231)	−0.202 (0.157)
FAS Index	−0.038 (0.117)	−0.003 (0.116)	−0.016 (0.043)	−0.135 (0.136)	0.283** (0.106)
Observations	303	303	303	223	80
R^2	0.216	0.146	0.375	0.220	0.283

Notes: The use of Instagram for online purchase is measured on Likert scale basis (1–5). Resilience and vulnerability are standardized for interpretation reasons. The specifications control for age, family type and family area residence, heteroscedasticity corrected standard errors with clustering at regional level, statistical significance: ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$
Source: Authors' calculations. Data drawn from the online survey

loneliness index. Next, we observe a robust negative effect of the neuroticism on Instagram usage, only for individuals with low loneliness (Column 5). Also, neurotic subjects with low loneliness lower their Instagram engagement, during the COVID-19.

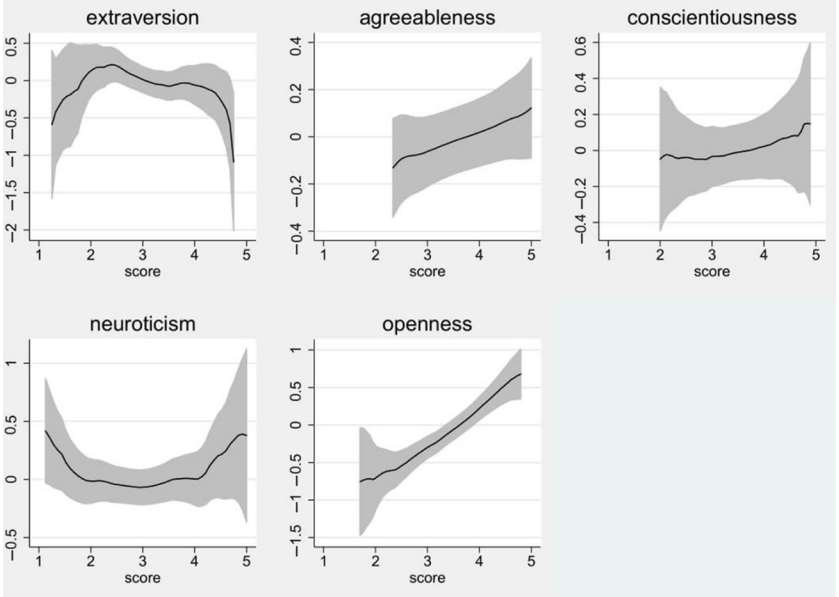
Regarding the openness to new experiences personality trait, a statistically significant impact at 1% level of significance, rise to the surface in all the specifications. As Table 4, and Figure 2, individuals exhibiting high levels of openness tend to increase their Instagram purchases by approximately 30%. Furthermore, this effect appears to be independent of their loneliness index. Students with high levels of extraversion and neuroticism follow the opposite direction (hypotheses 3a, 3b, 3c).

In relation to the resilience and vulnerability indexes, we observe that they have a positive impact on students' online purchase behavior through the Instagram app. For example, a rise of one standard deviation on resilience is associated with a rise of 8.8% on the percentage change of the Instagram use (column 2), while this effect holds also for individuals with low sense of loneliness (column 5). In the same direction, a rise of one standard deviation on vulnerability is associated with a rise of 22.2% on the percentage change of the Instagram purchases (column 2), while this effect holds for individuals with high sense of loneliness, while for individuals with low levels of loneliness the effect again follows the opposite direction (column 5). We confirm hypotheses *1*, *2* and *4*.

5.2.3 Facebook. Concerning Facebook, it is noteworthy that, extraversion and openness have also an important role as the key determinants of participants' online purchase intentions. Thus, similarly to the Instagram case, extraverted subjects, reduced the level of Facebook purchases approximately 18%, at 1% level of significance (Column 2). The magnitude of this effect varies from −0.214 to −0.843 in relation to the individuals' loneliness levels (*H3b*).

In all specifications, openness, plays a critical role in shaping online behavior of the subjects regarding their time-oriented activity on Facebook. Thus, an increase of one

Figure 2 Relationship between personality traits and purchase intentions on Instagram



Source: Authors' calculations. Data drawn from the online survey

standard deviation in the level of openness is associated with an increase of approximately 29% of the use of Facebook by the students. This positive effect is robust at 1% level of statistical significance (Table 5, Column 2 and Figure 3) (*H3a*). In relation to the loneliness index, we notice that, in the low loneliness sub-sample, the impact of openness grows bigger (i.e. 0.640). With reference to the remaining personality characteristics, neurotics, similarly to the Instagram findings, seem to restrict their Facebook purchases, especially in the case in which their loneliness index is low (*H3c*).

Regarding students' levels of resilience and vulnerability, we observe that they have again a positive impact on students' purchase intentions through Facebook. For example, a rise of one standard deviation on resilience is associated with a rise of 10.1% on the percentage change of the Facebook purchases (column 2), while this effect holds also for the individuals with low sense of loneliness (column 5). In the same direction, a rise of one standard deviation on vulnerability is associated with a rise of 28.9% on the percentage change of the Facebook purchases as a way for online purchase (column 2), while this effect holds for the individuals with high sense of loneliness, while for individuals with low levels of loneliness the effect again follows the opposite direction (column 5). We confirm again hypotheses *1* and *2*.

In both Instagram and Facebook specifications, it is interesting that, we notice similar effect of subjects' loneliness (Tables 4 and 5). A rise of 1% at the level of a student's loneliness index, has a positive effect on Instagram and Facebook purchases by approximately 0.8%, at 1% level of significance.

6. Discussion

6.1 Overview of findings

Given the impact of social distancing on all human behavior aspects and the seriousness of the COVID-19 crisis for both consumers and retailers, the goal of this paper was to explore if and how young consumers' online behavior changed during the pandemic, by focusing

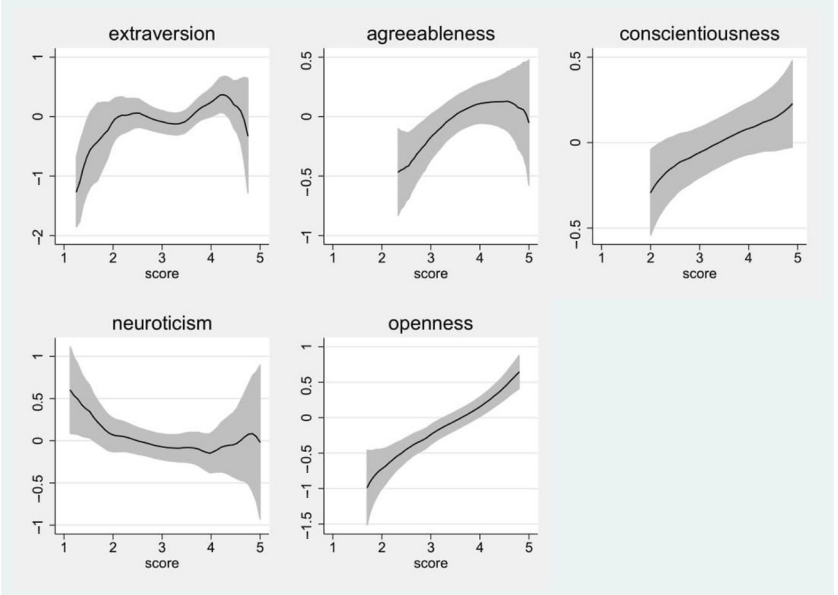
Table 5 Determinants of the Facebook purchase intention

	Use of the Facebook for product purchase				
	Absolute change [1]	*Percentage change [2]*	*During the pandemic [3]*	*High loneliness [4]*	*Low loneliness [5]*
Constant	0.941*** (0.188)	0.827*** (0.218)	3.133*** (0.229)	1.002*** (0.114)	0.986* (0.555)
Personality traits					
Openness	0.518*** (0.053)	0.288*** (0.021)	0.662*** (0.068)	0.445*** (0.044)	0.640*** (0.184)
Conscientiousness	−0.055 (0.044)	−0.052 (0.046)	−0.041 (0.042)	−0.010 (0.068)	−0.093 (0.054)
Extraversion	−0.348*** (0.036)	−0.178*** (0.044)	−0.038 (0.066)	−0.214** (0.072)	−0.843*** (0.123)
Agreeableness	0.032 (0.061)	0.060 (0.051)	0.066** (0.029)	0.023 (0.079)	−0.092 (0.169)
Neuroticism	−0.059* (0.038)	−0.029 (0.026)	−0.005 (0.031)	0.049 (0.057)	−0.306*** (0.087)
SCT					
Resilience	0.010** (0.014)	0.101* (0.022)	0.046** (0.044)	0.031 (0.022)	0.073*** (0.034)
Vulnerability	0.087** (0.033)	0.289*** (0.031)	0.301*** (0.216)	0.104** (0.102)	−0.054* (0.020)
Behavior during pandemic					
Loneliness	0.011*** (0.002)	0.008*** (0.002)	0.003 (0.002)	–	–
Demographics and social economic attributes					
Female	−0.111 (0.125)	−0.117 (0.116)	0.068 (0.128)	−0.170* (0.094)	0.023 (0.272)
High schooling grades	−0.026 (0.154)	−0.047 (0.087)	0.028 (0.212)	−0.080 (0.147)	0.232 (0.170)
Single child status	−0.385* (0.205)	−0.269* (0.144)	−0.382* (0.200)	−0.494** (0.216)	−0.579 (0.332)
FAS Index	−0.132 (0.102)	−0.149 (0.098)	−0.092* (0.052)	−0.246*** (0.063)	0.052 (0.267)
Observations	303	303	303	223	80
R^2	0.219	0.181	0.326	0.208	0.383

Notes: The use of Facebook for online purchase is measured on Likert scale basis (1–5). Resilience and vulnerability are standardized for interpretation reasons. The specifications control for age, family type and family area residence, heteroscedasticity corrected standard errors with clustering at regional level, statistical significance: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$

Source: Authors' calculations. Data drawn from the online survey

Figure 3 Relationship between personality traits and purchase intentions on Facebook



Source: Authors' calculations. Data drawn from the online survey

on internet, Facebook and Instagram. Through the lens of social cognitive theoretical framework, we measured young consumers' resilience, vulnerability and personality traits, and we modeled their behavioral change on online purchase by also controlling for several sources of individuals' heterogeneity. The contribution of the present paper is that it provides insights about the effect of the pandemic on Gen Z consumers, the first truly digital native Generation, on their online behavior by taking into consideration several psychographic and behavioral criteria. Considering that some scholars argue that the changes attributed to the pandemic are likely to be persistent or to have carry-over effects, it is very crucial to track and trace these changes (Kim, 2020).

In line with our assumptions, extraversion predicts the decrease of internet and social commerce intentions during the pandemic. While several studies pointed out, that extraverted individuals have an online addiction (Wilson *et al.*, 2010; Blackwell *et al.*, 2017), this study shows that this effect is reversed due to the pandemic conditions. A possible interpretation is that, although extraverts crave social interaction and are more likely to use social media, during the pandemic, this behavior changed, possibly because extraversion is positively correlated with stressed life conditions and situations (i.e. the pandemic) and the need for social support (Swickert *et al.*, 2002).

The link between personality and the use of internet and social media purchases during a stressed life period (i.e. COVID-19), passes through another personal attribute, named openness to new experiences. Findings reveal a robust positive impact of this trait on internet use and social media purchases. A possible interpretation is that consumers with high "openness to new experience" increased in general their Web usage for both entertainment and information purposes during the pandemic (Tuten, and Bosnjak, 2001). On the other hand, neuroticism, in our research, is once again negatively correlated with subjects' online behavior (Tuten, and Bosnjak, 2001; Blackwell *et al.*, 2017). Interestingly though, the magnitude of these negative effects of neuroticism seems to be high and more robust in the case of participants with low levels of loneliness index (Mourelatos, 2021). Finally, this study proposes a positive correlation between resilience and vulnerability on students' purchase intention, which is supported by the obtained result (Kursan, 2021).

6.2 Theoretical implications

This research contributes to the literature by examining the effect of the pandemic on online consumer behavior in three different online contexts of consumer that belong to Gen Z by taking into consideration several psychographic and behavioral aspects. Certain theoretical contributions can be highlighted.

First, this study shows that SCT is a valuable framework for studying the online behavior of young consumers. The present study focuses on Gen Z consumers. As other authors have pointed out, the incorporation of consumers' Generation in consumer behavior studies is meaningful (Hazzam, 2021). This can be even more crucial in the case of a crisis or a specific momentum as COVID-19 is, where a specific segment is greatly affected in a different manner from other consumer segments (Walters *et al.*, 2021; Mourelatos, 2021) and where the changes are likely to be structural and persistent. By studying three different contexts of participants' behavior, the present study further confirms the potential contextual aspects of online decision-making (Slovic, 1995). Also, the findings show that personality traits are an important construct also in digital environments (Mourelatos *et al.*, 2022 and Manganari *et al.*, 2022). Research in personality traits seems inconclusive yet growing, so it is important to thorough examine their role for specific consumer segments and in different contexts and conditions. This novel insight calls for further consideration of resilience and vulnerability in marketing research, particularly when addressing purchase intentions in digital environments.

6.3 Managerial implications

The findings of the current research provide managers with some recommendations. The results support previous findings about changes in the purchasing decision process during a health crisis. Namely, our findings provide a deeper understanding of Generation Z consumers' behavior in the context of a crisis for marketers and retailers. Also, managers can better understand the impact of resilience and vulnerability, especially for young consumers, and adapt their marketing strategies and campaigns to achieve a better purchase experience (e.g. repurchase, higher purchase satisfaction levels) (Milaković, 2021), engagement and consumer loyalty (Sharma *et al.*, 2020).

Our results, mainly, highlight the importance of the personality aspect of extraversion and suggests that marketing managers should further humanize their brands in digital settings to improve electronic word-of-mouth, which directly affects purchase intentions. Managers should consider personalizing the Web interfaces based either on the user's profile or prior responses and experiences to enhance consumer engagement (Sharma *et al.*, 2020). Extraverts seem to decrease the use of internet and social commerce during the pandemic. Enhanced interactivity, vividness and playfulness could possibly engage extraverts more effectively. Undoubtedly, COVID-19 rapidly reshapes consumers' behavior, attitudes and purchasing habits and highlights the impact and growth of online shopping. Hence, the spread of coronavirus has drastically raised and spurred the needs and importance of social commerce adaptation toward consumers' purchasing behavior.

7. Limitations and future research

This study has some limitations. Although the sample of students was diverse throughout the country, the convenience sampling method was used. The findings are applicable Gen Z consumers faced with the lockdown and the pandemic and therefore can be generalized to the Greek students' population to a certain extent. The findings focus students 14–17 years old and thus may not capture the whole range of Gen Z consumers.

Moreover, despite emerging research insights in the field of internet and social media behavior, there is still a long way to go in understanding the link between personality traits and online consumer behavior (Chen and Roberts, 2019). The present study addresses an issue that has received limited research scrutiny i.e. how the personality traits affect consumer behavior under stressed life conditions such as the Pandemic (Mourelatos, 2021). During this period individuals – on average – increased their internet use and social media purchases, possibly because they found the opportunity and the potential to balance or enhance their well-being (Chahal *et al.*, 2020; Amichai-Hamburger and Ben-Artzi, 2003; Amichai-Hamburger, and Schneider, 2014) but also experienced discontinuance intentions (Liu *et al.*, 2021). Also, by using self-reports of social media behavior before and during the Pandemic, it was revealed that personality differences may explain why some consumers' segments increased their online presence, while others decreased it intensely (Wang, 2001). In the same vein, resilience and vulnerability also explain consumer online behavior during the pandemic.

Although this study is one of the first to explore resilience, vulnerability and personality as key determinants of young consumers' online purchase intentions, future research might also, embed additional personal variables, such as optimism, depression and stress perceptions during an exogenous life shock as COVID-19. Also, these constructs should also be applied to other generations. Considering the rapid adoption of online technologies during COVID-19 and the assumption that some of these changes may be permanent, future research can focus on the persistence of these changes and the reconfiguration of consumer segments attributed to COVID-19 pandemic. Finally, other social media platforms (i.e. Tik-Tok) may provide important insights, while cross-cultural research is also fruitful. To conclude, personality is an important determinant of consumers' online behavior, while

different platforms engage are also likely to engage consumers in a distinct manner. In the future, societal changes are likely to affect consumers to a great extent, while research should keep on tracking the key determinants of online consumer behavior.

Notes

1. The American Psychological Association (APA) reports 81% of Gen Z teens (ages 13–17) have experienced more intense stress during the COVID-19 pandemic.
2. Before that, we ran a small-scale online survey in a crowdsourcing platform, to validate that the flow of the online questionnaire was efficient (Mourelatos *et al.* 2016).
3. The minimum inclusion criteria for our sample required that individuals must have made at least one online purchase via the internet and one through social media within the past six months.
4. The Family Affluence Scale (FAS) – an established measure of wealth and socio-economic status level that is easy for students to answer (Currie *et al.* 1997) – is used to measure participants' social economic background. This social economic measurement consists of 6 items with a Likert scale form of answering and has a summarized value range from 0 to 13. In the present study, the FAS was used as a dichotomous variable by containing students with low and high FAS levels.
5. Openness refers to the tendency to be creative and unconventional, conscientiousness to the tendency to be organized and disciplined, extraversion to the tendency to be sociable and active, agreeableness to the tendency to be trusting and modest and neuroticism to the tendency to experience negative emotions.

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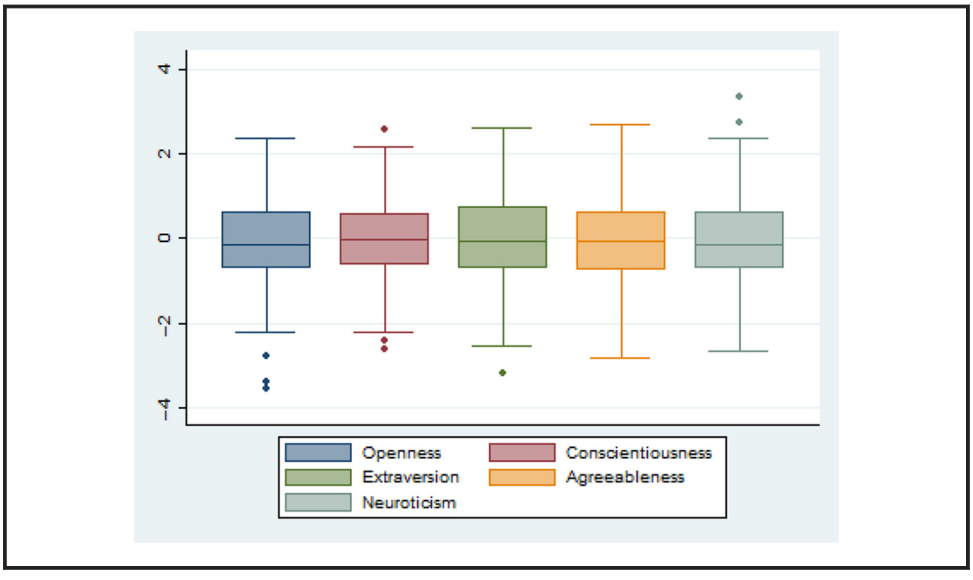
Appendix

Figure A1 Personality traits distribution



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