TUDelft

Delft University of Technology

Consumer emotions and collaborative consumption

The effect of COVID-19 on the adoption of use-oriented product-service systems

de Medeiros, Janine Fleith; Marcon, Arthur; Ribeiro, Jose Luis Duarte; Quist, Jaco; D'Agostin, Andressa

Important note
To cite this publication, please use the final published version (if applicable).
Please check the document version above.

Journal Pre-proof

Consumer emotions and collaborative consumption: the effect of COVID-19 on the adoption of use-oriented product-service systems

Janine Fleith de Medeiros , Arthur Marcon ,
Jose Luis Duarte Ribeiro , Jaco Quist , Andressa D' Agostin

Please cite this article as: Janine Fleith de Medeiros , Arthur Marcon , Jose Luis Duarte Ribeiro , Jaco Quist , Andressa D' Agostin , Consumer emotions and collaborative consumption: the effect of COVID-19 on the adoption of use-oriented product-service systems, *Sustainable Production and Consumption* (2021), doi: https://doi.org/10.1016/j.spc.2021.03.010

1 **Consumer emotions and collaborative consumption: the effect of COVID-19 on the**
2 **adoption of use-oriented product-service systems**

3 Janine Fleith de Medeiros [a, b*] (ORCID: 0000-0002-5060-0632);
4 Arthur Marcon [a] (ORCID: 0000-0003-0334-3853);
5 Jose Luis Duarte Ribeiro [a] (ORCID: 0000-0002-5795-4468);
6 Jaco Quist [c] (ORCID: 0000-0002-6365-4082);
7 Andressa D'Agostin [b] (ORCID: 0000-0002-1611-7081).
8
9 [a] Graduate Program on Industrial Engineering, Department of Industrial Engineering and
10 Transports, Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre (Rio Grande do
11 Sul), Brazil.
12
13 [b] Graduate Program on Business Administration, Universidade de Passo Fundo, Rodovia BR
14 285, Km 292,7, S/n - São José, Passo Fundo - RS, 99052-900, Brazil
15
16 [c] Delft University of Technology, Faculty of Technology, Policy & Management, Postbus 5015,
17 NL-2600 GA Delft.
18
19 [*]**Corresponding author**:
20 Janine Fleith de Medeiros. *Email*: janine@upf.br. *Address*: Universidade de Passo Fundo,
21 Rodovia BR 285, Km 292,7, S/n - São José, Passo Fundo - RS, 99052-900, Brazil.
22

23 **Abstract**

24 The COVID-19 pandemic is expected to widely change how consumers evaluate market
25 offerings. In this research, we identified consumers' emotions on the adoption of use-
26 oriented Product-Service-Systems (PSS) and the effect of COVID-19 on such emotions
27 using pre- and amid-COVID-19 samples. The results indicate that positive emotions are
28 generally more associated with the process of adopting use-oriented PSS. However, the
29 negative effect of COVID-19 on emotions influencing the decision to use the PSS is
30 significant. We found that during the pandemic, consumers moved from the positive
31 side of emotions to the more negative one. The emotions with the highest frequencies in
32 pre-COVID-19 data collection (sympathy, joy, and peacefulness) suffered a significant
33 descent effect due to the pandemic. Also, negative emotions such as fear, shame, and
34 guilt, which were already present in the pre-COVID-19 phase, showed an increase in
35 manifestations in the amid-COVID-19 sample. COVID-19 has increased self-interest in
36 people, and emotions that predict altruism and concern for society were affected. We
37 also found that previous use experience as well as gender and education do not
38 significantly moderate the effect of COVID-19 on consumption emotions, although
39 these demographic variables have been confirmed in other studies as important
40 moderators in pro-environmental consumption. Finally, the results demonstrated that
41 younger people (between 18 and 24 years old) tend to be more impacted by pandemic.
42 Theoretically, our study contributes (1) by using an emotions scale specifically
43 developed for consumption situations, allowing to assess a greater amount of emotions,
44 (2) by analysing basic emotions, in addition to the self-conscious ones, that interfere in
45 the adoption of use-oriented PSS, and (3) by confirming that an external traumatic event
46 alters consumption-related emotions.
47 **Keywords:** sustainable consumption; consumption emotion set; Sars-Cov2; pandemic; sharing
48 economy.

49

50 **Declarations**

18 **Abstract**

19 The COVID-19 pandemic is expected to widely change how consumers evaluate market
20 offerings. In this research, we identified consumers' emotions on the adoption of use-oriented
21 Product-Service-Systems (PSS) and the effect of COVID-19 on such emotions using pre- and
22 amid-COVID-19 samples. The results indicate that positive emotions are generally more
23 associated with the process of adopting use-oriented PSS. However, the negative effect of
24 COVID-19 on emotions influencing the decision to use the PSS is significant. We found that
25 during the pandemic, consumers moved from the positive side of emotions to the more
26 negative one. The emotions with the highest frequencies in pre-COVID-19 data collection
27 (sympathy, joy, and peacefulness) suffered a significant descent effect due to the pandemic.
28 Also, negative emotions such as fear, shame, and guilt, which were already present in the pre-
29 COVID-19 phase, showed an increase in manifestations in the amid-COVID-19 sample. COVID-
30 19 has increased self-interest in people, and emotions that predict altruism and concern for
31 society were affected. We also found that previous use experience as well as gender and
32 education do not significantly moderate the effect of COVID-19 on consumption emotions,
33 although these demographic variables have been confirmed in other studies as important
34 moderators in pro-environmental consumption. Finally, the results demonstrated that younger
35 people (between 18 and 24 years old) tend to be more impacted by pandemic. Theoretically,
36 our study contributes (1) by using an emotions scale specifically developed for consumption
37 situations, allowing to assess a greater amount of emotions, (2) by analysing basic emotions, in
38 addition to the self-conscious ones, that interfere in the adoption of use-oriented PSS, and (3)
39 by confirming that an external traumatic event alters consumption-related emotions.

40 **Keywords:** sustainable consumption; consumption emotion set; Sars-Cov2; pandemic; sharing
41 economy.

42

43 **1. Introduction**

44   The COVID-19 pandemic has shocked the world and has significantly affected health,
45 as well as the economic and social spheres (Cohen, 2020; Majumdar, et al., 2020; Sarkis et al.,
46 2020). Studies show that the SARS-CoV-2 virus, which causes COVID-19, is transmitted through

1 personal contact with contaminated secretions by persons who cough or sneeze, through the
2 inhalation of airborne virus particles, or through contact with a contaminated surface (World
3 Health Organization, 2020). According to recent research, the virus remains alive for up to 24
4 hours in cardboard packaging and up to three days on plastics and stainless steel (Malik et al.,
5 2020; Uddin et al., 2020). Thus, in addition to social distancing, washing hands and wearing
6 face cover, cleaning environments, and avoiding object sharing are essential practices to
7 prevent infection (Ingrassia et al., 2020). The latter issues posit major challenges to
8 collaborative consumption offerings, such as Product-Service Systems (PSS).

9 PSS have been related to collaborative consumption (Piscicelli et al., 2015), the sharing
10 economy and are considered a Circular Economy strategy (e.g. Geissdorfer et al., 2018). PSS
11 are defined or described as a business model characterized by the integration of products and
12 services designed to meet consumer needs in a sustainable way, reducing resource
13 consumption and environmental impacts (Annarelli et al., 2016; Qu et al., 2016). Three PSS
14 categories can be distinguished: (i) product-oriented PSS; (ii) use-oriented PSS; and (iii) result-
15 oriented PSS (Tukker and Tischner, 2006)[1]. In this paper, the focus is on use-oriented PSS,
16 which are in line with the principles of the sharing economy (Reim et al., 2015).

17 Use-oriented PSS are grounded on the idea that consumers are not necessarily looking
18 for a material product, but for its usefulness, function, value, or provided service (Qu et al.,
19 2016; Kanda and Matschewskya, 2018). Thus, use-oriented PSS can be understood as a
20 possibility of consumption in which the service provider, who may or may not be the original
21 manufacturer, maintains product ownership, while consumers pay to use it for a
22 predetermined period (Tukker, 2004). Examples of business to consumer use-oriented PSS
23 include bike and scooter sharing services, ride-hailing (or ride-sharing) offers based on
24 smartphone applications, printing solutions where consumers pay based on the number of
25 copies (rather than for the printer), and co-working spaces[2] (Bouncken et al. 2020). Use-
26 oriented PSS offerings involve renting or sharing objects or even making privately-owned
27 products available to people within a community (Piscicelli et al., 2015). This type of business
28 model is strongly focused on sustainability and a circular economy since it aligns
29 environmental interests with positive social and economic impacts (Tukker and Tischner, 2006;
30 Piscicelli et al., 2015).

31 Over the last decade niche markets for various PSS have emerged and have been
32 related to the sharing economy (Schorr, 2014) and to sustainable consumption (Piscicelli et al.,
33 2015). These PSS niches are growing quickly, and they are considered as essential for
34 transitions to sustainability and a circular economy in many areas of production and
35 consumption (Frenken and Schor, 2019). However, according to Catulli et al. (2017), Akbar and
36 Hoffmann (2018), and Mashhadi et al. (2019), the adoption rates for use-oriented PSS are still
37 low, and academic studies are needed to increase our understanding of underlying consumers'

---

[1] In product-oriented PSS the manufacturer provides additional services, such as maintenance and guarantee, in order to assure proper product performance for a predetermined period of time. In use-oriented PSS, the service provider, who may or may not be the original manufacturer, retains ownership of the product and clients pay to use the product and its functions for a predetermined period. Result-oriented PSS, it is focused on a service that replaces a given product (for instance, instead of renting a washing machine, families can have access to a laundromat service) (Tukker, 2015).

[2] Leasing services are also considered to be use-oriented services, but do generally not allow for sharing and are not part of collaborative consumption practices. Therefore, leasing is left out, as it does not or considerably less affected by the COVID-19 related emotions addressed in this paper

1 motivations and choices. Moreover, during the COVID-19 pandemic scenario, consumption
2 based on sharing may be associated by consumers with greater contamination risks.

3 To make things more complicated, consumers are subject to a wide variety of
4 psychological and social needs that are significantly distant from their survival needs
5 (Schiffman and Kanuk, 2014). Emotional elements have an important role in consumers'
6 decision-making processes (Ghorbani et al., 2013), and are crucial for the future of
7 collaborative consumption (Fraanje and Spaargaren, 2019). Nevertheless, studies that address
8 the impact of use-oriented PSS on consumers' emotions are scarce. In this sense, mapping
9 consumers' feelings is of great importance since most studies on pro-environmental behaviour
10 employ the Theory of Reasoned Action (TRA) (Ajzen et al., 1980) or the Theory of Planned
11 Behaviour (TPB) (Ajzen, 1991) as theoretical frameworks, such as the works of Paul et al.,
12 (2016), Liobikienė et al., (2016), and Ghose and Vision (2020).

13 Therefore, consumer behaviour theories that encompass emotions can play a key role
14 in the research regarding decision-making processes for green products (Choi and Johnson,
15 2019; Jung et al., 2020). They can provide, for example, a greater understanding of the
16 emotional mechanisms that drive non-green consumers into buying or adopting green
17 products (Cheung et al., 2019; Ali et al., 2020). Research investigating emotions in consumer
18 behaviour also tends to make communication practices and even regulatory policies more
19 effective (Preziosi et al., 2019; Beatson et al., 2020). Various brain structures process
20 information and our decision-making process involves both reason and emotion (Sleenhoff et
21 al., 2015). These two systems communicate with each other, impacting behaviour together
22 (Dolan, 2002; Rustichini, 2005). Therefore, the decision-making process cannot be described as
23 exclusively rational and conscious as it is affected by emotional and subjective elements
24 (Zaltman, 2003).

25 Research indicates that the pandemic has affected our feelings and emotions (Ahorsu
26 et al., 2020; Dymecka et al., 2020; Tull et al., 2020). Moreover, we still do not precisely know
27 whether consumers' emotions related to use-oriented PSS altered due to the COVID-19
28 pandemic. Research has not addressed the impact of the COVID-19 pandemic on consumers'
29 consumption-related emotions. Therefore, we aim to identify the relationship between use-
30 oriented PSS adoption and consumers' emotions, and the effect of COVID-19 on such
31 emotions. To that end, we raise the following questions, which guided our research: (1) Which
32 consumers' emotions are associated with the decision-making process for the adoption of use-
33 oriented PSS?, (2) Has the pandemic changed consumers' emotions towards use-oriented
34 PSS?, and if so, (3) What is the impact of COVID-19 on consumers' emotions towards use-
35 oriented PSS?

36 We justify the theoretical validity of our research by the use of a scale specifically
37 developed to investigate consumption emotions. Consumption Emotion Set Scale (CES)
38 presents a broader set of emotions and sentiments compared to scales from psychology,
39 which are usually employed (Cardello and Jaeger, 2016). Furthermore, the analysis of
40 published research on the influence of emotions on pro-environmental behavior shows that
41 the influence of emotions on pro-environmental consumption behavior focuses generally on
42 only one or two self-conscious emotions (Onwezen et al., 2013 and 2014; Piscicelli et al., 2015;
43 Jiang et al., 2020, among others). Hence, this paper advances the scientific literature by
44 analysing whether basic emotions influence consumers' motivations and assessments
45 regarding use-oriented PSS adoption. In addition, long-term behavioural, economic, and social
46 changes tend to occur after the crisis gets controlled (Sarkis et al., 2020). Therefore, increased

1 understanding of the impact of COVID-19 on use-oriented PSS consumption-related emotions
2 is important for researchers, when studying the rise of collaborative consumption (Echegaray,
3 2021).

4   Methodologically, this study can be characterized as descriptive (Malhotra, 2009), with
5 a multiple transversal approach since our data derive from two distinct sample collections (one
6 prior to the existence of COVID-19 and one amid the COVID-19 pandemic). Structurally, section
7 2 presents the theoretical background and hypotheses. Section 3 describes the method of data
8 collection and analysis. The results are covered in section 4. Section 5 discusses the
9 implications of the results obtained. Finally, section 6 summarizes the conclusions, research
10 limitations and suggestions for future studies.

11

12 **2. Theoretical Background and Hypotheses**

13 **2.1 Emotions and Consumer Behaviour**

14   Consumer behaviour research shows that emotions play an important role in
15 consumer decision-making processes, as well as in developing and maintaining preferences for
16 specific products, both goods and services (Zaltman, 2003; Shiv, 2007; Kenrick et al., 2013).
17 Essentially, consumers tend to like or regret their choices (Oliver, 1994). Moreover, individuals
18 tend to associate deep feelings like happiness, fear, love, hope, pride, sadness, or fantasy, with
19 certain purchases or product usage (Holbrook and Hisrchman, 1982; Pham et al., 2001).
20 Therefore, affective responses influence processes, such as assessment, memory, judgment,
21 and risk perception (Gardner, 1985; Dolan, 2002; Rustichini, 2005).

22   Research by Carrus et al. (2008), Swim et al. (2011), and Menzel (2013) identified that
23 emotions play an important role in choosing green offerings. Similarly, Meneses (2010) found
24 that sustainable consumption is more correlated with emotions than with cognition. According
25 to Harth et al. (2013) and Wang and Wu (2016), an emotion may predict specific types of pro-
26 environmental behaviour. Most existing studies on the theme focus primarily on emotions
27 such as guilt and pride, which are self-conscious emotions[3].

28   Onwezen et al. (2013 and 2014), and Antonetti and Maklan (2014a and 2014b) found
29 that guilt and pride tend to be relevant emotions to motivate the choice for green products.
30 Onwezen et al. (2013) confirmed that anticipated pride and guilt are emotions with a self-
31 regulatory function that mediate the effects of personal norms on behaviour. Antonetti and
32 Maklan (2014a and 2014b) found that feelings of guilt and pride can regulate sustainable
33 consumption by affecting consumers' general perception of effectiveness. Interestingly, Kim et
34 al. (2013) and Peloza et al. (2013) state that the preference for a product promoted through
35 ethical appeals is motivated by the desire to avoid anticipated guilt. Theotokis and Manganari
36 (2015) examined the architecture of choice between on the one hand options in which green
37 services need to be requested (opt-in), and on the other hand options in which green services
38 are implicit (opt-out). In this case, opt-out options are more effective, as they increase
39 consumers' anticipated guilt. For Jiang et al. (2020), anticipated guilt has a positive and direct
40 impact on the intention of low-carbon consumption behaviour. Liang et al. (2019) found that
41 positive emotions like pride and gratitude are related to pollution prevention and green

[3] Those emotions that involve relationships between the individual and the other, since guilt, pride and shame (Lagattuta and Thompson, 2007).

purchase intent. By contrast, negative emotions like guilt and condemnation of others are only related to the intention to buy green products. In addition, Amatulli et al. (2019) identified that messages with negative framing are more effective than messages with positive framing to encourage individuals to engage in pro-environmental behaviours. Anticipated shame is the emotion responsible for this effect.

Although self-conscious emotions are ideal predictors of moral behaviour like in sustainable consumption, while basic emotions like joy, anger, and fear also affect consumers' green decision processes (Kolling et al, 2020; D'Agostin et al., 2020b). According to Harth et al. (2013), in a study investigating the emotion of anger, responsibility within the group for environmental damage tends to increase anger, driving intentions of punishment. Wang and Wu (2016) also confirmed that anger, in addition to pride, guilt, and respect, interferes with significant choices in sustainable consumption. Hwang and Kim (2016) found that joy can motivate the purchase and repurchase of environmentally sustainable products, not out of empathy but out of narcissism. Singh et al. (2018) assessed the effect of fear and anger on consumers' ethical judgment and found that people in the state of incidental fear exhibit higher levels of ethical judgment than individuals in the state of incidental anger. For Dong et al. (2018), the love of possession and individuals' materialism positively affects the sustainable consumption behaviour of durable products. Kolling et al. (2020) mapped out that sympathy (for those who buy green products), pride (for buying green products), and joy (for knowing that green products are available) were the emotions most associated with purchasing green products. D'Agostin et al. (2020b) identified that envy, guilt, frustration, and concern are feelings associated by young people when they must use disposable cups.

Regarding the study of emotions in the context of the use-oriented PSS, previous results indicate the positive and the negative influence of emotions throughout consumers' adoption processes, although no studies have addressed this issue. Nevertheless, Piscicelli et al. (2015) state that guilt favours use-oriented PSS adoption. Armstrong et al. (2015), Catulli et al. (2017), Akbar and Hoffmann (2018), and Mashhadi et al. (2019) emphasize that altruism and social awareness tend to motivate the adoption of use-oriented PSS. By contrast, Akbar and Hoffmann (2018) identify that the fear of non-ownership, and consequent lack of exclusivity, increases resistance to use-oriented PSS adoption. Other authors have also found that feelings of ownership associated with different products tend to increase consumers' resistance to the adoption of use-oriented PSS (Piscicelli et al., 2015; Tukker, 2015; Annarelli et al., 2016; Schmidt et al., 2016; Catulli et al., 2017, among others). Finally, the disbelief about the benefits that shared use generates for the environment, society and the economy (Kristensen and Remmen, 2019), shame (not knowing how to use the product) (Schmidt et al., 2016), and insecurity (Schorr, 2014; Catulli et al., 2017) may inhibit the adoption of use-oriented PSS.

Figure 1 summarizes the main conclusions of subsection 2.1. Although studies have been carried out, there is still a limited view of emotions and their relationship with decision-making behaviours related to environmentally sustainable consumption.
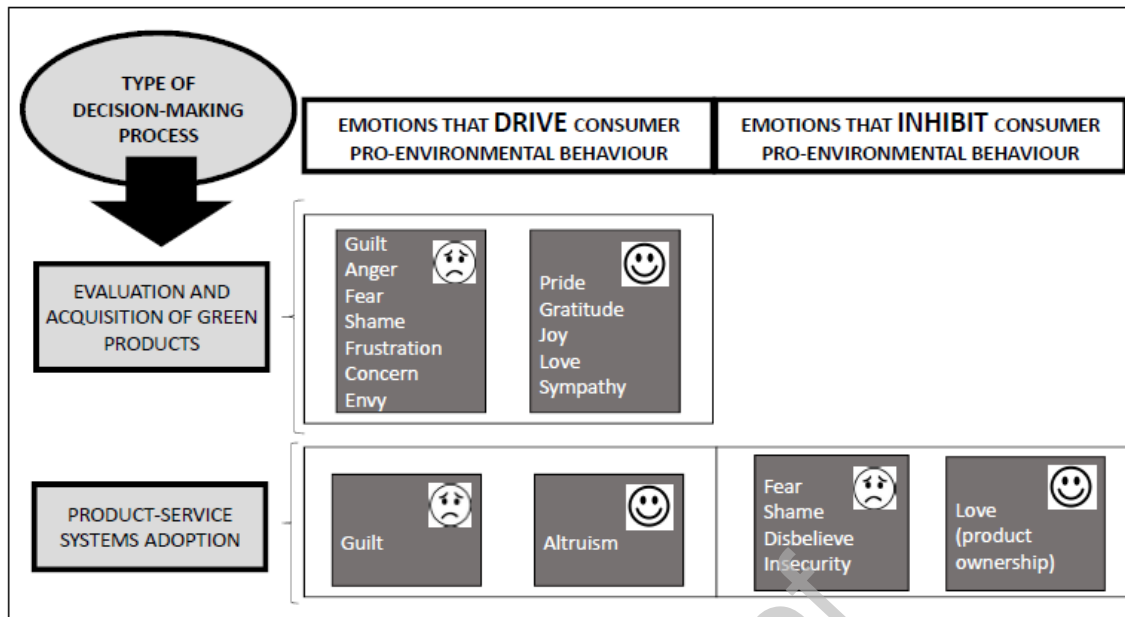
Figure 1 – Summary of previous literature findings

2.2 Assessing Emotions in Consumer Decision Processes

Although the Theory of Planned Behaviour (TPB) (Ajzen, 1991) is relevant for the study of pro-environmental behavior, it has limitations (Kim et al., 2013; Jiang et al., 2020). For instance, TPB does not consider emotions that play an important role in behavioural intention and attitude (Menzel, 2013; Bangsa and Schlegelmilch, 2020). This results in a limited reflection of reality, since it describes and characterizes consumer behaviour as predominantly cognitive (Araña and Leon, 2009).

Theoretically, several conceptual explanations for the term "emotions," their formation and decoding processes have been proposed. In this sense, according to Erevelles (1998) and Watson and Spance (2007), two theoretical streams are commonly addressed in consumer behaviour to defend the origin of emotions: one that favours the cognitive-affective process (cognitive theory) and another one proposing that affection and cognition can occur separately (independence theory).

The present study follows the concepts related to the cognitive theory of emotions. This is especially supported by results from the study of Anand et al. (1988), where the comparison between the two theoretical approaches supports the cognitive-affective model over the independence model. Also, it is justified on the fact that the cognitive-affective model is more prominent nowadays, for instance (Ruth et al., 2002; Gaur et al., 2014; Achar et al., 2016).

According to the cognitive theory of emotions, the occurrence of an emotion depends on the cognitive interpretation of a physiological state (Lazarus, 1991). Therefore, the situation's cognitive assessment determines which emotion must be experienced (Derbaix et al., 2012). Specifically, regarding consumption, emotions can be described as affective responses caused by the experience lived (Holbrook and Gardner, 2000; Achar et al., 2016). Emotion concerns a mental state of readiness from cognitive appraisals of situations or thoughts (Bagozzi et al., 1999). Emotions are similar to a cognitive system, which results from

1   the analysis made by individuals of the significance of a given event on their wellbeing (Ruth et
2   al., 2002; Koshkaki and Solhi, 2016).

3   Considering the metrics used to assess emotions in consumer behavior, some studies
4   use scales derived from psychology (Cardello and Jaeger, 2016). Nevertheless, the psychology-
5   originated scales are not prepared to analyse emotions related to purchase decision processes
6   (Lichtlé and Plichon, 2014). Therefore, in the present study, we choose to use the Consumption
7   Emotion Set (CES) Scale as our reference. The CES scale was developed by Richins (1997), and
8   its specific aim is to measure consumption-related emotions. It includes a set of descriptors
9   representing the emotions that individuals most often experience during the purchase and
10   consumption of different types of products. It is composed of 47 emotion descriptors,
11   distributed in 17 factors (see Annex A).

12   The CES list of factors and descriptors contemplates both positive and negative
13   emotions. In fact, in studies regarding the structure of feelings, the distinction between
14   positive and negative emotions constantly emerges as the two dominant and relatively
15   independent dimensions (Watson et al., 1988; Gaur et al., 2014). Positive emotions are those
16   associated with reaching objectives (those that involve attraction, approximation, or positive
17   behaviour), whereas negative emotions result from eventual failures or problems, comprising
18   escape, retreat, or negative behaviour (Pham, 1998; Bagozzi et al., 1999; Duhachek, 2005).

19   Although other scales have been developed afterward (Honea and Dahl, 2005; King
20   and Meiselman, 2010; Lichtlé and Plichon, 2014), CES has the most comprehensive structure to
21   measure emotions throughout the purchase and consumption experiences (Laros and
22   Steenkamp, 2005; de Medeiros et al., 2010). This conclusion is justified since CES elaboration
23   observes the identification of emotion descriptors that are familiar and readily understood by
24   consumers. Additionally, CES applicability range that covers distinct purchasing processes.
25   Therefore, we believe that CES's use will enable the identification of emotions related to the
26   adoption of use-oriented PSS in a more comprehensive, appropriate, and holistic way.

27   **2.3 Research Hypotheses**

28   Studies prior to the COVID-19 pandemic indicated that sanitary issues could inhibit the
29   adoption process for use-oriented PSS. For instance, Armstrong et al. (2015) identified that
30   hygiene-related aspects could limit consumers' adherence to business models focused on
31   clothing sharing. According to Edbring et al. (2016), the hygiene concern was one of the
32   motivators for collaborative consumption to increase acceptance of rarely used products. In
33   the COVID-19 scenario, in which attention should be paid to cleaning shared spaces and
34   objects (Ingrassia et al., 2020), this feeling of concern may increase in the processes of
35   consumer adhesion to use-oriented PSS.

36   Research has also identified other negative emotions related to the adoption of use-
37   oriented PSS, such as insecurity and fear. Regarding insecurity, Schorr (2014) pointed out that
38   one of the common drivers among people who adhere to sharing offers is the desire to
39   increase social connections. However, many tended to feel insecure and disappointed since
40   the transaction parties often do not know each other due to remote access (such as car
41   sharing, for example). For Catulli et al. (2017), using consumer culture theory, the adoption of
42   use-oriented PSS is hindered by insecurity since we usually do not know the subjects with
43   whom we will share the offer. In addition, Marko et al. (2020) highlight that the exposure that
44   everyone has to the effects and risks arising from COVID-19 increases the effects on our

1 mental health, further deepening the feelings of uncertainty that tend to trigger generalized
2 insecurity.

3   Ahorsu et al. (2020) highlight that the proliferation of COVID-19 tends to increase
4 people's feelings of fear. These authors point out that due to the disease's infectious nature,
5 fear tends to be manifested, leading to other psychosocial challenges, such as stigmatization
6 and discrimination. Yang et al. (2018) found that fear generated by infectious diseases
7 motivates people to protect themselves and produces negative bio-social-psychological
8 effects. In their research carried out after the World Health Organization declared a global
9 health crisis due to the Zika Virus, the interviewees (women of childbearing age), reported
10 being afraid at levels similar to those reported after other crises or significant disasters (such
11 as the 9/11 terrorist attacks). These findings suggest that the COVID-19 pandemic (as a global
12 health crisis) may negatively impact consumers' emotions to consumption too.

13   Regarding negative emotions, Kim and Cameron (2011), conducted an experiment that
14 investigated people's emotional response to a corporate crisis (a cell phone explosion
15 accident), and confirmed that consumers experience anger and sadness in such situations.
16 Vázquez and Hervás (2010) found that feelings of anger were unleashed in the population after
17 the terrorist attacks of March 11, 2004 in Madrid. Li et al. (2017) point out that there are
18 different emotional responses (for example, anxiety and anger) to an unexpected event and its
19 sub-events, for which the researchers analysed the behaviour of people on social media after
20 the Japanese earthquake in 2011, the earthquake in Haiti in 2010 and during the H1N1
21 pandemic in 2009.

22   Other studies indicate that in addition to negative emotions, positive emotions can
23 emerge and motivate actions in crisis situations. According to Kim and Niederdeppe (2013), in
24 a study with students at a university that suffered an outbreak of H1N1, positive emotions
25 were more present than negative emotions. According to these authors, feelings like
26 satisfaction and fulfilment (among those who helped with the crisis management work), as
27 well as calm and hope, were verified. Similarly, Vázquez and Hervás (2010) also found a range
28 of positive emotions after the terrorist attacks of March 11 in 2004. Among such feelings, the
29 authors highlight strength, excitement, pride, and joy.

30   Finally, in light of the previous findings addressing emotions after negative events, and
31 given the shared nature of use-oriented PSS, the COVID-19 pandemic crisis is expected to have
32 changed how consumers relate emotionally to this type of consumption, mainly due to the
33 transmission characteristics of the disease. Hence, we propose the first research hypothesis
34 as:

35

36   *H1 – Consumers' emotions towards use-oriented PSS have changed due to the COVID-*
37 *19 pandemic.*

38

39   The relationship between emotions, perceived risk, and past experiences must be
40 considered (Blackwell et al., 2011). Conceptually, perceived risk covers the fundamental issues
41 of "uncertainty" and "consequences" (Bauer, 1960; Cox, 1967; Bateson, 1995). Consumer risk
42 requires the existence of uncertainty regarding the results of possible actions (Yates, 1992).
43 Schiffman and Kanuk (2014) summarize six types of perceived risks addressed in the literature,

with their degree of importance alternating due to the type of product purchased: (i) financial - loss of money through the comparison between the total perceived value and the total perceived cost; (ii) physical - problems associated with the health or safety of consumers during purchase or consumption; (iii) social - consumers' perception of how others will react to their consumption; (iv) performance - refers to functionality, how well the product will perform the necessary technical functions; (v) psychological - how consumers perceive themselves after purchasing in terms of self-image and self-concept or insecurity; and (vi) time - the possibility of a decision-making process taking too long or resulting in a loss of time.

In the purchase of environmentally sustainable products, studies have identified that consumers mainly perceive risks of performance (Ewing and Sarigöllü, 2000; Jena and Sarmah, 2015; de Medeiros et al., 2016). According to Luchs et al. (2010), when functional attributes are decisive for consumers' decisions, the preference for environmentally sustainable offers is reduced. In studies that investigated the adoption of use-oriented PSS, in addition to the issue of performance results of Piscicelli et al. (2015), Schulte and Voß, (2015), Annarelli et al. (2016), and Akbar and Hoffman (2018), papers also address the psychological risk due to uncertainty. Additionally, Armstrong et al. (2015) and Edbring et al. (2016) identified the perception of physical risk related to sanitary issues.

However, studies carried out in different segments indicate that positive experiences reduce perceived risk and favour repurchase (Mittal et al., 1998; Snoj et al., 2004; Tavitiyaman and Qu, 2013). This mainly occurs when individuals perceive additional value (Sweeney et al., 1999; Kumar et al., 2010). For example, Liang et al. (2018) discovered that when searching for repurchase intentions associated with a product resulting from the sharing economy, perceived value positively increases intention to repurchase. Additionally, Lin and Chan (2019) found that more frequent users of sharing platforms have less security and performance uncertainty. Huarng and Yu (2019) found that while traditional hotels outperform Airbnb in terms of services hosting, experiences, and satisfaction, Airbnb generates much higher perceived value than hotels, making the satisfaction achieved reduce all the risks that were associated with the choice of initial purchase.

In stress contexts, a study by Sönmez and Graefe (1998) found that positive feelings related to previous trips tend to decrease risk perception for future trips, even if such trips are to unsafe regions. Batra et al. (2012) identified that positive emotional connection, trust, passion, suffering predicted by separation, and long-term relationship predict consumer resistance to negative episodes with brands or consumer objects. Floyd et al. (2004) examined the relationship between perceived risk and travel intentions of New York residents right after 9/11 and found that positive past experiences reduced risk perception and negative emotions. Therefore, both the results of Sönmez and Graefe (1998), Batra et al. (2012), and Floyd et al. (2004) provide evidence of the effect of consumers' previous consumption experience on their emotions. Concerning the effect of COVID-19, Matiza (2020) identified that consumers tend to perceive less risk in domestic than international travel. According to the author, individuals feel safer "inside" what they are more familiar with, reducing the perception of psychological, social, and physical risk.

Based on previous studies regarding emotions on consumption and consumers' previous experience, we assume that consumers are already used to consuming use-oriented PSS tend to be less affected in emotions and feelings related to consumption during the pandemic. In other words, we theorize an interaction effect between previous experience with

1 PSS and COVID-19 on consumers' emotions. Therefore, our second research hypothesis posits
2 that:

3

4 *H2 – The effect of previous consumption of (or experience with) use-oriented PSS*
5 *offerings on consumers' emotions is moderated by COVID-19.*

6

7 Since personal factors, such as gender, age, and education tend to interfere with
8 consumers' decision-making processes (Solomon, 2014), we believe it is important to assess
9 their impact on consumers' emotions when moderated by the COVID-19 pandemic. Therefore,
10 a point to be investigated focuses on the difference in behaviour between genders. The
11 division between the genders is normal, natural, and inevitable (Bourdieu, 2016). The author
12 describes that the division is objectively presented in things (as in the house, where the parties
13 are sexed) and throughout the social world. In the marketplace, gender has always been a
14 differential segmentation variable, with gender identity being a very important component of
15 the subject's self-concept as a consumer (Solomon, 2014).

16 According to Baudrillard (1998), in the consumer society, the object itself is never
17 consumed. Instead, objects are manipulated as signs that distinguish individuals. From the
18 perspective of gender, Baudrillard (1998) points out that, in consumption, the male model is
19 the requirement and choice, while the female model describes the need for "with pleasure".
20 Underhill (2009) highlights that even today, after the consolidation of the feminist movement,
21 women continue to prioritize the valuing of community goals (such as affiliation and the
22 promotion of harmonious relationships), while men prioritize individual goals (which
23 emphasize self-assertion and dominance).

24 For pro-environmental behaviour, a series of surveys allows us to generalize that
25 women are more likely to buy sustainable (green) products and to participate more frequently
26 in other actions that demand behaviour change (for example, recycling and conservation of
27 energy and resources) (Mostafa, 2007; do Paço et al., 2009; Chekima et al., 2016). By contrast,
28 men tend to have greater knowledge about environmental issues than women (Straughan and
29 Roberts, 1999; Boztepe, 2012). Besides, women tend to more carefully consider the impact of
30 their actions on others (Eagly, 1987) and are therefore more likely to maintain attitudes
31 consistent with the environment (Mostafa, 2007; Chekima et al., 2016). Analysing gender
32 differences in the adoption of use-oriented PSS, D'Agostin et al. (2020a) found that the gender
33 effect is significant on drivers. Specifically, variables associated with a sustainable and healthy
34 lifestyle and the compatibility between values and availability tend to influence women more
35 than men.

36 Regarding traumatic situations, Lin et al. (2011) and Suresh et al. (2011) identified that
37 the adherence of women to the H1N1 vaccination in the post-pandemic period was
38 significantly higher than that of men. This finding may suggest a difference in behaviour during
39 pandemic experiences among genders. Furthermore, González-Sanguino et al. (2020), in a
40 study that reported the psychological impact of COVID-19 in a sample of the Spanish
41 population, identified that women manifested more symptoms associated with depression,
42 anxiety, and post-traumatic stress (PTSD) than men. Additionally, Bodecka et al. (2021), when
43 assessing the moderating role of gender in the relationship between the hedonistic
44 perspective of the present time and the development of depressive symptoms and stress

1   during the period of restrictions imposed by COVID-19, confirmed that the contemporary
2   hedonistic perspective would correlate negatively with psychological suffering in women, but
3   positively in men.

4   In sum, the effect of gender is expected to interact with the COVID-19 pandemic to
5   consumers' emotions related to the use-oriented PSS. In other words, the impact of COVID-19
6   on consumers' emotions is expected to depend on the consumer's gender. Thus, our third
7   research hypothesis proposes that:

8

9   *H3 – The COVID-19 pandemic moderates the impact of gender on consumers' use-*
10   *oriented PSS emotions.*

11

12   Concerning age, many studies that investigate environmentally sustainable purchasing
13   behaviour explore this demographic variable as an alternative to more effectively identify
14   target segments (Zhao et al., 2014; Yadav and Pathak, 2016). Most of the time, solutions to
15   environmental problems are a threat to changing values and behaviours, and it is natural for
16   younger people to support and accept ecological ideologies more easily than older people
17   (Straughan and Roberts, 1999). Although there is no consensus yet, many studies state that
18   younger people (especially millennials and Z generations[4]) are more sensitive to environmental
19   issues than older people, while also inclined to a more sustainable lifestyle (de Medeiros et al.,
20   2016; Lago et al., 2020). Consumer trends survey indicate that 65% of generation Z want to
21   know the origin of the product they intend to buy, while 75% of millennials expect sustainable
22   actions from organizations (ABIHPEC/SEBRAE, 2019).

23   Younger generations are presented to ecological awareness and knowledge at an early
24   age (Gan et al., 2008; Mahesh and Ganapathi, 2012). Regarding the sharing economy, there is
25   a growing consensus that the millennials adopted the mindset that access to goods and
26   services is more valuable than ownership, although awareness-raising communications are still
27   relevant (Godelnik, 2017). In the process of use-oriented PSS adoption, research identifies that
28   young consumers are more informed (D'Agostin et al. 2020a), engaged, and concerned (Sands
29   et al., 2020). Still on the age variable, Armstrong et al. (2015) concluded that PSS schemes with
30   experiential, innovative, and social approaches (for example, rent, exchange, and fashion
31   results) are perceived as ideal for younger consumers, while services that emphasize product
32   satisfaction (redesign, repair/maintenance, customization, consulting) are perceived as more
33   suitable for older consumers.

34   After discussing the differences between younger and older people in terms of pro-
35   environmental behaviour, we must also consider the differences between the youngest and
36   the oldest in the face of COVID-19. Norris (1992), in a study that examined the impact of 10
37   traumatic events, found that the age factor was decisive for post-traumatic stress disorder
38   (PTSD), with the greatest impact on younger people. Also, Amir and Sol (1999) identified that
39   exposure to one type of traumatic event increases psychological distress, while exposure to
40   various types of traumatic events is associated with decreased suffering. This fact helps us to
41   understand why more mature people tend to experience fewer negative emotions than
42   younger people in such situations. Losada-Baltar et al. (2020) found that younger women more

---

[4] Generation Y corresponds to people born between 1980-2000, and Generation Z encompasses consumers born between 2000-2010 (Kotler et al., 2014).

strongly expressed anguish, suffering, and loneliness during the outbreak of COVID-19. The elderly, with positive self-perception of aging, showed greater resilience in the face of the pandemic. Additionally, being in a more advanced age group, having economic stability, and believing that adequate information was provided about the pandemic are negatively related to depression, anxiety, and PTSD in Spanish people who experienced COVID-19 (González-Sanguino et al., 2020).

Given the above and knowing that consumers who are more involved with certain decision-making processes tend to link emotions to those processes (Blackwell et al., 2011), we consider that the pandemic's effects are expected to be higher on young consumers' behaviour. In other words, COVID-19 is expected to have impacted young consumers' emotions to a higher extent than other age groups. Therefore, our fourth hypothesis is:

H4 - The COVID-19 pandemic moderates the relationship between consumers' age and their emotions towards use-oriented PSS adoption. Therefore, young consumers' emotions are expected to be more affected by the pandemic than other age groups.

Finally, the effect of education level on consumers' emotions may also be moderated by the impact of COVID-19. Pioneering studies of people who are more likely to engage in pro-environmental behaviours have indicated higher education levels as relevant influencing variables (Anderson and Cunningham, 1972; Cornwell and Schwepker, 1992; Straughan and Roberts, 1999). Other studies also positively correlate higher educational levels with greater environmental concern and ecologically correct behaviour (Gan et al., 2008; Chekima et al., 2016; de Medeiros et al., 2016).

Focusing on the use-oriented PSS adoption process, Moro et al. (2018) found that residents of big cities, with a higher educational level, tend to be more motivated to use shared bicycles. The understanding that, by adopting PSS, individuals can contribute to the reduction of emissions is a recurring driver related to the cultural background (Edbring et al., 2016; Estrada et al., 2017; Kristensen and Remmen, 2019). Other studies have mapped out that consumer beliefs and culture could inhibit and hinder the adoption of use-oriented PSS (Annarelli et al., 2016; Catulli et al., 2017; Yin et al., 2018). Additionally, knowledge about the process of adopting PSS tends to favour adoption behaviour (Landry et al., 2018; Truelove et al., 2018; D'Agostin et al., 2020a).

Balkhy et al. (2010), when studying the awareness, attitudes, and practices related to H1N1, found that education level was the only significant predictor of the level of concern for H1N1. Latiff et al. (2012) found that educational level showed significant associations with patients' knowledge, attitudes, and practices in relation to the H1N1 pandemic and its prevention. In a similar vein, Lin et al. (2011), researching the Chinese public response to the H1N1 pandemic, identified that people with completed higher education had a higher risk perception and greater adherence to preventive behaviours. Also, Gao et al. (2020) mapped out that people with a lower educational level expressed more negative expectations regarding COVID-19.

Therefore, we propose that the impact of the level of education on consumers' emotions regarding the adoption of PSS is moderated by the COVID-19 pandemic. As such, our fifth hypothesis posits that:

1

2   *H5 – The COVID-19 pandemic moderates the relationship between consumers'*
3   *educational level on consumers' emotions towards use-oriented PSS adoption.*

4

5   **Figure 2** graphically presents the three research questions established in our study.
6   Firstly, research question 1 analyses consumers' emotions associated with the decision-making
7   process for the adoption of use-oriented PSS. Then, research question 2, adopts a different
8   standpoint, and it aims to identify whether the pandemic has changed consumers' emotions
9   towards use-oriented PSS. Finally, research question 3 addresses the impact of COVID-19 on
10   consumers' emotions towards use-oriented PSS.
11
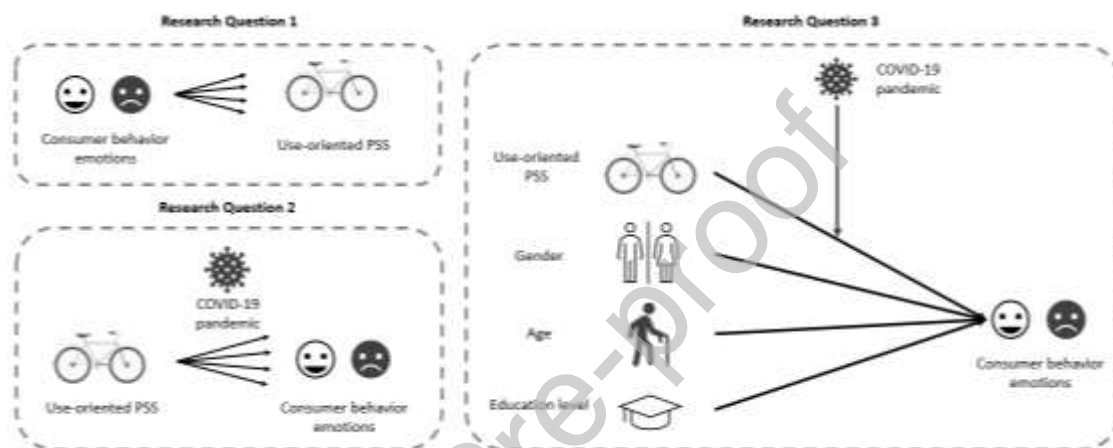
12
13   **Figure 2** – Graphical representation of the research questions

14

15   **3. Method**

16   To reach our objective, we used descriptive research of a multiple transversal
17   approach. In this approach, two or more samples of interviewees are surveyed, and each
18   sample is collected only once (Malhotra, 2009). Our data derive from two distinct sample
19   collections: one prior to the existence of COVID-19 and one amid the COVID-19 pandemic.

20

21   *3.1 Data collection and Measures*

22   The data collection instrument used in this research was a structured questionnaire
23   (Appendix A). Our questionnaire's objective was to verify how consumers positioned
24   themselves with respect to emotions and feelings when evaluating the adoption of use-
25   oriented PSS (prior to and amid the COVID-19 pandemic). It must be noted that we offered
26   examples of use-oriented PSS in the introduction section of the instrument. We consider this
27   initial presentation relevant since the presentation of the study object to the respondents
28   allows for a greater veracity of the researched facts (Malhotra, 2009).

1   After the reverse translation of the CES Scale, the researchers conducted a linguistic
2   analysis [5] of the expressions in the scale for the Brazilian context. This decision was made since
3   social and cultural aspects can interfere in the comprehension of the emotion terms of the
4   scale used (Chentsova-dutton and Iyons, 2016). As a result, some factors were substituted by
5   descriptors. Due to the instrument design strategy, which encompassed bipolarity of emotions
6   (further explained in the next paragraph), some antonyms were added to the original scale.
7   Additionally, based on studies that found the interference of guilt and pride in pro-
8   environmental behavior (Pscicelli et al., 2015; Castro-González et al., 2019; Liang et al., 2019),
9   the authors included these emotions as factors in the data collection instrument (in the CES
10   these emotions are descriptors of the "Other items'' factor).

11   Regarding the measurement mechanism used in the design of the instrument, we
12   decided to use the Semantic Differential (Malhotra, 2009). This mechanism's choice is justified
13   in its possibility of measuring affects and/or emotions arising from distinct phenomena using
14   oppositions, that is, the use of antonymic adjectives in each end (Llinares and Page, 2007).
15   Between the ends, each interval represents a determined magnitude expressed by either
16   implicit or explicitly quantifiers (Malhotra, 2009). The intervals receive a numeric value, which
17   could be -3, -2, -1, 0, +1, +2, +3. This scale was used to analyse emotions and use-oriented PSS
18   (Section 4.1), and they were linearly transformed into a scale of 1, 2, 3, 4, 5, 6, 7 to facilitate
19   the interpretation of MANOVA and the regression coefficients in sections 4.2 and 4.3 (Hsu et
20   al., 2000). Finally, before proceeding to the data collection procedures, the questionnaire was
21   validated by three specialists (one psychology scholar with a Ph.D. degree and extensive
22   research on psychology and the relationship between emotions and sustainability and the
23   environment, one engineering scholar with a Ph.D. in Industrial Engineering and experience in
24   statistical experimentation, and one practitioner from the marketing field with wide
25   experience in consumer behaviour research). In addition to the CES scale, we also inquired
26   respondents about their prior use of PSS offers, gender, age group, and education level. Table
27   1 summarizes the characteristics of the variables collected and their scales.

28

29   **Table 1** - Characteristics of the variables collected and their scales

Type	Variable Name	Measures
Independent Variables	COVID-19*	Dummy-coded variable
		Pre-COVID-19 = -1
		Amid-COVID-19 = 1
	PSS use	Dummy-coded variable
		No = -1
		Yes = 1
	Gender	Dummy-coded variable
		Female = -1
		Male = 1
	Age	Between 18 and 24 years old = -1
		Between 24 and 35 years old = 0
		Older than 35 years = 1
	Education level	High school = -1
		Bachelor's degree (full or incomplete) = 0
		Graduate course (full or incomplete) = 1

---

[5] The linguistic analysis of the factors and descriptors resulting from the reverse translation observed, fundamentally, (i) the neurolinguistics (language and mind) and (ii) the sociolinguistics (language and society) (Chomsky, 1975).

Dependent Variables	Peacefulness; Contentment; Unconcern; Joy; Trust; Pride; Sympathy; Welcomed; Love; Optimism; Enthusiasm; Positive Surprise; Passion; Relief; Serenity.	**CES scale**: 7-point Likert scale

1   * Pre-COVID-19 refers to the first questionnaire collected in November 2019. Amid-COVID-19 refers to
2   the questionnaire collected in May 2020.

3

4   Regarding its classification, the sampling is non-probabilistic by convenience. Non-
5   probabilistic sampling may be chosen when time, financial, material, and human constraints
6   make probabilistic sampling unfeasible (Kumar et al., 2002). However, we stress that even
7   though non-probabilistic studies have restrictions regarding the generalizations resulting from
8   their findings, when properly conducted, they can produce satisfactory results that are faster
9   and less expensive (Curwin and Slater, 2008). Nevertheless, convenience sampling is the
10   prevailing non-probabilistic sampling method, and it addresses the approach where subjects
11   (respondents) at hand are recruited at events or locations based on researchers' convenience
12   of questionnaire collection (Wolf et al., 2016).

13   Since our research addresses PSS consumption, researchers approached consumers
14   near bike-sharing spots, ride-sharing apps drop-off locations (to collect data with possible PSS
15   consumers), shopping malls, and university student centres (to collect both possible PSS
16   consumers and non-consumers). Additionally, we collected data using an online form as a
17   secondary data collection mechanism in the pre-COVID-19 phase and as the exclusive data
18   collection source in the amid-COVID-19 phase.

19   Data was collected in Brazil, a developing country where PSS consumption has recently
20   started to gain momentum (Salman and Fujita, 2018). The first data collection phase was
21   conducted in November 2019, as a part of an ongoing project that addressed PSS
22   consumption, before the COVID-19 pandemic. The first cases of COVID-19 were reported in
23   China in December 2019 (WHO, 2020). For this initial session, 100 responses were collected
24   using both digital and in-person data collection procedures.

25   The second session was collected during May 2020. At the beginning of the second
26   session's data collection, COVID-19 had around 91,000 accumulated confirmed cases and
27   approximately 6,000 deaths in Brazil. As data collection continued, a spike of cases was
28   witnessed, and when we finished the collection, Brazil had already more than 510,000
29   accumulated cases (with more than 29,000 deaths caused by COVID-19) (DATASUS, 2020). Due
30   to the transmission characteristics of the virus, the second session was fully conducted digitally
31   using Google Forms. In this session, 92 valid responses were collected (after the exclusion of
32   one invalid response). As the same instrument was used in both phases (only headlines and
33   initial explanations were different), both datasets were merged into one by aggregating the
34   100 pre-COVID-19 questionnaire responses and the 92 amid-COVID-19 responses.

35   To ensure that sample size adequately suits the data analysis procedures adopted
36   (namely multivariate analysis of variance and multiple regression), we followed Hair et al.,
37   (2018) recommendations for MANOVA research design. Based on this, we ensured that sample
38   size (n = 192) was greater than the number of dependent variables (15 CES emotions). The
39   minimum threshold of 20 observations per group (pre-COVID and amid-COVID) was exceeded,
40   as there are 100 observations in the pre-COVID group, and 92 in the amid-COVID group. Lastly,
41   we also sought a balanced sample size distribution in both COVID groups. Similar sample sizes

1 for MANOVA analysis in consumer behavior studies have been adopted by Kim and Park
2 (2020), O'Connor et al. (2017), and Minton and Rose (1997). It must also be noted that
3 MANOVA and regression analysis are not sensitive to reduced sample sizes, and therefore,
4 they provide robust results with a sample size similar to the one adopted in our research.

5 We operationalized the COVID-19 variable by creating a new column in the dataset
6 entitled "COVID-19". The column assumed the value [-1] if the respondent was surveyed in
7 November 2019, and [1] if the respondent was surveyed amid the COVID-19 pandemic (in May
8 2020). To assure that consumers were aware of our objective of measuring the impact of the
9 COVID-19 pandemic on consumer behaviour, we explicitly stated in the instructions of the
10 second data collection questionnaire our intentions of understanding the impact of the COVID-
11 19 pandemic on consumers' emotions towards PSS consumption. Although we provided
12 examples of PSS to prime this type of offer consumption on consumers' responses, we did not
13 explicitly relate COVID-19 health-related and transmission aspects to PSS consumption, to
14 avoid respondent manipulation. This allowed us to effectively evoke and capture consumers'
15 self-expressed PSS consumption-related emotions without establishing pre-defined cause-
16 effect relationships. Hence, in total, the final sample is composed of 192 valid responses. For a
17 descriptive summary of the statistics, see Appendix B.

18

19 *3.2 Dimension reduction for regression*

20 The adapted version of CES used in this paper is composed of 15 emotions that tend to
21 be highly correlated. Reducing the dimensionality of response variables is indicated to allow
22 for more manageable constructs that enable improved interpretation of the results in
23 regression analysis (Vigneau and Qannari, 2003). According to Vigneau and Qannari (2003),
24 clustering of variables is an effective means of organizing multivariate data into meaningful
25 structures. Following this approach, for the regression analyses, we reduced the
26 dimensionality of the scale through a k-means clustering technique to CES variables using the
27 squared Euclidean distance as a distance metric to group variables. The best configuration was
28 that composed of three clusters (henceforth named constructs), the first containing 3
29 variables, the second one containing 5 variables, and the third containing 7 variables. An
30 analysis of the correlation matrix confirmed three majorly correlated groups of variables.

31 The constructs reflect the underlying latent concept of the variables that form it. The
32 first construct (Peace and Serenity) is composed of the variables Peacefulness, Serenity and
33 Welcomed. The second construct (Trust and Relief) contains five variables: Trust performance,
34 Sympathize with adopters, Unconcern, Contentment, and Relief. While the third construct
35 (Optimism and Enthusiasm) is formed by Positive surprise, Optimism, Enthusiasm, Passion,
36 Love to find PSS offers, Joy to use products I want, and Pride. We also validated the CES scale
37 and the three constructs using Cronbach's alpha and Confirmatory Factor Analysis (see section
38 3.4). After the constructs were validated, we created a new variable for each construct
39 represented by the average of the variables that compose that given construct for each
40 observation.

41

42 *3.3 Data analysis*

1   Data analysis followed a sequence of procedures to test the hypotheses proposed in
2   Section 2. First, we used a multivariate analysis of variance (MANOVA) to test for H1 as to
3   whether consumers' emotions changed from the pre-COVID-19 phase to the amid-COVID-19
4   phase. MANOVA allowed verifying if there is a significant difference in emotions' means
5   considering the pre and amid pandemic phases. MANOVA uses the covariance between
6   dependent variables to test the significance of mean difference in response variables for
7   different factors of a categorical independent variable (Hair et al., 2018). In our model, the
8   CES's 15 emotions were used as dependent variables, and COVID-19 phase (pre and amid) was
9   used as the independent variable. To account for the variability of the other effects and
10   remove them from the error term, we also included the following main effects in the MANOVA
11   model, together with their interaction with COVID-19 phase: PSS use, gender, age, and
12   education level.

13   We also used ordinary least squares (OLS) multiple regression models where the
14   constructs from the k-means clustering technique were used as dependent variables and the
15   COVID-19 phase, PSS use, gender, age, education level as independent variables. We also
16   included moderation terms for gender, PSS use, age, education level as 2-level interactions
17   with COVID-19 phase to test H2-H5. These regression models were conducted to elucidate the
18   effect size of COVID-19 phase on emotions. The OLS regression models provide estimates of
19   the effect of independent variables on dependent variables. OLS regression estimates the
20   predicted change in the dependent variable (in our equations, the emotion constructs) given
21   the changes in the independent variables (PSS use, Gender, Age, Education level, and their
22   moderation effects with the variable COVID-19 phase) (Hair et al., 2018; Wooldridge, 2018).
23   Therefore, OLS regression models are models of additive characteristics that allow estimating
24   the cumulative impact of the independent variables on the dependent variables, which is in
25   line with our third research question. Nevertheless, such a statistical algorithm requires testing
26   assumptions of multicollinearity among independent variables, multicollinearity, normality,
27   linearity, and homoscedasticity (Hair et al., 2018). Figure 3 shows the regression model
28   analysed and the constructs considered to respond to research question 3 (H1 is related to
29   research question 2 and we used MANOVA to test it).

30
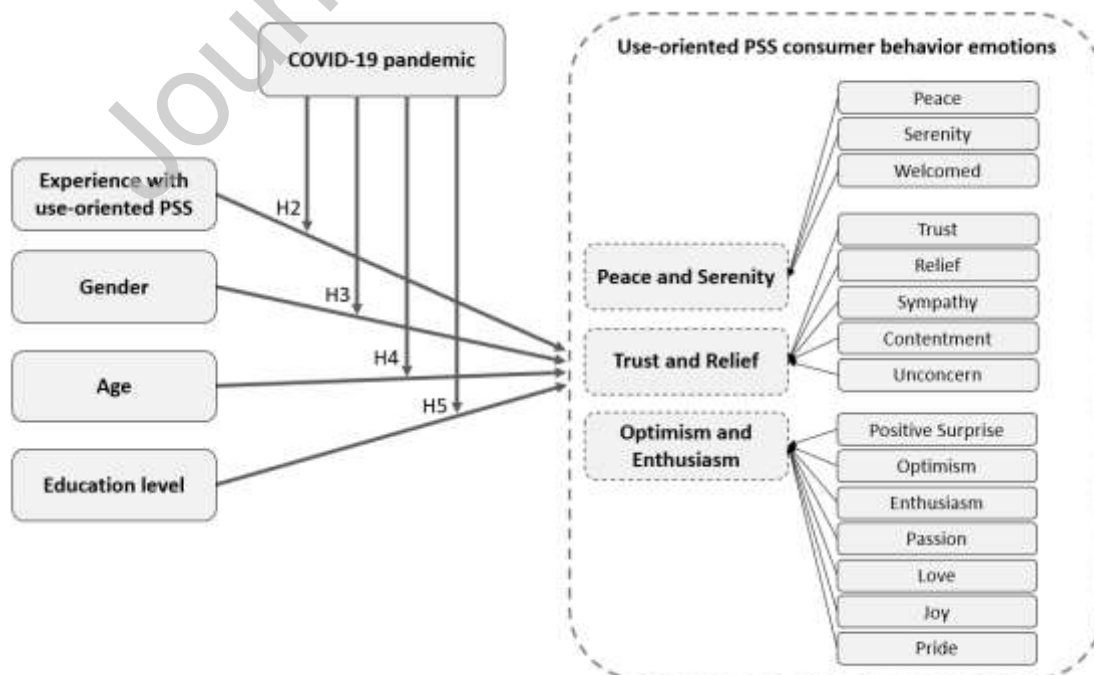
1   **Figure 3** – Regression model and the constructs analysed

2

3   *3.4 Reliability and Validity*

4   As an established scale, CES has been used and validated in several studies and it can
5   be considered a reliable scale to reflect consumers' emotions (Laros and Steenkamp, 2005).
6   We tested for the CES scale's convergent validity using Cronbach's alpha and Confirmatory
7   Factor Analysis (CFA). The full scale presented satisfactory alpha results of 0.925. The
8   constructs derived from the k-means clustering procedures also presented satisfactory alpha
9   results, except for [Peace & Serenity], which is slightly below the test's 0.7 threshold.
10   Nonetheless, as CES is widely used and its validity has been previously established, and given
11   the mathematical nature of k-means clustering, a below threshold alpha for one construct was
12   accepted.

13   As for the CFA tests, we tested for convergent validity through composite reliability
14   (should be >0.7) and goodness of fit through Standardized Root Mean Square Residual (SRMR)
15   (<0.08) and Normed χ^2 (χ^2/df) (<5) (Hair et al., 2018). Composite reliability met the minimum
16   threshold for Trust & Relief (0.838) and Optimism & Enthusiasm (0.864), and a satisfactory
17   result for Peace & Serenity (0.655). Regarding goodness of fit, our model obtained a Normed χ^2
18   of 3.55 (χ^2=309.256, df=87) and SRMR of 0.06, presenting satisfactory fit indices (Hair et al.,
19   2018; Hooper et al., 2008). Also, confirming the model's adequate fit, all construct factor
20   loadings were significant (Hair et al., 2018). It is worth noting that Cronbach's alpha for the
21   Peace & Serenity construct is 0.659 (below the recommended threshold of > 0.7). Besides, one
22   item of this construct (Serenity) presents a factor loading of 0.562 (below the recommended
23   thresholds of > 0.6). This means that Peace & Serenity is not as strong a construct as the other
24   two. Nevertheless, we decided to keep this construct and this factor in the model because they
25   are just slightly below the recommended thresholds and the loadings of the three factor items
26   in the construct are significant at the 0.05 level adopted, rendering them acceptable. Table 2
27   presents the constructs, and the CFA validity tests. In Appendix B, we present Cronbach's alpha
28   results and additional constructs' statistics of CFA.

29   **Table 2** - Constructs and validity tests

Construct	Variables	Loadings	Composite Reliability	Cronbach's alpha
Peace & Serenity	Peacefulness	0.700***	0.655	0.659
	Serenity	0.562***		
	Welcomed	0.604***		
Trust & Relief	Trust	0.717***	0.838	0.835
	Sympathy	0.743***		
	Unconcern	0.723***		
	Contentment	0.731***		
	Relief	0.648***		
Optimism & Enthusiasm	Positive surprise	0.646***	0.864	0.857
	Optimism	0.711***		
	Enthusiasm	0.727***		
	Passion	0.613***		
	Love	0.748***		
	Joy	0.736***		
	Pride	0.643***		

30

1 **4. Results**

2   This section has three subsections, in line with established research problems:
3 emotions and use-oriented PSS (4.1); consumer emotions and effect of COVID-19 (4.2); and
4 impact of the COVID-19 on consumers' emotions towards use-oriented PSS (4.3).

5

6 *4.1 Emotions and Use-Oriented PSS Adoption*

7   According to the data presented in table 3, most consumers preferred to position
8 themselves closer to positive emotions rather than negative ones. This means that a great
9 share of the sample understands that the adoption of use-oriented PSS does not cause stress
10 or displeasure, common feelings associated with negative emotions (Watson et al., 1988;
11 Watson and Spence, 2007). On the contrary, the decision-making process that we investigate
12 can enable positive feelings like attraction, enthusiasm, and willingness to act (Bagozzi et al.,
13 1999).

14

15 **Table 3 -** Consumer's emotional positioning toward use-oriented PSS

Negative	-3	-2	-1	0	1	2	3	Positive		
A	1	2	3	4	5	6	7	B	Mean*	SD*
I feel angry in the use-oriented PSS adoption	0	0	0	14	25	31	30	I feel peacefulness in the use-oriented PSS adoption	5.766	1.033
Use-oriented PSS make me feel discontent	0	0	10	16	17	26	31	Use-oriented PSS make me feel contentment	5.976	1.107
I feel worried when I use PSS	1	4	7	19	17	28	24	I feel unconcerned when I use PSS	5.755	1.021
I feel sad when I have to use PSS for products that I desire	0	0	0	14	26	32	28	I feel joy to know that I can use products that I want through PSS	5.736	0.933
I feel fear when I am using PSS	1	7	15	8	23	33	13	I trust in the performance of PSS	5.853	0.913
I can feel ashamed when I don´t know how to use PSS	5	12	14	6	14	20	29	I feel pride when I use PSS	6.102	0.924
I envy who adopted to use PSS	0	0	0	8	11	34	47	I sympathize with people who adopted to use PSS	6.308	0.932
I feel lonely when I look for use-oriented PSS	1	16	21	17	18	16	11	I feel welcomed when I search for use-oriented PSS	5.732	1.075
I hate to adopt use-oriented PSS	0	0	0	17	43	18	22	I love to find use-oriented PSS in the places	5.513	1.018
I am pessimist about the use-oriented PSS	0	3	3	8	30	33	23	I am optimist about the use-oriented PSS	5.804	0.921
I feel disappointed in the use of PSS	0	1	0	20	30	33	16	I feel enthusiasm in the use of PSS	5.490	0.989
I feel frustrated when I do not find use-oriented PSS	4	16	15	8	24	17	16	I am positively surprised when I find use-oriented PSS	5.785	0.949
I have contempt for use-oriented PSS	0	0	0	39	35	21	5	I have passion for use oriented PSS	4.879	0.895
I feel guilty when I do not use PSS	8	12	15	3	20	23	19	I feel relieved when I use PSS	5.908	0.864
The process of choosing and using PSS makes	0	0	0	43	23	17	17	The process of choosing and using PSS brings me	5.057	1.134

me feel eager								serenity		

1 *Mean and standard deviation (SD) are reported based on the 1-7 scale (linearly transformed from the -3 to 3 scale
2 for clarity purposes)
3 Note: n = 100 (only pre-COVID-19 responses are reported)

4

5   Table 3 shows that the positive emotions most triggered concerning use-oriented PSS
6 adoption were sympathy (92%), joy (86%), peacefulness (86%), optimism (86%), and love
7 (83%). The percentage of positive emotion triggering is calculated by summing the occurrence
8 of the three positive points of the scale (5, 6, and 7 in the 1 to 7 scale) and dividing it by the
9 number of respondents (n = 100). This result shows that both conscious and basic emotions
10 are present in the process of adopting use-oriented PSS. However, love, peacefulness, and joy
11 also had citations at the neutral point of the scale (17%, 14%, and 14%, respectively).
12 Regarding negative emotions, we highlight loneliness (38%), guilt (35%), frustration (35%),
13 shame (31%), and fear (23%). The percentage of negative emotion triggering is calculated by
14 summing the occurrence of the three negative points of the scale (1, 2, and 3 in the 1 to 7
15 scale) and dividing it by the number of respondents (n = 100). This analysis provides an
16 overview of how consumers relate to the PSS consumption emotions and whether they are
17 more inclined to feeling positive or negative emotions.

18

19 *4.2 Consumer Emotions and Effect of COVID-19*

20   To test *H1,* first, we conducted a MANOVA to identify whether COVID-19 pandemic
21 changed how consumers relate to PSS consumption based on their emotions. Hence, COVID-19
22 phase was used as the independent variable, and CES variables were used as dependent
23 variables. MANOVA results presented in Table 4 show significance for COVID-19 phase (p<0.01
24 using either Pillai's trace, Wilk's lambda, Hotelling's trace, or Roy's largest root). These results
25 show that emotions' average changed from the pre-COVID-19 phase to the amid-COVID-19
26 change and supports *H1*. We also found a significant difference for the PSS use (versus no use)
27 groups (p<0.05) and age groups (p<0.1). The interaction between COVID-19 phase and Age was
28 also significant (p<0.01), which provides initial evidence to support *H2*. Table 4 presents the
29 results of the MANOVA model.

30

31   **Table 4** - MANOVA model

		Pillai's Trace	Wilks' Lambda	Hotelling's Trace	Roy's Largest Root
COVID-19 phase	Test Statistic	0.348	0.652	0.533	0.533
	F-value	**5.835***	**5.835***	**5.835***	-
PSS use	Test Statistic	0.143	0.856	0.167	0.167
	F-value	**1.827**	**1.827**	**1.827**	-
Gender	Test Statistic	0.074	0.925	0.080	0.080
	F-value	0.884	0.884	0.884	-
Age	Test Statistic	0.227	0.785	0.257	0.149
	F-value	1.413*	1.406*	1.399*	-
Education level	Test Statistic	0.164	0.841	0.181	0.124

	F-value	0.985	0.984	0.984	-
COVID-19 phase x PSS use	Test Statistic	0.081	0.918	0.088	0.088
	F-value	0.969	0.969	0.969	-
COVID-19 phase x Gender	Test Statistic	0.107	0.892	0.119	0.119
	F-value	1.311	1.311	1.311	-
COVID-19 phase x Age	Test Statistic	0.292	0.727	0.349	0.239
	F-value	**1.881*****	**1.889*****	**1.896*****	-
COVID-19 phase x Education level	Test Statistic	0.180	0.825	0.203	0.152
	F-value	1.094	1.100	1.106	-

1   *n = 192 *p<0.1; **p<0.05; ***p<0.01*

2

3   After the MANOVA confirmed that emotions changed from the pre-COVID-19 to the
4   amid-COVID-19 phases, we proceeded to analyse the means for each phase through several
5   individual Analysis of Variance (ANOVA) tests. Therefore, each of the 15 emotions from the
6   CES was used individually as dependent variable and the COVID-19, PSS use, gender, age,
7   education level, and their two-level interactions with COVID-19 phase were included in the
8   model. We found that peacefulness, contentment, unconcern, joy, trust, pride, sympathy with
9   consumers, positive surprise, and serenity had a significant mean change from the pre-COVID-
10 19 phase to the amid-COVID-19 phase (p<0.05). The average for such emotions was greater in
11 the pre-COVID-19 phase, which provides evidence of the pandemic's negative effect on
12 consumers' emotions. Welcome, love, optimism, enthusiasm, passion, and serenity did not
13 differ significantly from the pre-COVID-19 phase to the amid-COVID-19 phase. It is worth
14 noting that the averages were always lower in the pandemic period (compared to the pre-
15 COVID-19 phase), but for this last set of variables, the difference did not reach the threshold of
16 p<0.05. Table 5 presents the emotions' average in the pre- and amid-COVID-19 phases and the
17 F-value of the ANOVAs.

18

19   **Table 5** - Emotions' averages for the pre- and amid-COVID-19 phases

CES emotion	Fitted average Pre-COVID-19	Fitted average Amid-COVID-19	F-value
Peacefulness	5.766	5.273	**4.88****
Contentment	5.976	5.217	**11.06*****
Unconcern	5.755	4.492	**21.32*****
Joy	5.736	5.247	**3.96****
Trust	5.853	4.913	**17.41*****
Pride	6.102	4.870	**30.07*****
Sympathy	6.308	5.422	**19.25*****
Welcomed	5.732	5.314	3.68*
Love	5.513	5.171	2.91*
Optimism	5.804	5.430	3.75*
Enthusiasm	5.490	5.186	2.46
Positive Surprise	5.785	4.723	**21.91*****
Passion	4.879	4.825	0.09

Relief	5.908	4.664	**37.92***
Serenity	5.057	4.863	0.38

1 **Note**: Pre-COVID-19 *n* = 100; Amid-COVID-19 *n* = 92. **p<0.1; **p<0.05; ***p<0.01*

2

3 *4.3 The impact of the COVID-19 on consumers' emotions towards use-oriented PSS*

4   We also examined the effect of COVID-19 phase on emotions by building OLS
5 regression models. We used the emotion constructs created through the k-means clustering as
6 dependent variables and the main effects of COVID-19 phase, PSS use, gender, age, and
7 education level as independent variables. To further understand the impact of COVID-19 phase
8 on consumers (H1), we analysed the main effect of COVID-19 phase on emotions. Besides, to
9 examine H2, we analysed the moderation effect of PSS use on the relationship between
10 COVID-19 phase and the emotions constructs. For H3, we analysed the moderation of gender
11 on the relationship between COVID-19 phase and emotions; the moderation of age on the
12 relationship between COVID-19 phase and the emotions was analysed for H4; and, the
13 moderating effect of education level on the relationship between COVID-19 phase and
14 emotions was used to analyse H5. The significant interaction is to be interpreted as the
15 dependence of COVID-19 phase's effect on the magnitude of another explanatory
16 (moderating) variable when impacting the response variables (emotions' constructs)
17 (Wooldridge, 2016).

18   To test the hypotheses, COVID-19 phase, PSS use, gender, age, and education level,
19 together with their interaction terms with COVID-19 phase were set as independent variables.
20 In Model 1, the construct Peace and Serenity was regressed on the independent variables. In
21 Model 2, Trust and Relief were used as the dependent construct and, in Model 3, Optimism
22 and Enthusiasm worked as the dependent construct. Considering OLS regression assumptions,
23 we tested for normality (through skewness and kurtosis), linearity, multicollinearity, and
24 homoscedasticity by analysing fitted versus residual values as recommended in Hair et al.
25 (2018). Skewness and kurtosis analysis for the continuous variables did not exceed the
26 threshold limits (-2 to +2), which indicates that the normality assumption was met (George and
27 Mallery, 2010) (see Appendix B).

28   Additionally, we used a Q-Q plot for visual analysis of normal probability, and the
29 results show that the normality assumption was not violated. Multicollinearity was tested
30 based on the variance inflation factor (VIF), which measures independent variables' collinearity
31 using multiple regressions (Hair et al., 2018). The VIF of independent variables ranged from
32 1.05 to 1.39, below the threshold of 10 (Hair et al., 2018). Hence, the multicollinearity
33 assumption was not violated. We also tested normality using histograms of the continuous
34 variables from the CES, and by plotting the histogram of the response variables' residuals for
35 visual inspection of normal distribution. Linearity was visually tested using scatter plots. Both
36 assumptions were not violated by our model.

37   Therefore, we proceeded to apply the OLS regression algorithm for the three models.
38 Our results show that **Model 1** (Peace and Serenity) was significant (p<0.01, Adjusted R^2 =
39 0.211), as well as **Model 2** (Trust and Relief) (p<0.01, Adjusted R^2 = 0.302), and **Model 3**
40 (Optimism and Enthusiasm) (p<0.01, Adjusted R^2 = 0.128). The findings show that the effect of
41 COVID-19 phase was significant (p<0.05) only for **Models 2 and 3**. In these models, a change
42 from the pre- to the amid-COVID-19 phase decreased consumers' trust and relief and their
43 optimism and enthusiasm (Model 2: β = -0.484, p<0.01; Model 3: β = -0.193, p<0.01). We also

1 found that as a main effect PSS use has a negative significant impact on Peace and Serenity (β
2 = -0.215, p<0.01), nonetheless, this effect is not related to the COVID-19 pandemic and might
3 be associated with PSS offers' complexity that causes cognitive overload during decision
4 making. The main effect of age was also found to significantly impact Peace and Serenity (β =
5 0.265, p<0.01) and Trust and Relief (β = 0.254, p<0.01). Table 6 summarizes the results of the
6 three regression models.

7

8 **Table 6** - Regression Models

	Model 1 Peace and Serenity	Model 2 Trust and Relief	Model 3 Optimism and Enthusiasm
Constant	**5.322***	**5.46***	**4.686***
COVID-19 phase	-0.132*	**-0.484***	**-0.193***
PSS use	**-0.215***	-0.055	-0.006
Gender	-0.121*	-0.020	-0.056
Age	**0.265***	**0.254***	0.096
Education level	0.025	-0.037	0.058
COVID-19 phase x PSS use	-0.069	-0.049	0.048
COVID-19 phase x Gender	0.031	0.040	0.088*
COVID-19 phase x Age	**0.438***	**0.231**	**0.181**
COVID-19 phase x Education level	-0.216*	-0.045	-0.134
F-value	**6.71***	**10.20***	**4.13***
R^2	0.249	0.335	0.169
Adjusted R^2	0.211	0.302	0.128

9 **Note**: Standardized coefficients are reported. *p<0.1; **p<0.05; ***p<0.01*

10

11 Findings do not show a significant relationship between the interaction of COVID-19
12 phase and PSS use on any of the three models. Thus, H2 is not supported by our results.
13 Similarly, the results for the impact of the interactions between COVID-19 phase and gender,
14 and COVID-19 phase and education level on the three constructs were also not significant.
15 Therefore, our results do not provide evidence to support either H3 or H5 (see table 7).
16 Nonetheless, the moderation of age on the impact of COVID-19 phase on emotions was
17 significant for the three models (p<0.05). This result fully supports H4 that the effect of COVID-
18 19 on consumers' emotions depends on consumers' age group. Based on that, we analysed the
19 averages of emotions for the different age groups in the pre and amid-COVID-19 phases. For all
20 age groups, the average in the amid-COVID phase was lower than during the pre-COVID-19
21 phase. Nonetheless, this effect is mostly concentrated in the "between 18 and 24 years old"
22 group, where the difference from the pre to the amid-COVID-19 phases was greater when
23 compared to the other groups. Figure 4 shows the moderating effect of age on the COVID-19
24 phase's impact on emotion constructs for peace and serenity (A), trust and relief (B), and
25 optimism and enthusiasm (C).

26
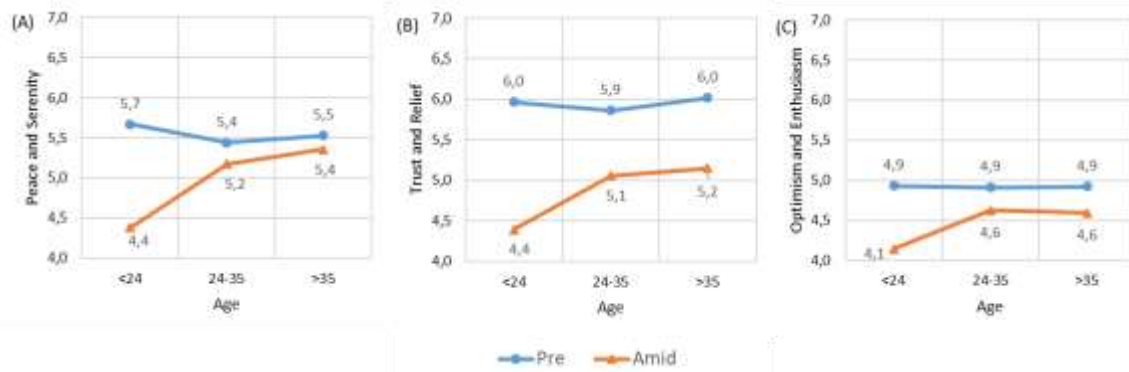
Figure 4 - Moderation effect of age on the impact of COVID-19 on emotions

Table 7 - Hypotheses and results

Hypotheses	Outcome	Results
H1 – Consumers' emotions towards use-oriented PSS have changed due to the COVID-19 pandemic	**Supported**	Consumers' emotions differed from the pre to the amid-COVID-19 phases. The averages of emotions related to Trust and Relief and Optimism and Enthusiasm decreased after the start of the pandemic
H2 – The effect of previous consumption of (experience with) use-oriented PSS offers on consumers' emotions is moderated by COVID-19	Not supported	The impact of the pandemic on emotions was roughly the same on PSS users and non-users
H3 – The COVID-19 pandemic moderates the impact of gender on consumers' emotions	Not supported	The impact of the pandemic on emotions was roughly the same for both genders
H4 - The COVID-19 pandemic moderates the relationship between consumers' age and their emotions. Therefore, young consumers' emotions are expected to be more affected by the pandemic than other age groups	**Supported**	The impact of the pandemic, degrading the set of emotions, was greater in younger people
H5 - The relationship of educational level on consumers' emotions is moderated by the COVID-19 pandemic	Not supported	The impact of the pandemic on emotions was roughly the same for the different education levels

5. Discussion

Through an adaptation of Richin's (1997) CES Scale, our findings show that in the decision process for use-oriented PSS adoption, consumers are closer to positive emotions rather than negative ones. Another important result is the identification that basic emotions, like joy and love, were frequent in the pre-COVID-19 data collection. Besides, we also note that some individuals expressed negative emotions such as loneliness, guilt, frustration, shame, and fear. Analysing these results in comparison to previous studies, we understand that joy is more related to pro-environmental engagement (as found by Kolling et al., 2020) than to narcissism (as found by Hwang and Kim, 2016). We also infer that the same happened with love. Respondents related love to the feeling they experience for knowing that use-oriented PSS are available, and not with "possessive love", as mapped in other studies (Dong et al., 2018). We emphasize that, if love is related to the feeling of possession and ownership, it can inhibit use-

1 oriented PSS due to this offer's characteristics, as consumers do not have ownership of the
2 product (Mont 2002 and 2004; Tukker, 2015; Annarelli et al., 2016; Schmidt et al., 2016; Yin et
3 al., 2018, among others).

4   Still comparing the results obtained in the pre-COVID 2019 data collection with other
5 studies (focused on green product purchasing or PSS adoption), the negative emotion guilt can
6 be understood as a driver for PSS adoption (Peloza et al., 2013; Onwezen et al., 2013 and 2014;
7 Theotokis and Manganari, 2015; Piscicelli et al.,2015, among others). As for the feelings of
8 loneliness and frustration, their experience is related to utilitarian attributes. As loneliness and
9 frustration may be associated with the difficulty of making available and maintaining this type
10 of provision in the neighbourhood, city, and region in which respondents reside. Previous
11 research has indicated that insecurity (Schorr, 2014; Catulli et al., 2017) and disbelief
12 (Kristensen and Remmen, 2019) inhibit the PSS adoption process. Complementarily, previous
13 research has indicated that access and maintenance can be significant barriers to PSS adoption
14 (Mont, 2002 and 2004; Mont and Tukkar, 2006; Piscicelli et al., 2015; Schulte and Voß, 2015;
15 Annarelli et al., 2016). Finally, we infer that shame and fear, as in the study by Schmidt et al.
16 (2016), were related to not knowing how to use PSS.

17   Regarding the effect of pandemic on emotions related to the adoption of use-oriented
18 PSS, we found that COVID-19 has negatively impacted emotions from the CES scale. In other
19 words, the COVID-19 pandemic has a negative effect on consumers' emotions and feelings in
20 the process of adopting use-oriented PSS. In the data collection carried out during the
21 pandemic, consumers moved from the positive side to the more negative one. This can be
22 noted based on the decrease of the emotions' averages presented in Table 5. Specifically
23 comparing the emotions with the highest frequencies in pre-COVID-19 data collection,
24 sympathy, joy, and peacefulness suffered a significant average descent effect due to the
25 pandemic. Also, negative emotions such as fear, shame, and guilt, which were already present
26 in the pre-COVID-19 phase (that is, some respondents had denoted those negative emotions),
27 had an increase in manifestations in amid-COVID-19. This fact indicates that the pandemic
28 significantly reduced individuals' approximation to emotions of trust, pride, and relief
29 (respectively).

30   Theoretically, positive emotions reflect the extent to which a person feels enthusiastic,
31 active, and alert (Watson et al., 1988). Whereas negative emotions are subjective dimensions
32 caused by stress and displeasure that end up subjecting a person to a series of aversion
33 variables (Duhachek, 2005). Positive and negative emotions are directly related to the
34 perception of risks (Kahn and Isen, 1993; Luce, 1998). In this case, it is worth mentioning Tull et
35 al. (2020), whose research indicates that, due to the instability and uncertainties generated by
36 the pandemic, the incidence of negative emotions in people, such as fear and eagerness, was
37 increased. Therefore, we can infer that the emotions and feelings provoked by the pandemic
38 tend to interfere in the feelings and emotions of consumption related to the adoption of use-
39 oriented PSS.

40   Additionally, Loxton et al. (2020) identified that consumer behaviour during the
41 COVID-19 crisis is in line with behaviour exhibited previously during historical shock events. In
42 this sense, in addition to consumers tending to panic buying, herd mentality, and prioritizing
43 purchases focused on basic needs, consumer emotions were broadly and negatively influenced
44 by media coverage of COVID-19. In the same vein, a study by Kilgo et al. (2019) clarifies that
45 the media tends to contribute disproportionately to the panic caused by crises, increasing
46 people's anxiety and fear. As verified by Pieri (2019) when analysing how people responded to

1 H1N1 and the Ebola outbreak of 2014-2015, extensive media coverage promotes insecurity
2 and collective hysteria, compromising consumers' behaviour towards different products.

3 Evaluating the three constructs of emotion, the negative impact of COVID-19 is
4 significant on "Trust and Relief" and "Optimism and Enthusiasm". When evaluating the
5 emotions that constitute the two groups, we found that sympathy (model 2) and love (model
6 3) are important antecedents of altruism (Midlarsky, 1968; Midlarsky and Suda, 1978).
7 Unconcern, contentment, and relief (model 2), joy and pride (model 3), can trigger social
8 concern (Naess and Haukeland, 2008). Studies carried out before the pandemic had signalled
9 that altruism and social awareness tended to drive the adoption of use-oriented PSS
10 (Armstrong et al. 2016; Catulli et al., 2017; Akbar and Hoffmann, 2018; Mashhadi et al., 2019).
11 As traumatic events tend to increase "self-interest" in individuals (Mansbridge, 1990), we
12 found an important change in consumer emotions related to the PSS adoption process. As
13 stated by Cohen (2020), the social detachment practiced, aiming to reduce the risk of
14 transmission, tends to reinforce individualized commitments to the detriment of public
15 commitments and, consequently, shared consumption modes, a fact that meets our results.

16 As for the Peace and Serenity model, the COVID-19 pandemic did not have a
17 statistically significant impact. In this case, comparing the pre-COVID-19 phase with the amid-
18 COVID-19 phase, we noticed that the averages for two of the emotions that make up the group
19 (welcoming and serenity) already had low frequencies when compared to the others, mainly
20 for serenity, which had a 43% frequency at the point of indifference of the scale (pre-COVID 19
21 phase). As previously mentioned, when we highlight the negative emotions that presented
22 frequencies in the pre-COVID 19, these results are related to the connection of these feelings
23 with utilitarian attributes, such as performance and availability. The eagerness in consumption
24 (opposite emotion of serenity on the scale) indicates the uncertainty of success, imaginary
25 obstacles, idealization of the pleasure to be experienced, and the amount of time necessary to
26 reach the goal (Lazarus, 1991; Macinnis and Mello, 2005). Therefore, in our understanding, the
27 fact that COVID-19 did not have an impact on this group of emotions is related to the nature of
28 use-oriented PSS offerings.

29 Regarding the fact that past experience does not significantly moderate the effect of
30 COVID-19 on the emotions associated with use-oriented PSS adoption, the pandemic is
31 believed to cause a widespread perception of a significant threat to human life and health,
32 reducing people's sense of coherence (as demonstrated by Dymecka et al., 2020).
33 Psychologically, adequate levels of a sense of coherence allow effective stress management
34 and a reduction in the level of anxiety, which directly affects subjective well-being (Bayne,
35 2000). In a pandemic context, the fear of COVID-19 consequences expands emotional and
36 cognitive risks for different decision-making processes. Although Matiza (2020) has described
37 that individuals feel safer with what they are already familiar in a pandemic scenario, based on
38 risk perception, we believe that the physical risk related to sanitary issues, already mapped by
39 other authors in the PSS adoption strongly interferes (Armstrong et al., 2015; Edbring et al.,
40 2016).

41 About the demographic variables analysed, our study did not confirm the moderating
42 effect of gender and educational level. This result is probably supported by the fact that
43 women, usually more condescending and focused on valuing community goals (Baudrillard,
44 1998; Underhill, 2009), are being more affected by feelings of anxiety and stress during the
45 pandemic (Loxton et al., 2020; Mazza et al., 2020). As for the educational level, it is important
46 to highlight that, in studies of pro-environmental behaviour, there are still controversies

regarding the positive relationship between educational level and green behaviour (Kinnear et al., 1974; Samdahl and Robertson, 1989). Finally, our result regarding the age variable provides relevant insights on the impact of COVID-19 on emotions. In the younger consumers (between 18 and 24 years old), the negative effect of COVID-19 was greater under the emotions related to use-oriented PSS adoption. This result corroborates with previous research conducted by Losada-Baltar, et al., 2020 and González-Sanguino et al., 2020) and signals that older people tend to be more resilient in traumatic situations (Kimhi et al., 2020).

It is important to note that, as young consumers are more likely to purchase more sustainable offers (Lago et al., 2020), such as use-oriented PSS (D'Agostin et al., 2020a; Sands et al., 2020), the impact of COVID-19 on the sharing economy can be amplified if these consumers decide to avoid adopting offers shared. However, although less affected by the disease, we believe that young people are more frustrated with the limitations resulting from social isolation, which consequently affects their assessments and decision-making processes, such as those of purchase, adoption, and use. Regarding the perception of risk of contamination resulting from shared use, we infer that the perceived risk tends to be greater in older people.

5.1 Theoretical and Managerial Implications

Our results provide complementary theoretical support to the existing literature, identifying and evaluating the influence of emotions in the adoption process of use-oriented PSS. Although other studies have investigated the influence of emotional factors in the decision processes associated with pro-environmental behaviour, many studies focused on only one or two self-conscious emotions. The use of CES Scale, developed to measure emotions and feelings in consumption situations, enabled us to analyse a more comprehensive set of emotions. Therefore, a meaningful theoretical contribution of our study entails the identification of basic emotions, such as joy and love, in the process of use-oriented PSS adoption.

Another theoretical contribution of our study is the confirmation that an external traumatic event changes the emotions related to consumption. Whereas other studies have shown this before, in the context of shared consumption this study is pioneering. The data and analysis indicate that COVID-19 has increased self-interest in people, while emotions that predicted altruism and concern for society were significantly affected. Furthermore, other relevant findings include the verification that the use experience, as well as gender and education, do not significantly moderate the effect of COVID-19 on consumption emotions, although these variables have been confirmed in other studies as important moderators in pro-environmental consumption. Finally, the results presented here confirm that younger people tend to be more impacted by extreme events.

As for the managerial implications, our results can assist public and private managers in the qualification and adequacy of the use-oriented PSS offerings. First, we suggest that positive emotions such as sympathy, joy, peacefulness, love, and optimism are communicated to promote use-oriented PSS. Since the herd effect is still present in our behaviour, campaigns on social networks based on advertisements using examples focused on those emotions tend to promote engagement. Focusing on the location, availability and maintenance of the use-oriented PSS offerings is important too. The same counts for explaining the process to users, while illustrating the steps for the use procedure can minimize shame, loneliness, and fear.

During the COVID-19 pandemic, investing in hygiene protocols and clear and instructive communications is essential to reduce fear and anxiety in order to increase people's feeling of safety. As described by Cohen (2020), social scientists have long indicated that disasters, especially when the scale of their tragic consequences emerge at a constant pace, tend to catalyse social change processes. Therefore, we expect that the concern with health and sanitary issues will remain important in the post-pandemic day-to-day. Specifically, our findings show that the COVID-19 pandemic has affected the emotions of consumers of different age groups differently, as young consumers' emotions were more affected than other age groups. Hence, managers can develop specifically targeted advertisements through social media to reach young consumers (between 18 and 24 years old) and convince them of the safety measures of their PSS offers and to increase their positive emotions, especially self-conscious emotions like relief and pride, since the Z Generation has social awareness as a strong characteristic.

Product managers can also use this study's results during the creation of use-oriented PSS offers. More specifically, practitioners can act to minimize the negative impact on emotions by developing products that hold self-cleaning or sterilization mechanisms or cleaning and sanitization services. Additionally, grounded on the results, managers can change their PSSs offers. Cleaning, minimizing physical contact, choosing healthier materials, among other actions, are necessary qualifications, as well as the development of clear and persuasive communications. Such actions can provide cues that increase consumers' positive feelings as unconcern, trust, and positive surprise. Some of these practices have already been implemented by ride-sharing apps, bike-sharing services, and other use-oriented PSS offers.

5.2 Research limitations

As limitations of the research, our study did not evaluate the PSS adoption drivers and barriers in the research models, which could provide further insights on the mechanisms that lead consumers to purchase PSS and the emotions that interact with them. Also, our sample size, as well as the random distribution of people by demographic variables, such as educational level and income, limit the scope of our findings. Besides, we do not investigate the income variable. Such a point can present relevant results since people with lower incomes tend to suffer more from the pandemic because lower-income consumers seem to have more limited possibilities of social distancing and working from home.

Our study focused specifically on use-oriented PSS, and therefore, this hampers the possibility of extrapolating our findings to other PSS offerings (such as product-oriented or result-oriented). This limitation is based on the sharing and complex aspects that characterize use-oriented PSS, and as such, other studies can be carried out to analyse product and result-oriented PSS offers. We did not test consumers' personal experiences with the pandemic. And, hence, our study does not speculate regarding how personal experiences, beliefs, and norms relate to how consumers perceive the pandemic and consumption emotions. Finally, our sample was restricted to Brazilian consumers above the age of 18. This sampling limitation may cause extrapolation barriers and require further studies in other countries and with elderly consumers, for example.

6. Conclusions

1 Through a quantitative approach, our research aimed to analyse consumers' emotions
2 associated with use-oriented PSS adoption and the impact of COVID-19 on consumers'
3 emotions towards use-oriented PSS. Firstly, our findings show that consumers experience
4 more positive (than negative) emotions when adopting use-oriented PSS. From the CES scale,
5 we found that sympathy, joy, peacefulness, optimism, and love are the positive emotions most
6 triggered during use-oriented PSS adoption. Additionally, the effect of COVID-19 on emotions
7 related to the decision to use the PSS is significant. In this sense, we emphasize that basic
8 emotions, which are antecedents of social emotions, have changed in the pandemic context,
9 mainly due to the self-interest propensity. The negative impact of COVID-19 affected feelings,
10 such as trust, sympathy, unconcern, content, relief, positive surprise, optimism, enthusiasm,
11 passion, love, joy, and pride. The results show that, during the pandemic, the evaluation that
12 people make about PSS use is influenced by fear, anxiety and stress caused by trauma. Due to
13 the pandemic, factors identified as use inhibitors, prior to the global spread of the virus, seem
14 to have increased in effect magnitude and may have impacted consumers' emotions (for
15 instance sanitary issues, such as hygiene). Finally, we examined the effect of COVID-19 on
16 groups of emotions using a regression model. The findings provide evidence that the effect of
17 COVID-19 depends on consumers' age. More specifically, we show that the emotions of
18 consumers aged 24 and below were more affected by the pandemic than consumers between
19 24 and 35, and those above 35.

20 Based on our results, our key recommendations to stakeholders, such as managers and
21 policymakers, are to use positive emotions, such as sympathy, joy, peacefulness, love and
22 optimism in the promotion of use-oriented PSS. In the context of the COVID-19 pandemic, we
23 suggest stakeholders to improve and publicize hygiene protocols, as well as clear and
24 instructive communications. Such actions tend to reduce fear and anxiety, increasing people 's
25 sense of security. We also propose that product managers use these results when creating
26 use-oriented PSS offerings. In particular, professionals can act to minimize negative emotions
27 by developing products that contain mechanisms for self-cleaning or sterilization or cleaning
28 and sanitizing services. They can also change their PSS offerings to minimize physical contact
29 and choose healthier materials.

30 Recommendations for future research in this specific topic include: (1) research
31 whether the effects observed amid-COVID-19 pandemic remain in consumers' evoked set of
32 emotions (or whether they will fade away) as the pandemic gets controlled; (2) research that
33 evaluates whether there is variation in emotions according to the type of use-oriented PSS; (3)
34 studies that verify the impact of different motivations (drivers) to use-oriented PSS adoption
35 on consumer behaviour emotions moderated by the COVID-19 pandemic; and (4) replicability
36 of this research in other countries with different cultural characteristics.

37 More broadly, our recommendations for future studies involve: (1) the investigation of
38 emotions and their role in pro-environmental decision-making processes with the use of
39 neuroscience or qualitative research (with projective techniques approach); (2) the analysis of
40 the emotions influences the adoption process of product-oriented PSS and result-oriented PSS;
41 (3) exploratory studies that help the understanding of how a traumatic event like COVID-19
42 affects sustainable production and consumption; and, finally, (4) research that explains how
43 consumer emotions influence PSS in the context of sustainable consumption in cities.

44 **Acknowledgments:**

6   **References**

7   ABIHPEC SEBRAE, 2019. Trends Notebook 2019-2020. Personal Hygiene, Perfumery and
8   Cosmetics. Available in: https://abihpec.org.br/publicacao/caderno-de-tendencias-2019-2020/
9   (accessed 28 October 2019).

10   Achar, C., So, J., Agrawal, N., & Duhachek, A., 2016. What we feel and why we buy: the
11   influence of emotions on consumer decision-making. Current Opinion in Psychology, 10, 166-
12   170. https://doi.org/10.1016/j.copsyc.2016.01.009

13   Ahorsu, D. K., Lin, C. Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H., 2020. The fear
14   of COVID-19 scale: development and initial validation. International journal of Mental Health
15   and Addiction. https://link.springer.com/content/pdf/10.1007/s11469-020-00270-8.pdf

16   Ajzen, I., Fishbein, M., & Heilbroner, R. L., 1980. Understanding attitudes and predicting social
17   behavior (Vol. 278). Englewood Cliffs, NJ: Prentice-hall.

18   Ajzen, I., 1991. The theory of planned behavior. Organizational Behavior and Human Decision
19   Processes, 50(2), 179-211.

20   Akbar, P., & Hoffmann, S., 2018. Under which circumstances do consumers choose a product
21   service system (PSS)? Consumer benefits and costs of sharing in PSS. Journal of Cleaner
22   Production, 201, 416-427. https://doi.org/10.1016/j.jclepro.2018.08.010

23   Ali, F., Ashfaq, M., Begum, S., & Ali, A., 2020. How "Green" Thinking and Altruism Translate
24   into Purchasing Intentions for Electronics Products: The Intrinsic-Extrinsic Motivation
25   Mechanism. Sustainable Production and Consumption, 24, 281-291.
26   https://doi.org/10.1016/j.spc.2020.07.013

27   Amatulli, C., De Angelis, M., Peluso, A. M., Soscia, I., & Guido, G., 2019. The effect of negative
28   message framing on green consumption: An investigation of the role of shame. Journal of
29   Business Ethics, 157(4), 1111-1132. https://doi.org/10.1007/s10551-017-3644-x

30   Amir, M., & Sol, O., 1999. Psychological impact and prevalence of traumatic events in a student
31   sample in Israel: The effect of multiple traumatic events and physical injury. Journal of
32   Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies,
33   12(1), 139-154. https://doi.org/10.1023/A:1024754618063

34   Anderson Jr, W. T., Cunningham, W. H., 1972. The socially conscious consumer. The Journal of
35   Marketing, 36(3), 23-31. https://doi.org/10.1177/002224297203600305

36   Anand, P., Holbrook, M. B., & Stephens, D., 1988. The formation of affective judgments: The
37   cognitive-affective model versus the independence hypothesis. Journal of Consumer Research,
38   15(3), 386-391. https://doi.org/10.1086/209176

39   Annarelli, A., Battistella, C., & Nonino, F., 2016. Product service system: A conceptual
40   framework from a systematic review. Journal of Cleaner Production, 139, 1011-1032.
41   https://doi.org/10.1016/j.jclepro.2016.08.061

1 Antonetti, P., & Maklan, S., 2014a. Feelings that make a difference: How guilt and pride
2 convince consumers of the effectiveness of sustainable consumption choices. Journal of
3 Business Ethics, 124(1), 117-134. https://doi.org/10.1007/s10551-013-1841-9

4 Antonetti, P., & Maklan, S., 2014b. Exploring post consumption guilt and pride in the context of
5 sustainability. Psychology & Marketing, 31(9), 717-735. https://doi.org/10.1002/mar.20730

6 Araña, J. E., & León, C. J., 2009. Understanding the use of non-compensatory decision rules in
7 discrete choice experiments: the role of emotions. Ecological Economics, 68(8-9), 2316-2326.
8 https://doi.org/10.1016/j.ecolecon.2009.03.003

9 Armstrong, C. M., Niinimäki, K., Kujala, S., Karell, E., & Lang, C., 2015. Sustainable product-
10 service systems for clothing: exploring consumer perceptions of consumption alternatives in
11 Finland.   Journal   of   Cleaner   Production,   97,   30-39.
12 https://doi.org/10.1016/j.jclepro.2014.01.046

13 Bagozzi, R. P., Gopinath, M., & Nyer, P. U., 1999. The role of emotions in marketing. Journal of
14 the   Academy   of   Marketing   Science,   27(2),   184-206.
15 https://doi.org/10.1177/0092070399272005

16 Balkhy, H. H., Abolfotouh, M. A., Al-Hathlool, R. H., & Al-Jumah, M. A., 2010. Awareness,
17 attitudes, and practices related to the swine influenza pandemic among the Saudi public. BMC
18 Infectious Diseases, 10(1), 42. https://doi.org/10.1186/1471-2334-10-42

19 Bangsa, A. B., & Schlegelmilch, B. B., 2020. Linking sustainable product attributes and
20 consumer decision-making: Insights from a systematic review. Journal of Cleaner Production,
21 245, 118902. https://doi.org/10.1016/j.jclepro.2019.118902

22 Batra, R., Ahuvia, A., & Bagozzi, R. P., 2012. Brand love. Journal of Marketing, 76(2), 1-16.
23 https://doi.org/10.1509/jm.09.0339

24 Baudrillard, J., 1998. Société de consommation: Ses mythes, ses structures (Vol. 53). Sage.

25 Bayne, G., 2000. The relationship between individualism/collectivism, locus of control and
26 sense of coherence (Doctoral dissertation, University of Johannesburg).

27 Bateson, J., 1995. Managing Services Marketing: text and readings. 3. ed. Orlando: The Dryden
28 Press.

29 Bauer, R. A., 1960. Consumer behavior as risk taking. Chicago, IL, 384-398.

30 Beatson, A., Gottlieb, U., & Pleming, K., 2020. Green consumption practices for sustainability:
31 an exploration through social practice theory. Journal of Social Marketing.10 (2), 197-213.
32 https://doi.org/10.1108/JSOCM-07-2019-0102

33 Blackwell, R.D., Miniard, P.W., Engel, J.F., 2011. Consumer Behavior, tenth ed. South-Western
34 College Pub, Cincinnati (USA).

35 Bodecka, M., Nowakowska, I., Zajenkowska, A., Rajchert, J., Kaźmierczak, I., & Jelonkiewicz, I.,
36 2020. Gender as a moderator between Present-Hedonistic time perspective and depressive
37 symptoms or stress during COVID-19 lock-down. Personality and Individual Differences, 168,
38 110395. https://doi.org/10.1016/j.paid.2020.110395

Bouncken, R., Ratzmann, M., Barwinski, R., Kraus, S., 2020. Coworking spaces: Empowerment for entrepreneurship and innovation in the digital and sharing economy. Journal of Business Research, 114, 102–110. https://doi.org/10.1016/j.jbusres.2020.03.033

Bourdieu, P., 2016. La domination masculine. Le Seuil.

Boztepe, A., 2012. Green marketing and its impact on consumer buying behavior. European Journal of Economic & Political Studies, 5(1), 1-15.

Cardello, A. V., & Jaeger, S. R., 2016. Measurement of consumer product emotions using questionnaires. In Emotion measurement (pp. 165-200). Woodhead Publishing.

Carrus, G., Passafaro, P., & Bonnes, M., 2008. Emotions, habits and rational choices in ecological behaviours: The case of recycling and use of public transportation. Journal of Environmental Psychology, 28(1), 51-62. https://doi.org/10.1016/j.jenvp.2007.09.003

Castro-González, S., Bande, B., Fernández-Ferrín, P., & Kimura, T., 2019. Corporate social responsibility and consumer advocacy behaviors: The importance of emotions and moral virtues. Journal of Cleaner Production, 231, 846-855. https://doi.org/10.1016/j.jclepro.2019.05.238

Catulli, M., Cook, M., & Potter, S., 2017. Consuming use orientated product service systems: A consumer culture theory perspective. Journal of Cleaner Production, 141, 1186-1193. https://doi.org/10.1016/j.jclepro.2016.09.187

Ceschin, F., 2013. Critical factors for implementing and diffusing sustainable product-Service systems: insights from innovation studies and companies' experiences. Journal of Cleaner Production, 45, 74-88. https://doi.org/10.1016/j.jclepro.2012.05.034

Chekima, B., Wafa, S. A. W. S. K., Igau, O. A., Chekima, S., & Sondoh Jr, S. L., 2016. Examining green consumerism motivational drivers: does premium price and demographics matter to green purchasing?. Journal of Cleaner Production, 112, 3436-3450. https://doi.org/10.1016/j.jclepro.2015.09.102

Chentsova-Dutton, Y. E., & Lyons, S. H., 2016. Different Ways of Measuring Emotions Cross-Culturally. In Emotion measurement (pp. 601-628). Woodhead Publishing.

Cheung, M. F., & To, W. M., 2019. An extended model of value-attitude-behavior to explain Chinese consumers' green purchase behavior. Journal of Retailing and Consumer Services, 50, 145-153. https://doi.org/10.1016/j.jretconser.2019.04.006

Choi, D., & Johnson, K. K., 2019. Influences of environmental and hedonic motivations on intention to purchase green products: An extension of the theory of planned behavior. Sustainable Production and Consumption, 18, 145-155. https://doi.org/10.1016/j.spc.2019.02.001

Chomsky, N., 1975. Reflections on language. New York: Pantheon.

Cohen, M. J., 2020. Does the COVID-19 outbreak mark the onset of a sustainable consumption transition?, Sustainability: Science, Practice and Policy, 16(1), 1-3. https://doi.org/10.1080/15487733.2020.1740472

Cornwell, T. B., Schwepker Jr, C. H., 1992. Attitudes and intentions regarding ecologically packaged products: Subcultural variations. In Proceedings of the 1992 conference of the American Academy of Advertising, 119-121.

Cox, D. F., 1967. Synthesis-perceived risk and information handling. Risk taking and information handling in consumer behavior, 603-639.

Curwin, J. & Slater, R., 2008. Quantitative methods for business decisions. Cengage Learning EMEA.

D'Agostin, A., de Medeiros, J. F., Vidor, G., Zulpo, M., & Moretto, C. F., 2020a. Drivers and barriers for the adoption of use-oriented product-service systems: A study with young consumers in medium and small cities. Sustainable Production and Consumption, 21, 92-103. https://doi.org/10.1016/j.spc.2019.11.002.

D'Agostin, A., dos Santos Souza, A., de Medeiros, J. F., & Giacomini, A. C. V. V., 2020b. Analysing Plastic Cups Use: A Psychological Approach. In International Joint conference on Industrial Engineering and Operations Management (pp. 77-88). Springer, Cham. https://doi.org/10.1007/978-3-030-56920-4_7

DATASUS, 2020. Painel Coronavírus COVID19, Ministério da Saúde, Brasil [WWW Document]. URL https://covid.saude.gov.br/

de Medeiros, J. F., Sampaio, C. H., & Perin, M. G., 2010. Fatores emocionais no processo de tomada de decisão de compra. Psico, 41(4), 8.

de Medeiros, J. F., Ribeiro, J. L. D., & Cortimiglia, M. N., 2016. Influence of perceived value on purchasing decisions of green products in Brazil. Journal of Cleaner Production, 110, 158-169. https://doi.org/10.1016/j.jclepro.2015.07.100

Derbaix, C., Poncin, I., Droulers, O., & Roullet, B., 2012. Mesures des réactions affectives induites par des campagnes pour des causes sociales: complémentarité et convergence de mesures iconiques et verbales. Recherche et Applications en Marketing (French Edition), 27(2), 71-90. https://doi.org/10.1177/076737011202700204

Do Paço, A. M. F., Raposo, M. L. B., & Leal Filho, W., 2009. Identifying the green consumer: A segmentation study. Journal of Targeting, Measurement and Analysis for Marketing, 17(1), 17-25. https://doi.org/10.1057/jt.2008.28

Dolan, R. J., 2002. Emotion, cognition, and behavior. Science, 298(5596), 1191-1194. DOI: 10.1126/science.1076358

Dong, X., Li, H., Liu, S., Cai, C., & Fan, X., 2018. How does material possession love influence sustainable consumption behavior towards the durable products?. Journal of cleaner production, 198, 389-400. https://doi.org/10.1016/j.jclepro.2018.07.054

Duhachek, A., 2005. Coping: A multidimensional, hierarchical framework of responses to stressful consumption episodes. Journal of Consumer Research, 32(1), 41-53. https://doi.org/10.1086/426612

Dymecka, J., Gerymski, R., & Machnik-Czerwik, A., 2020. How does stress affect our life satisfaction during COVID-19 pandemic? Moderated mediation analysis of sense of coherence and fear of coronavirus. https://doi.org/10.31234/osf.io/3zjrx

1 Eagly, A. H., 1987. Reporting sex differences. American Psychologist, 42(7), 756–757.
2 https://doi.org/10.1037/0003-066X.42.7.755

3 Echegaray, F. (2021). What POST-COVID-19 lifestyles may look like? Identifying scenarios and
4 their implications for sustainability. Sustainable Production and Consumption.
5 https://doi.org/10.1016/j.spc.2021.01.025

6 Edbring, E. G., Lehner, M., & Mont, O., 2016. Exploring consumer attitudes to alternative
7 models of consumption: motivations and barriers. Journal of Cleaner Production, 123, 5-15.
8 https://doi.org/10.1016/j.jclepro.2015.10.107

9 Erevelles, S., 1998. The role of affect in marketing. Journal of Business Research, 42(3), 199-
10 215. https://doi.org/10.1016/S0148-2963(97)00118-5

11 Estrada, A., Romero, D., Pinto, R., Pezzotta, G., Lagorio, A., & Rondini, A., 2017. A Cost-
12 Engineering Method for Product-Service Systems Based on Stochastic Process Modelling:
13 Bergamo's Bike-Sharing PSS. In 9th CIRP IPSS Conference, 64, 417-422.

14 Ewing, G., & Sarigöllü, E., 2000. Assessing Consumer Preferences for Clean-Fuel Vehicles: A
15 Discrete Choice Experiment, Journal of Public Policy & Marketing, 19 (1), 106-118.
16 https://doi.org/10.1509/jppm.19.1.106.16946

17 Floyd, M. F., Gibson, H., Pennington-Gray, L., & Thapa, B., 2004. The effect of risk perceptions
18 on intentions to travel in the aftermath of September 11, 2001. Journal of Travel & Tourism
19 Marketing, 15(2-3), 19-38. https://doi.org/10.1300/J073v15n02_02

20 Fraanje, W., & Spaargaren, G., 2019. What future for collaborative consumption? A practice
21 theoretical account. Journal of Cleaner Production, 208, 499-508.
22 https://doi.org/10.1016/j.jclepro.2018.09.197

23 Frenken, K., & Schor, J., 2019. Putting the sharing economy into perspective. In A Research
24 Agenda for Sustainable Consumption Governance. Edward Elgar Publishing.

25 Gan, C., Wee, H. Y., Ozanne, L., & Kao, T., 2008. Consumers' purchasing behavior towards
26 green products in New Zealand. Innovative Marketing, 4(1), 93-102.

27 Gao, J., Zheng, P., Jia, Y., Chen, H., Mao, Y., Chen, S., ... & Dai, J., 2020. Mental health problems
28 and social media exposure during COVID-19 outbreak. Plos one, 15(4), e0231924.
29 https://doi.org/10.1371/journal.pone.0231924

30 Gardner, M. P., 1985. Mood states and consumer behavior: A critical review. Journal of
31 Consumer research, 12(3), 281-300. https://doi.org/10.1086/208516

32 Gaur, S. S., Herjanto, H., & Makkar, M., 2014. Review of emotions research in marketing,
33 2002–2013. Journal of Retailing and Consumer Services, 21(6), 917-923.
34 https://doi.org/10.1016/j.jretconser.2014.08.009

35 George, D., & Mallery, M., 2010. SPSS for Windows Step by Step: A Simple Guide and
36 Reference, 17.0 update (10a ed.) Boston: Pearson.

37 Ghose, A., & Chandra, B., 2020. Models for Predicting Sustainable Durable Products
38 Consumption Behaviour: A Review Article. Vision, 24(1), 81-89.
39 https://doi.org/10.1177/0972262919860962

Ghorbani, M., Liao, Y., Çayköylü, S., & Chand, M., 2013. Guilt, shame, and reparative behavior: The effect of psychological proximity. Journal of Business Ethics, 114(2), 311-323. https://doi.org/10.1007/s10551-012-1350-2

Godelnik, R., 2017. Millennials and the sharing economy: Lessons from a 'buy nothing new, share everything month' project. Environmental Innovation and societal transitions, 23, 40-52. https://doi.org/10.1016/j.eist.2017.02.002

González-Sanguino, C., Ausín, B., ÁngelCastellanos, M., Saiz, J., López-Gómez, A., Ugidos, C., & Muñoz, M., 2020. Mental health consequences during the initial stage of the 2020 Coronavirus pandemic (COVID-19) in Spain. Brain, Behavior, and Immunity, 87, 172-176, oi.org/10.1016/j.bbi.2020.05.040.

Hair, J. F., Babin, B. J., Anderson, R. E., Black, W. C. (2018). Multivariate data analysis (Ed 8) Intl Thomson Business Press.

Harth, N. S., Leach, C. W., & Kessler, T., 2013. Guilt, anger, and pride about in-group environmental behaviour: Different emotions predict distinct intentions. Journal of Environmental Psychology, 34, 18-26. https://doi.org/10.1016/j.jenvp.2012.12.005

Hartl, B., Sabitzer, T., Hofmann, E., & Penz, E., 2018. "Sustainability is a nice bonus" the role of sustainability in carsharing from a consumer perspective. Journal of Cleaner Production, 202, 88-100. https://doi.org/10.1016/j.jclepro.2018.08.138

Holbrook, M. B., & Hirschman, E. C., 1982. The experiential aspects of consumption: Consumer fantasies, feelings, and fun. Journal of consumer research, 9(2), 132-140. https://doi.org/10.1086/208906

Holbrook, M. B., & Gardner, M. P., 2000. Illustrating a dynamic model of the mood-updating process in consumer behavior. Psychology & Marketing, 17(3), 165-194. https://doi.org/10.1002/(SICI)1520-6793(200003)17:3<165::AID-MAR1>3.0.CO;2-5

Honea, H., & Dahl, D. W., 2005. The promotion affect scale: defining the affective dimensions of promotion. Journal of Business Research, 58(4), 543-551. https://doi.org/10.1016/S0148-2963(03)00145-0

Hooper, D., Coughlan, J., Mullen, M., 2008. Evaluating Model Fit: A synthesis of the Structural Equation Modelling Literature, in: Proceedings of the 7th European Conference on Research Methods: ECRM.

Hsu, S. H., Chuang, M. C., & Chang, C. C., 2000. A semantic differential study of designers' and users' product form perception. International Journal of Industrial Ergonomics, 25(4), 375-391. https://doi.org/10.1016/S0169-8141(99)00026-8

Huarng, K. H., & Yu, M. F., 2019. Customer satisfaction and repurchase intention theory for the online sharing economy. Review of Managerial Science, 13(3), 635-647. https://doi.org/10.1007/s11846-018-0321-0

Hwang, K., Kim, H., 2018. Are Ethical Consumers Happy? Effects of Ethical Consumers' Motivations Based on Empathy Versus Self-orientation on Their Happiness. Journal of Business Ethics, 151(2), 579-598. https://doi.org/10.1007/s10551-016-3236-1

Ingrassia, P. L., Capogna, G., Diaz-Navarro, C., Szyld, D., Tomola, S., & Leon-Castelao, E. (2020). COVID-19 crisis, safe reopening of simulation centres and the new normal: food for thought. Advances in Simulation, 5(1), 1-14. https://doi.org/10.1186/s41077-020-00131-3

Jena, S. K., & Sarmah, S. P., 2015. Measurement of consumers' return intention index towards returning the used products. Journal of Cleaner Production, 108, 818-829. https://doi.org/10.1016/j.jclepro.2015.05.115

Jiang, X., Ding, Z., Li, X., Sun, J., Jiang, Y., Liu, R., ... & Sun, W., 2020. How cultural values and anticipated guilt matter in Chinese residents' intention of low carbon consuming behavior. Journal of Cleaner Production, 246, 119069. https://doi.org/10.1016/j.jclepro.2019.119069

Jung, H. J., Choi, Y. J., & Oh, K. W., 2020. Influencing factors of chinese consumers' purchase intention to sustainable apparel products: Exploring consumer "Attitude - Behavioral Intention" gap. Sustainability, 12(5), 1770. https://doi.org/10.3390/su12051770

Kahn, B. E., & Isen, A. M., 1993. The influence of positive affect on variety seeking among safe, enjoyable products. Journal of Consumer Research, 20(2), 257-270. https://doi.org/10.1086/209347

Kanda, W., & Matschewsky, J., 2018. An exploratory expansion of the concept of product-service systems beyond products and services. In Procedia CIRP, 73, 185-190. 10.1016/j.procir.2018.03.328

Kenrick, D. T., Saad, G., & Griskevicius, V., 2013. Evolutionary consumer psychology: Ask not what you can do for biology, but.... Journal of Consumer Psychology, 23(3), 404-409. https://doi.org/10.1016/j.jcps.2013.04.003

Kilgo, D. K., & Harlow, S., 2019. Protests, media coverage, and a hierarchy of social struggle. The International Journal of Press/Politics, 24(4), 508-530. https://doi.org/10.1177/1940161219853517

Kim, H. J., & Cameron, G. T., 2011. Emotions matter in crisis: The role of anger and sadness in the publics' response to crisis news framing and corporate crisis response. Communication Research, 38(6), 826-855. https://doi.org/10.1177/0093650210385813

Kim, J., Park, T., 2020. How corporate social responsibility (CSR) saves a company: The role of gratitude in buffering vindictive consumer behavior from product failures. J. Bus. Res. 117, 461–472. https://doi.org/10.1016/j.jbusres.2020.06.024

Kim, H. K., & Niederdeppe, J., 2013. The role of emotional response during an H1N1 influenza pandemic on a college campus. Journal of Public Relations Research, 25(1), 30-50. https://doi.org/10.1080/1062726X.2013.739100

Kim, Y. J., Njite, D., & Hancer, M., 2013. Anticipated emotion in consumers' intentions to select eco-friendly restaurants: Augmenting the theory of planned behavior. International Journal of Hospitality Management, 34, 255-262. https://doi.org/10.1016/j.ijhm.2013.04.004

Kimhi, S., Marciano, H., Eshel, Y., & Adini, B., 2020. Community and national resilience and their predictors in face of terror. International Journal of Disaster Risk Reduction, 101746. https://doi.org/10.1016/j.ijdrr.2020.101746

1   King, S. C., & Meiselman, H. L., 2010. Development of a method to measure consumer
2   emotions associated with foods. Food Quality and Preference, 21(2), 168-177.
3   https://doi.org/10.1016/j.foodqual.2009.02.005

4   Kinnear, T. C., Taylor, J. R., & Ahmed, S. A., 1974. Ecologically concerned consumers: who are
5   they? Ecologically concerned consumers can be identified. Journal of Marketing, 38(2), 20-24.
6   https://doi.org/10.1177/002224297403800205

7   Kolling, C., de Medeiros, J. F., Ribeiro, J. L. D., Onwezen, M., & Marcon, A., 2020. Emotions and
8   the Purchase Decision Processes of Green Products: An Exploratory Study with Consumption
9   Emotions Set Scale (CES). In International Joint conference on Industrial Engineering and
10 Operations Management (pp. 559-571). Springer, Cham. https://doi.org/10.1007/978-3-030-
11 56920-4_46

12 Koshkaki, E. R., & Solhi, S., 2016. The facilitating role of negative emotion in decision making
13 process: A hierarchy of effects model approach. The Journal of High Technology Management
14 Research, 27(2), 119-128. https://doi.org/10.1016/j.hitech.2016.10.010

15 Kotler, P., Keller, K. L., Ancarani, F., & Costabile, M., 2014. Marketing management 14/e.
16 Pearson.

17 Kristensen, H. S., & Remmen, A., 2019. A framework for sustainable value propositions in
18 product-service systems. Journal of Cleaner Production, 223, 25-35.
19 https://doi.org/10.1016/j.jclepro.2019.03.074

20 Kumar, V., Aaker, D. A., Day, G. S., 2002. Essentials of marketing research. New York: Wiley.

21 Kumar, V., Aksoy, L., Donkers, B., Venkatesan, R., Wiesel, T., & Tillmanns, S., 2010.
22 Undervalued or overvalued customers: capturing total customer engagement value. Journal of
23 service research, 13(3), 297-310. https://doi.org/10.1177/1094670510375602

24 Lagattuta, K. H., & Thompson, R. A., 2007. The development of self-conscious emotions:
25 Cognitive processes and social influences. In J. L. Tracy, R. W. Robins, & J. P. Tangney (Eds.),
26 The self-conscious emotions: Theory and research (p. 91–113). Guilford Press.

27 Lago, N. C., Marcon, A., Ribeiro, J. L. D., de Medeiros, J. F., Brião, V. B., & Antoni, V. L., 2020.
28 Determinant attributes and the compensatory judgement rules applied by young consumers to
29 purchase environmentally sustainable food products. Sustainable Production and
30 Consumption, 23, 256-273. https://doi.org/10.1016/j.spc.2020.06.003

31 Landry, N., Gifford, R., Milfont, T.L., Weeks, A., Arnocky, S., 2018. Learned helplessness
32 moderates the relationship between environmental concern and behavior. Journal of
33 Environmental Psychology, 55, 18-22. https://doi.org/10.1016/j.jenvp.2017.12.003.

34 Laros, F. J., & Steenkamp, J. B. E., 2005. Emotions in consumer behavior: a hierarchical
35 approach. Journal of Business Research, 58(10), 1437-1445.
36 https://doi.org/10.1016/j.jbusres.2003.09.013

37 Latiff, L. A., Parhizkar, S., Zainuddin, H., Chun, G. M., Liyana, M. A. A. R. N., Ramli, N., & Yun, K.
38 L., 2012. Pandemic influenza a (H1N1) and its prevention: a cross sectional study on patients'
39 knowledge, attitude and practice among patients attending primary health Care Clinic in Kuala
40 Lumpur, Malaysia. Global Journal of Health Science, 4(2), 95. 10.5539/gjhs.v4n2p95

Lazarus, R. S., 1991. Cognition and motivation in emotion. American Psychologist, 46(4), 352. https://doi.org/10.1037/0003-066X.46.4.352

Liang, D., Hou, C., Jo, M. S., & Sarigöllü, E., 2019. Pollution avoidance and green purchase: The role of moral emotions. Journal of Cleaner Production, 210, 1301-1310. https://doi.org/10.1016/j.jclepro.2018.11.103

Liang, L. J., Choi, H. C., & Joppe, M., 2018. Exploring the relationship between satisfaction, trust and switching intention, repurchase intention in the context of Airbnb. International Journal of Hospitality Management, 69, 41-48. https://doi.org/10.1016/j.ijhm.2017.10.015

Lichtlé, M. C., & Plichon, V., 2014. Les émotions ressenties dans un point de vente: Proposition d'une échelle de mesure. Recherche et Applications en Marketing (French Edition), 29(1), 3-26. https://doi.org/10.1177/0767370113505952

Li, X., Wang, Z., Gao, C., & Shi, L., 2017. Reasoning human emotional responses from large-scale social and public media. Applied Mathematics and Computation, 310, 182-193. https://doi.org/10.1016/j.amc.2017.03.031

Llinares, C., & Page, A., 2007. Application of product differential semantics to quantify purchaser perceptions in housing assessment. Building and Environment, 42(7), 2488-2497. https://doi.org/10.1016/j.buildenv.2006.06.012

Lin, S. P., & Chan, Y. H., 2019. An Investigation on Sharing Economy Mobile Service Adoption: How Perceived Risk, Value, and Price Interact?. In International Conference on Human-Computer Interaction, 312-325. https://doi.org/10.1007/978-3-030-23560-4_23

Lin, Y., Huang, L., Nie, S., Liu, Z., Yu, H., Yan, W., & Xu, Y., 2011. Knowledge, attitudes and practices (KAP) related to the pandemic (H1N1) 2009 among Chinese general population: a telephone survey. BMC Infectious Diseases, 11(1), 128. https://doi.org/10.1186/1471-2334-11-128

Liobikiene, G., Mandravickaite, J., Bernatoniene, J., 2016. Theory of planned behavior approach to understand the green purchasing behavior in the EU: A cross-cultural study. Ecological Economics, 125, 38–46. https://doi.org/10.1016/j.ecolecon.2016.02.008

Loxton, M., Truskett, R., Scarf, B., Sindone, L., Baldry, G., & Zhao, Y., 2020. Consumer Behaviour during Crises: Preliminary Research on How Coronavirus Has Manifested Consumer Panic Buying, Herd Mentality, Changing Discretionary Spending and the Role of the Media in Influencing Behaviour. Journal of Risk and Financial Management, 13(8), 166. https://doi.org/10.3390/jrfm13080166

Losada-Baltar, A., Jiménez-Gonzalo, L., Gallego-Alberto, L., Pedroso-Chaparro, M. D. S., Fernandes-Pires, J., & Márquez-González, M., 2020. "We're staying at home". Association of self-perceptions of aging, personal and family resources and loneliness with psychological distress during the lock-down period of COVID-19. The Journals of Gerontology: Series B. https://doi.org/10.1093/geronb/gbaa048

Luce, M. F., 1998. Choosing to avoid: Coping with negatively emotion-laden consumer decisions. Journal of Consumer Research, 24(4), 409-433. https://doi.org/10.1086/209518

Luchs, M. G., Naylor, R. W., Irwin, J. R., & Raghunathan, R., 2010. The Sustainability Liability: Potential Negative Effects of Ethicality on Product Preference, Journal of Marketing, 74 (5), 18-31. https://doi.org/10.1509/jmkg.74.5.018

MacInnis, D. J., & De Mello, G. E., 2005. The concept of hope and its relevance to product evaluation and choice. Journal of Marketing, 69(1), 1-14. https://doi.org/10.1509/jmkg.69.1.1.55513

Mahesh, N., & Ganapathi, R., 2012. Influence of consumer's socio-economic characteristics and attitude on purchase intention of green products. International Journal of Business and Management, 4(5), 33-37.

Majumdar, A., Shaw, M., & Sinha, S. K., 2020. COVID-19 debunks the myth of socially sustainable supply chain: A case of the clothing industry in South Asian countries. Sustainable Production and Consumption, 24, 150-155. https://doi.org/10.1016/j.spc.2020.07.001

Malhotra, N. K., 2009. Marketing Research: An Applied Orientation. New Jersey: Prentice Hall.

Malik, Y. S., Kumar, N., Sircar, S., Kaushik, R., Bhat, S., Dhama, K., ... & Zowalaty, M. E. E., 2020. Coronavirus Disease Pandemic (COVID-19): Challenges and a Global Perspective. Pathogens, 9(7), 519. https://doi.org/10.3390/pathogens9070519

Mansbridge, J. J., 1990. On the relation of altruism and self-interest. In J. J. Mansbridge (Ed.), Beyond self-interest (p. 133–143). University of Chicago Press.

Marko, C., Andro, K., & Petrana, B., 2020. Stay home while going out–possible impacts of earthquake co-occurring with COVID-19 pandemic on mental health and vice versa. Brain, Behavior, and Immunity. 10.1016/j.bbi.2020.04.054

Mashhadi, A. R., Vedantam, A., Behdad, S., 2019. Investigation of consumer's acceptance of product-service-systems: A case study of cell phone leasing. Resources, Conservation and Recycling, 143, 36-44. https://doi.org/10.1016/j.resconrec.2018.12.006.

Matiza, T., 2020. Post-COVID-19 crisis travel behaviour: towards mitigating the effects of perceived risk. Journal of Tourism Futures. https://doi.org/10.1108/JTF-04-2020-0063

Mazza, C., Ricci, E., Biondi, S., Colasanti, M., Ferracuti, S., Napoli, C., & Roma, P., 2020. A nationwide survey of psychological distress among italian people during the COVID-19 pandemic: Immediate psychological responses and associated factors. International Journal of Environmental Research and Public Health, 17(9), 3165. https://doi.org/10.3390/ijerph17093165

Meneses, G. D., 2010. Refuting fear in heuristics and in recycling promotion. Journal of Business Research, 63(2), 104-110. https://doi.org/10.1016/j.jbusres.2009.02.002

Menzel, S., 2013. Are emotions to blame? - The impact of non-analytical information processing on decision-making and implications for fostering sustainability. Ecological Economics, 96, 71-78. https://doi.org/10.1016/j.ecolecon.2013.10.001

Midlarsky, E., 1968. Aiding responses: An analysis and review. Merrill-Palmer Quarterly of Behavior and Development, 14(3), 229-260. https://www.jstor.org/stable/23082431

Midlarsky, E., & Suda, W., 1978. Some antecedents of altruism in children: Theoretical and empirical perspectives. Psychological Reports, 43(1), 187-208. https://doi.org/10.2466/pr0.1978.43.1.187

Minton, A.P., Rose, R.L., 1997. The Effects of Environmental Concern on Environmentally Friendly Consumer Behavior: An Exploratory Study. J. Bus. Res. 40, 37–48. https://doi.org/10.1016/S0148-2963(96)00209-3

Mittal, V., Ross Jr, W. T., & Baldasare, P. M., 1998. The asymmetric impact of negative and positive attribute-level performance on overall satisfaction and repurchase intentions. Journal of marketing, 62(1), 33-47. https://doi.org/10.1177/002224299806200104

Mont, O., 2002. Drivers and barriers for shifting towards more service-oriented businesses: Analysis of the PSS field and contributions from Sweden. The Journal of Sustainable Product Design, 2(3-4), 89-103. https://doi.org/10.1023/B:JSPD.0000031027.49545.2b

Mont, O., 2004. Institutionalisation of sustainable consumption patterns based on shared use. Ecological Economics, 50(1-2), 135-153. https://doi.org/10.1016/j.ecolecon.2004.03.030

Mont, O., & Tukker, A., 2006. Product-Service Systems: reviewing achievements and refining the research agenda. Journal of Cleaner Production, 14(17), 1451-1454. https://doi.org/10.1016/j.jclepro.2006.01.017

Moro, S. R., Imhof, A. C., Fettermann, D. C., & Cauchick-Miguel, P. A., 2018. Barriers to bicycle sharing systems implementation: analysis of two unsuccessful PSS. Procedia CIRP, 73, 191-196. https://doi.org/10.1016/j.procir.2018.03.312

Mostafa, M. M., 2007. Gender differences in Egyptian consumers' green purchase behaviour: the effects of environmental knowledge, concern and attitude. International Journal of Consumer Studies, 31(3), 220-229. https://doi.org/10.1111/j.1470-6431.2006.00523.x

Naess, A., & Haukeland, P. I., 2008. Life's philosophy: Reason and feeling in a deeper world. University of Georgia Press.

Norris, F. H., 1992. Epidemiology of trauma: frequency and impact of different potentially traumatic events on different demographic groups. Journal of Consulting and Clinical Psychology, 60(3), 409. https://doi.org/10.1037/0022-006X.60.3.409

O'Connor, E.L., Sims, L., White, K.M., 2017. Ethical food choices: Examining people's Fair Trade purchasing decisions. Food Qual. Prefer. 60, 105–112. https://doi.org/10.1016/j.foodqual.2017.04.001

Oliver, R. L., 1994. Conceptual issues in the structural analysis of consumption emotion, satisfaction, and quality: Evidence in a service setting. ACR North American Advances.

Onwezen, M. C., Antonides, G., & Bartels, J., 2013. The Norm Activation Model: An exploration of the functions of anticipated pride and guilt in pro-environmental behaviour. Journal of Economic Psychology, 39, 141-153. https://doi.org/10.1016/j.joep.2013.07.005

Onwezen, M. C., Bartels, J., & Antonides, G., 2014. Environmentally friendly consumer choices: Cultural differences in the self-regulatory function of anticipated pride and guilt. Journal of Environmental Psychology, 40, 239-248. https://doi.org/10.1016/j.jenvp.2014.07.003

Paul, J., Modi, A., & Patel, J., 2016. Predicting green product consumption using theory of planned behavior and reasoned action. Journal of retailing and consumer services, 29, 123-134. https://doi.org/10.1016/j.jretconser.2015.11.006

Peloza, J., White, K., & Shang, J., 2013. Good and guilt-free: The role of self-accountability in influencing preferences for products with ethical attributes. Journal of Marketing, 77(1), 104-119. https://doi.org/10.1509/jm.11.0454

Pham, M. T., 1998. Representativeness, relevance, and the use of feelings in decision making. Journal of Consumer Research, 25(2), 144-159. https://doi.org/10.1086/209532

Pham, M. T., Cohen, J. B., Pracejus, J. W., & Hughes, G. D., 2001. Affect monitoring and the primacy of feelings in judgment. Journal of Consumer Research, 28(2), 167-188. https://doi.org/10.1086/322896

Pieri, E., 2019. Media framing and the threat of global pandemics: The Ebola crisis in UK Media and policy response. Sociological research online, 24(1), 73-92. https://doi.org/10.1177/1360780418811966

Piscicelli, L., Cooper, T., & Fisher, T., 2015. The role of values in collaborative consumption: insights from a product-service system for lending and borrowing in the UK. Journal of Cleaner Production, 97, 21-29. https://doi.org/10.1016/j.jclepro.2014.07.032

Preziosi, M., Tourais, P., Acampora, A., Videira, N., & Merli, R., 2019. The role of environmental practices and communication on guest loyalty: Examining EU-Ecolabel in Portuguese hotels. Journal of Cleaner Production, 237, 117659. https://doi.org/10.1016/j.jclepro.2019.117659

Qu, M., Yu, S., Chen, D., Chu, J., & Tian, B., 2016. State-of-the-art of design, evaluation, and operation methodologies in product service systems. Computers in Industry, 77, 1-14. https://doi.org/10.1016/j.compind.2015.12.004

Reim, W., Parida, V., & Örtqvist, D., 2015. Product–Service Systems (PSS) business models and tactics–a systematic literature review. Journal of Cleaner Production, 97, 61-75. https://doi.org/10.1016/j.jclepro.2014.07.003

Richins, M. L., 1997. Measuring emotions in the consumption experience. Journal of Consumer Research, 24(2), 127-146. https://doi.org/10.1086/209499

Rustichini, A., 2005. Emotion and reason in making decisions. Science, 310(5754), 1624-1625. DOI: 10.1126/science.1122179

Ruth, J.A., Brunel, F.F. & Otnes, C.C., 2002. Linking thoughts to feelings: Investigating cognitive appraisals and consumption emotions in a mixed-emotions context. Journal of the Academy Marketing Science, 30, 44–58. https://doi.org/10.1177/03079459994317

Samdahl, D. M., & Robertson, R., 1989. Social determinants of environmental concern: Specification and test of the model. Environment and Behavior, 21(1), 57-81. https://doi.org/10.1177/0013916589211004

Sands, S., Ferraro, C., Campbell, C., Kietzmann, J., & Andonopoulos, V. V., 2020. Who shares? Profiling consumers in the sharing economy. Australasian Marketing Journal (AMJ). https://doi.org/10.1016/j.ausmj.2020.06.005

Salman, J. E. A., & Fujita, J. S., 2018. Inovações tecnológicas baseadas na economia colaborativa ou economia compartilhada e a legislação brasileira: o caso uber. Revista de Direito, Economia e Desenvolvimento Sustentável, 4(1), 92-112.

Sarkis, J., Cohen, M. J., Dewick, P., & Schröder, P., 2020. A brave new world: lessons from the COVID-19 pandemic for transitioning to sustainable supply and production. Resources, Conservation, and Recycling, 159, 104894. 10.1016/j.resconrec.2020.104894

Schiffman, L. G., & Kanuk, L. L., 2014. Consumer Behavior, Global Edition: Global Edition.

Schmidt, D. M., Braun, F., Schenkl, S. A., & Mörtl, M., 2016. Interview study: How can Product-Service Systems increase customer acceptance of innovations?. CIRP Journal of Manufacturing Science and Technology, 15, 82-93. https://doi.org/10.1016/j.cirpj.2016.04.002

Schorr, J., (2014). Debating the Sharing Economy. In: Great Transition Initiative. https://www.greattransition.org/publication/debating-the-sharing-economy. (accessed 20 November 2018)

Schulte, F., & Voß, S., 2015. Decision support for environmental-friendly vehicle relocations in free-floating car sharing systems: The case of car2go. Procedia CIRP, 30, 275-280. https://doi.org/10.1016/j.procir.2015.02.090

Shiv, B. (2007). Emotions, decisions, and the brain. Journal of Consumer Psychology, 17(3), 174-178. https://doi.org/10.1016/S1057-7408(07)70025-6

Singh, J. J., Garg, N., Govind, R., & Vitell, S. J., 2018. Anger strays, fear refrains: The differential effect of negative emotions on consumers' ethical judgments. Journal of Business Ethics, 151(1), 235-248. https://doi.org/10.1007/s10551-016-3248-x

Sleenhoff, S., Cuppen, E., & Osseweijer, P., 2015. Unravelling emotional viewpoints on a bio-based economy using Q methodology. Public Understanding of Science, 24(7), 858-877. https://doi.org/10.1177/0047287598037000209

Snoj, B., Korda, A. P., & Mumel, D., 2004. The relationships among perceived quality, perceived risk and perceived product value. Journal of Product & Brand Management, 13(3), 156-167. https://doi.org/10.1108/10610420410538050.

Solomon, M.R., 2014. Consumer Behavior: Buying, Having, and Being, New Jersey: Prentice Hall, 11th Edition.

Sönmez, S. F., & Graefe, A. R., 1998. Determining future travel behavior from past travel experience and perceptions of risk and safety. Journal of Travel Research, 37(2), 171-177. https://doi.org/10.1177/0047287598037000209

Straughan, R. D., & Roberts, J. A., 1999. Environmental segmentation alternatives: a look at green consumer behavior in the new millennium. Journal of Consumer Marketing, 16(6), 558-575. https://doi.org/10.1108/07363769910297506

Suresh, P. S., Thejaswini, V., & Rajan, T., 2011. Factors associated with 2009 pandemic influenza A (H1N1) vaccination acceptance among university students from India during the post-pandemic phase. BMC Infectious Diseases, 11(1), 205. https://doi.org/10.1186/1471-2334-11-205

1 Sweeney, J. C., Soutar, G. N., & Johnson, L. W., 1999. The role of perceived risk in the quality-
2 value relationship: A study in a retail environment. Journal of retailing, 75(1), 77-105.
3 https://doi.org/10.1016/S0022-4359(99)80005-0

4 Swim, J. K., Stern, P. C., Doherty, T. J., Clayton, S., Reser, J. P., Weber, E. U., ... & Howard, G. S.,
5 2011. Psychology's contributions to understanding and addressing global climate change.
6 American psychologist, 66(4), 241. https://doi.org/10.1037/a0023220

7 Tavitiyaman, P., & Qu, H., 2013. Destination image and behavior intention of travelers to
8 Thailand: The moderating effect of perceived risk. Journal of travel & tourism marketing, 30(3),
9 169-185. https://doi.org/10.1080/10548408.2013.774911

10 Theotokis, A., & Manganari, E., 2015. The impact of choice architecture on sustainable
11 consumer behavior: The role of guilt. Journal of Business Ethics, 131(2), 423-437.
12 https://doi.org/10.1007/s10551-014-2287-4

13 Truelove, H.B., Gillis, A.J., 2018. Perception of pro-environmental behavior. Global
14 Environmental Change, 49, 175-185. https://doi.org/10.1016/j.gloenvcha.2018.02.009.

15 Tukker, A., 2004. Eight types of product–service system: eight ways to sustainability?
16 Experiences from SusProNet. Business Strategy and the Environment, 13(4), 246-260.
17 https://doi.org/10.1002/bse.414

18 Tukker, A., & Tischner, U., 2006. Product-services as a research field: past, present and future.
19 Reflections from a decade of research. Journal of Cleaner Production, 14(17), 1552-1556.
20 https://doi.org/10.1016/j.jclepro.2006.01.022

21 Tukker, A., 2015. Product services for a resource-efficient and circular economy–a review.
22 Journal of Cleaner Production, 97, 76-91. https://doi.org/10.1016/j.jclepro.2013.11.049

23 Tull, M. T., Edmonds, K. A., Scamaldo, K., Richmond, J. R., Rose, J. P., & Gratz, K. L., 2020.
24 Psychological Outcomes Associated with Stay-at-Home Orders and the Perceived Impact of
25 COVID-19 on Daily Life. Psychiatry Research, 113098.
26 https://doi.org/10.1016/j.psychres.2020.113098

27 Uddin, M., Mustafa, F., Rizvi, T. A., Loney, T., Suwaidi, H. A., Al-Marzouqi, A. H. H., ... &
28 Nowotny, N., 2020. SARS-CoV-2/COVID-19: Viral genomics, epidemiology, vaccines, and
29 therapeutic interventions. Viruses, 12(5), 526. https://doi.org/10.3390/v12050526

30 Underhill, P., 2009. Why we buy: The science of shopping--updated and revised for the
31 Internet, the global consumer, and beyond. Simon and Schuster.

32 Vazquez, C., & Hervas, G., 2010. Perceived benefits after terrorist attacks: The role of positive
33 and negative emotions. The Journal of Positive Psychology, 5(2), 154-163.
34 https://doi.org/10.1080/17439761003630060

35 Vigneau, E. & Qannari, E. M., 2003. Clustering of Variables Around Latent Components,
36 Journal Communications in Statistics - Simulation and Computation, 32 (4), 1131-1150.
37 https://doi.org/10.1081/SAC-120023882

38 Wang, J., & Wu, L., 2016. The impact of emotions on the intention of sustainable consumption
39 choices: Evidence from a big city in an emerging country. Journal of Cleaner Production, 126,
40 325-336. https://doi.org/10.1016/j.jclepro.2016.03.119

Watson, D., Clark, L. A., & Carey, G., 1988. Positive and negative affectivity and their relation to anxiety and depressive disorders. Journal of Abnormal Psychology, 97(3), 346. https://doi.org/10.1037/0021-843X.97.3.346

Watson, L., & Spence, M. T., 2007. Causes and consequences of emotions on consumer behaviour. European Journal of Marketing, 41 (5/6), 487-511. https://doi.org/10.1108/03090560710737570

Word Health Organization (WHO) (2020). COVID timeline [WWW Document]. URL https://www.who.int/news-room/detail/29-06-2020-covidtimeline

Wolf, C., Joye, D., Smith, T.W., Fu, Y., 2016. The SAGE Handbook of Survey Methodology. SAGE.

Wooldridge, J. M., 2016. Introductory econometrics: A modern approach. Nelson Education.

Yadav, R., Pathak, G. S., 2016. Young consumers' intention towards buying green products in a developing nation: Extending the theory of planned behavior. Journal of Cleaner Production, 135, 732-739. https://doi.org/10.1016/j.jclepro.2016.06.120

Yang, C., Dillard, J. P., & Li, R., 2018. Understanding fear of Zika: Personal, interpersonal, and media influences. Risk Analysis, 38(12), 2535-2545. https://doi.org/10.1111/risa.12973

Yates, J., 1992. Risk-taking behavior. Manchester: John Wiley & Sons.

Yin, J., Qian, L., & Singhapakdi, A., 2018. Sharing sustainability: How values and ethics matter in consumers' adoption of public bicycle-sharing scheme. Journal of Business Ethics, 149(2), 313-332. https://doi.org/10.1007/s10551-016-3043-8

Zaltman, G., 2003. How customers think: Essential insights into the mind of the market. Harvard Business Press.

Zhao, H. H., Gao, Q., Wu, Y. P., Wang, Y., Zhu, X. D., 2014. What affects green consumer behavior in China? A case study from Qingdao. Journal of Cleaner Production, 63, 143-151. https://doi.org/10.1016/j.jclepro.2013.05.021

1   **Appendix A -** Questionnaire

2

Use-oriented PSS are offers that include the **sharing of objects and leasing,** such as bike sharing apps, ride apps, coworking spaces**.** Please think about the times when you adopted a use-oriented PSS offer or think about how you would feel if you were to use a use-oriented PSS

Analyse the opposing statements below and indicate how you feel about the use-oriented PSS adoption process:

A	(-3) Definitely A	(-2) Moderately A	(-1) Slightly A	(0) Indif-ferent	(+1) Slightly B	(+2) Moderately B	(+3) Definitely B	**B**
I feel angry in the use-oriented PSS adoption	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	I feel peacefulness in the use-oriented PSS adoption
Use-oriented PSS make me feel discontent	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	Use-oriented PSS make me feel contentment
I feel worried when I use PSS	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	I feel unconcerned when I use PSS
I feel sad when I have to use PSS for products that I desire	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	I feel joy to know that I can use products that I want through PSS
I feel fear when I am using PSS	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	I trust in the performance of PSS
I can feel ashamed when I don´t know how to use PSS	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	I feel pride when I use PSS
I envy who adopted to use PSS	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	I sympathize with people who adopted to use PSS
I feel lonely when I look for use-oriented PSS	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	I feel welcomed when I search for use-oriented PSS
I hate to adopt use-oriented PSS	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	I love to find use-oriented PSS in the places
I am pessimist about the use-oriented PSS	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	I am optimist about the use-oriented PSS
I feel disappointed in the use of PSS	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	I feel enthusiasm in the use of PSS
I feel frustrated when I do not find use-oriented PSS	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	I am positively surprised when I find use-oriented PSS
I have contempt for use-oriented PSS	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	I have passion for use oriented PSS
I feel guilty when I do not use PSS	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	I feel relieved when I use PSS
The process of choosing and using PSS makes me feel eager	(-3)	(-2)	(-1)	(0)	(+1)	(+2)	(+3)	The process of chose and using PSS brings me serenity
IDENTIFICATION								
Gender:	( ) Female ( ) Male							
Age:	( ) Younger than 24 ( ) between 24 and 35 ( ) older than 35							
Education (full or incomplete):	( ) High School ( ) Bachelor ( ) Graduate							
Have you ever consumed use-oriented PSS	( ) Yes ( ) No							

3
4

5

6

Appendix B - Descriptive Statistics

Dependent Variables	Mean	SD	Skewness	Kurtosis	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	P&S	T&R	O&E
1 - Peacefulness	5.370	1.288	-0.320	-0.560	1																	
2 - Contentment	5.490	1.302	-0.590	0.050	.676	1																
3 - Unconcern	5.010	1.666	-0.680	-0.260	.567	.526	1															
4 - Joy	5.458	1.353	-0.780	0.480	.567	.546	.541	1														
5 - Trust	5.370	1.351	-0.930	0.770	.546	.559	.652	.515	1													
6 - Pride	5.542	1.365	-0.950	0.900	.425	.379	.447	.498	.491	1												
7 - Sympathy	5.813	1.170	-0.560	-0.960	.511	.576	.508	.622	.456	.508	1											
8 - Welcomed	5.448	1.265	-0.450	-0.480	.440	.432	.473	.398	.480	.520	.479	1										
9 – I love to find	5.323	1.126	0.050	-0.800	.517	.541	.396	.583	.474	.436	.603	.471	1									
10 - Optimism	5.589	1.084	-0.420	-0.410	.554	.489	.472	.553	.506	.381	.551	.440	.531	1								
11 - Enthusiasm	5.349	1.058	0.120	-1.220	.512	.540	.422	.524	.466	.403	.526	.446	.675	.617	1							
12 –Posit. Surprise	4.891	1.025	0.490	-0.450	.489	.490	.431	.442	.506	.582	.477	.453	.412	.460	.402	1						
13 - Passion	5.328	1.350	-0.690	0.210	.364	.339	.267	.493	.359	.338	.423	.264	.592	.411	.532	.279	1					
14 - Relief	5.344	1.297	-0.680	0.720	.460	.446	.526	.425	.477	.539	.444	.385	.374	.452	.295	.553	.476	1				
15 - Serenity	4.885	1.317	-0.090	-0.030	.352	.307	.368	.420	.342	.352	.436	.433	.535	.513	.544	.343	.545	.406	1			
Cronbach's alpha																				0.659	0.835	0.857
AVE																				0.3	0.5	0.4

48

	90	09	77
CR	0.6 55	0.8 36	0.8 62

Note: SD = Standard Deviation; Skewness and Kurtosis reference values for normality are between -2.0 and +2.0. Acronyms: P&S = Construct Peace and Serenity; T&R = Construct Trust and Relief; O&E = Construct Optimism and Enthusiasm; AVE = Average Variance Extracted; CR = Composite Reliability.

Independent Variable	Description	Quantity (%)		Independent Variable	Description	Quantity (%)
COVID-19	Pre-COVID-19	100 (52.1%)		**Age**	Under 24	70 (36.5%)
	Amid-COVID-19	92 (47.9%)			Between 24 and 35	72 (37.5%)
PSS use	Yes	101 (52.6%)			Older than 35	50 (26.0%)
	No	91 (47.4%)		**Education level**	High school	28 (14.6%)
Gender	Male	93 (48.4%)			Bachelor's degree	104 (54.2%)
	Female	99 (51.6%)			Graduate course	60 (31.3%)

Note: n = 192 respondents