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# The coronavirus pandemic: A window of opportunity for sustainable consumption or a time of turning away?

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## Abstract

As a means to preserve present and future generations' living conditions, sustainable consumption presents a route to the enhanced well-being of individuals. However, the occurrence of the COVID-19 pandemic raises the question of whether society is going to continue down a path of increased awareness of sustainable consumption or whether the pandemic will move people to focus more on themselves. Based on data gathered before and near the end of the first pandemic lockdown in Germany in spring 2020, this research demonstrates that ecological, social, and voluntary simplicity consciousness deteriorated in the minds of sustainability-conscious consumers, with notable impacts on their willingness to spend sustainably and their shopping affinity. Furthermore, we identify segments that show particular vulnerability to the lockdown by reacting with a decrease in their ecological consumption consciousness. This study concludes with a discussion of the pandemic's implications for the spread of sustainable consumption styles and human well-being.

## KEYWORDS

coronavirus pandemic, intervention study, sustainable consumption, well-being

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## 1 | INTRODUCTION

With the coronavirus (SARS-CoV-2) spreading across the globe from beginning of the year 2020, there have been wide-ranging impacts on people's lives. The virus is associated with the acute respiratory syndrome disease COVID-19, which sometimes has a severe to fatal disease progression. The coronavirus pandemic has occurred on a global scale, has affected a large number of people, and has led to economic pressure and turbulence. As an event compromising the lives of numerous people, causing vast economic and social damage, and requiring coordinated government resources to manage, the coronavirus pandemic fulfills the characteristic of a natural disaster. However, a crisis of this type may also give rise to opportunities for change. From J. F. Kennedy comes the following quote:

The Chinese use two brush strokes to write the word 'crisis.' One brush stroke stands for danger, the other for opportunity. In a crisis, be aware of the danger, but recognize the opportunity.

With this quote in mind, in this study, we explore whether the pandemic is more likely to promote sustainable consumption consciousness and behavior (the pandemic as "window of opportunity") or whether it is more likely to discourage it (the pandemic as a "time of turning away").

Sheth (2020) argues that consumption patterns can be greatly altered by disruptive changes in living conditions (consumption context) resulting from natural disasters. Prior research shows that emotional distress and possibly loss of possessions and jobs due to natural disasters can impact individuals' consumption behaviors and lifestyles (e.g., Forbes, 2017; Kennett-Hensel et al., 2012; Sneath et al., 2009; Sneath & Lacey, 2009). Based on a literature review of past catastrophic events (including economic contractions, natural disasters, and terrorism), Zwanka and Buff (2020) conclude that the COVID-19 pandemic, like other natural disasters, is experienced by people as a life-threatening situation. People fear for their health and lives, and they worry about job and income losses. Therefore, according to Zwanka and Buff (2020), the pandemic has the potential to trigger anxiety, stress and fear on a large scale. Initial empirical findings show that people in the course of the COVID-19 pandemic have adjusted their consumption behavior to these adverse conditions (Liu et al., 2021; Naeem, 2021; Profeta et al., 2021).

This study analyzes shifts in sustainable consumer behavior in response to the pandemic. Clearly, if it can be assumed on the basis of scientific evidence that people will adapt their consumption habits to the conditions of a disaster, then coronavirus pandemic-related changes in sustainable consumption are also possible. With regard to the COVID-19 pandemic, early survey-based studies also indicate changes in people's attitudes toward sustainable consumption (Chae, 2021; Severo et al., 2021; Tchetchik et al., 2021). However, the results of these studies are equivocal in terms of whether the pandemic has a positive or negative impact on sustainable consumer behavior. Moreover, there is a lack of experimentally designed research that can demonstrate a causal link between the pandemic and changes in sustainable consumption patterns.

Against this background, the main objective of this research is to analyze the causal impacts of the pandemic on people's consciousness of sustainable consumption (CSC), their willingness to spend money sustainably, and their shopping affinity within a one-group pretest-posttest experimental design (APA Dictionary of Psychology, 2021) during the first wave of the pandemic in 2020 in Germany. The indirect causal effects capture the impact of the pandemic on sustainable consumption, which manifests through changes in consumers' sustainable consumption consciousness. For this analysis, we use the concept proposed by Balderjahn et al. (2013) that distinguishes three dimensions of sustainable consumption consciousness: ecological, social and voluntary simplicity (see Balderjahn et al., 2013).

The pandemic will not affect everyone equally, and not everyone will change their consumption habits in the same way. It is reasonable to assume that people's demographic characteristics will influence their responses to the pandemic. Therefore, we complement our research objective by analyzing whether demographically defined consumer segments respond differently to the pandemic with changes in their CSC. More precisely, we aim to identify segments of the consumer population that are particularly vulnerable to the impacts of the pandemic with respect to sustainability consciousness. Awareness of these segments is crucial to ensure the targeted use of measures to promote sustainable consumption styles.

We focus on the responses of German consumers to the pandemic in terms of sustainable consumption patterns. Germany accounts for a considerable share of worldwide resource consumption, meaning that there is high potential for resource and emission savings through the diffusion of sustainable lifestyles in this country. Against this background, we deemed Germany suitable for analysis of the pandemic's impact on sustainable consumption. As have many other countries worldwide, to prevent further infections of the coronavirus, Germany has enforced lockdown restrictions such stay-at-home orders and closures of nonessential businesses and national borders. As part of a governmental regulatory intervention, these measures should help minimize contact between people and thus infection rates for SARS-CoV-2.

This study provides initial empirical insights into how the first lockdown in Germany (lasting for about 8 weeks in spring 2020) causally impacted consumers' sustainability consciousness and behavior and which segments of the population proved most vulnerable by reacting with a lowering of their CSC. We were able to provide these insights by conducting an experimental study interpreting the legislated pandemic lockdown as a human behavior intervention. Segmental analysis to identify particularly vulnerable groups was performed using multiple group analysis. Thus, as one of the first of its kind, this study can demonstrate a causal relationship between the 2020 coronavirus pandemic lockdown in Germany and changes in people's sustainable consumption patterns.

This study makes significant contributions to consumer theory in general and to sustainable consumer behavior in particular. We uncovered previously unknown dampening effects of life-threatening situations on sustainable consumer behavior for the coronavirus pandemic. The results suggest that during disaster experiences, the subjective importance of environmental and climate protection decreases for individuals. Analysis of consumer segments that are particularly vulnerable to a decline in their consciousness of sustainability because of the pandemic shows that, on average, consciousness of ecologically sustainable consumption is more volatile than consciousness of socially sustainable consumption and of voluntary simplicity. Our findings provide valuable insights to consumer policymakers who are attempting to counteract a pandemic-induced decline in sustainable consumption consciousness by instituting appropriate measures. Bearing in mind the need for wide-scale adoption of sustainable consumption patterns worldwide for the environment and climate (note the UN Sustainable Development Goal 12) as well as for the well-being of individuals and future generations (e.g., Balderjahn et al., 2020; Rich et al., 2017; Xiao & Li, 2011), insights into the consequences of the COVID-19 pandemic on sustainable consumer behavior are highly relevant.

## 2 | THEORETICAL BACKGROUND

The COVID-19 pandemic is a new phenomenon that poses challenges to not only virologists and epidemiologists but also the social sciences in trying to explain and understand the behavioral

adjustments of people to the disaster. Currently, there is limited scientific research on the human adaptive responses to the coronavirus pandemic that could serve as a basis for deriving hypotheses in this study. Therefore, in this study, we draw on evidence of human responses to life-threatening disasters, particularly natural disasters. Sheth (2020) argues that the COVID-19 pandemic can disrupt and change consumption patterns the way natural disasters do.

Natural disasters are ecological phenomena that occur unexpectedly and suddenly, are associated with a high level of damage to people, society, and the economy, and require government intervention to mitigate the damage (see World Health Organization, 1980). The COVID-19 pandemic shares these formal characteristics, as it has resulted in millions of deaths worldwide and has caused an economic downturn, and associated government regulations have significantly restricted people's lives and freedoms (for the socioeconomic impacts, see, e.g., Ceylan et al., 2020; Lenzen et al., 2020; Mofijur et al., 2021). Despite warnings from virologists, most countries worldwide were unprepared for the COVID-19 pandemic (Sheehan & Fox, 2020).

The importance of insights from previous disasters such as earthquakes or tsunamis in explaining human responses to the COVID-19 pandemic stems from similar adverse effects on humans: threats to life and health, risk of loss of property and assets, and risk of loss of employment. Given these comparable effects, insights from the analysis of human responses to previous natural disasters provide a suitable theoretical basis for deriving hypotheses about consumer behavior, including sustainable consumption in particular.

While the importance of personal characteristics (e.g., attitudes and values) to sustainable consumption behavior under normal circumstances is well researched (see, e.g., Balderjahn & Hüttel, 2019; Bamberg & Möser, 2007; Chekima et al., 2015; Paetz, 2020), to date, little is known about how consumers respond to disruptive life events, especially regarding sustainable consumption (Chiu et al., 2020; Schäfer et al., 2012). Usually, consumer behavior follows habitual routines that are rarely consciously reflected upon. However, if the living circumstances underlying these consumption habits change rapidly and drastically, behavioral adaptation processes are to be expected. Sheth (2020) notes that consumer behavior depends on the consumption context (e.g., technology availability), situation (e.g., supply situation), and living conditions (e.g., social relationships). These framing factors of consumption can underpin existing consumption habits, but they can also disrupt and change them. Hence, natural disasters such as earthquakes, hurricanes, and the COVID-19 pandemic have the potential to strongly impact consumption habits (Sheth, 2020).

Indeed, Kennett-Hensel et al. (2012) show that coping with disruptive life changes is associated with changes in the meaning of consumption and possessions as well as with modified modes of consumption. Hence, the COVID-19 pandemic in Europe can be expected to have the potential to change consumer behavior and sustainable consumption patterns. However, only a few survey studies were published on the effect of the COVID-19 pandemic on sustainable consumption behavior (e.g., Chae, 2021; Severo et al., 2021; Tchetchik et al., 2021) and experimental studies that can establish a causal link between the pandemic and changes in sustainable consumption patterns are lacking. To address this gap, this study adopts a one-group pretest-posttest experimental design to analyze the causal impact of the pandemic on sustainable consumer behavior.

### 3 | HYPOTHESES AND RESEARCH QUESTION

Based on research on the impacts of natural disasters (e.g., Forbes, 2017; Larson & Shin, 2018; Nishio et al., 2014; Sneath et al., 2009) and the COVID-19 pandemic (e.g., Cohen, 2020; Mathios

et al., 2020; Tonne, 2020), there are arguments for a positive impact (“window of opportunity”) of the pandemic on sustainable consumption and personal well-being as well as for an opposite effect (“time of turning away”). Considering the scenario of a “window of opportunity” for sustainable consumption, theoretical perspectives have suggested a positive effect of the coronavirus pandemic on sustainable consumption patterns (e.g., Cohen, 2020; Mathios et al., 2020; Tonne, 2020). During the lockdown, people could use time they previously spent on consumption activities, work, and travel (commuting, business, and leisure) for (recreational) activities at home, with the family, and in nature. Sandín et al. (2020) show that people under confinement valued outdoor activities more than before. The rediscovery of nature, forests and lakes could increase consciousness of the protection of nature. Thus, people might have adapted to the pandemic by recognizing the benefits of a slower pace of life, and this realization may have enhanced their appreciation of nature and voluntary simplicity, that is, a frugal and modest way of living “...that is outwardly simple and inwardly rich...” (Elgin & Mitchell, 1977, p. 13). The closure of stores, restaurants, and other service outlets through government-imposed lockdown severely limited personal consumption. Reducing consumption may have led some people to realize that they can also achieve well-being with less consumption. In this study, we relate general personal well-being (also called psychosocial well-being) to people’s ability to lead a self-determined and meaningful life (Ryff, 1989) (different from the concept of happiness). People also may have had more opportunities to reflect on and draw conclusions about their consumption habits and the consequences for the environment and society, leading to more responsible consumption choices (He & Harris, 2020). Moreover, the study by Sandín et al. (2020) revealed that during the pandemic, people learned to value personal relationships and time spent with the family more. Similarly, Baker et al. (2007, 2015) showed that people affected by a natural disaster connect more intimately to their social communities and place less importance on material possessions. In the context of the COVID-19 pandemic, feelings of increased solidarity and the need to take responsibility for others (e.g., older people) may have broadened people’s outlook to a greater interest in more sustainable lifestyles.

These arguments support the suggestion that people’s CSC may have increased during the lockdown. However, there are also good arguments that suggest the opposite, namely, a negative effect of the pandemic on sustainable consumption. A rapidly increasing body of evidence reveals that the COVID-19 pandemic, like other disasters, has caused psychological distress in the form of anxiety, panic, and depression (see reviews by Kontoangelos et al., 2020; Salari et al., 2020; Xiong et al., 2020). In consequence, the pandemic may have resulted in increased focus on the self at the expense of ethical concerns, resulting in a “time of turning away” from sustainability consciousness. Some authors have proposed that consumer decision making during the COVID-19 pandemic has been driven largely by self-interest and emotions (He & Harris, 2020), leading to panic buying and hoarding, for example (see, e.g., Naeem, 2021). The pandemic has forced people to adjust their lives and consumption patterns in a variety of ways (see, e.g., Kirk & Rifkin, 2020), tying their attention to the self and distracting them from environmental and climate change issues. In addition, the mass media have mainly reported on pandemic-specific topics, and sustainability issues have received little attention. “Fridays for the Future” demonstrations could no longer take place, and global warming disappeared almost completely from the media coverage. In this respect, the media virtually “fueled” the emergence and reinforcement of psychological stress, leaving little room to address sustainability issues. As noted above, people also needed to take responsibility for caring for others and protecting them against becoming infected. In this respect, moral licensing effects (e.g., Blanken et al., 2015) may also play a role during the COVID-19 pandemic. Moral licensing is an unconscious



mechanism in which acts of solidarity aimed at benefiting others are mentally “accounted for” as moral credits that entitle for acts that predominantly or exclusively benefit the acting individual. Through engaging in acts of solidarity during the pandemic, individuals may feel entitled to behave more selfishly in other areas of life (e.g., justifying a choice to consume less sustainably).

Balancing the arguments for a positive effect of the COVID-19 pandemic on people’s CSC (e.g., rediscovery of nature, benefits of simple living, and spending time with family) and the arguments for a negative effect (e.g., psychological distress, focus on self, one-sided media coverage, and moral licensing), we are convinced that the negative effects will outweigh the positive effects. Therefore, we formulate the following hypothesis:

**H1.** *The pandemic negatively influences respondents’ consciousness of sustainable consumption.*

Natural disasters often cause severe disruptions to economic systems (Hallegatte & Przulski, 2010). Thus, it is unsurprising that the COVID-19 pandemic is causing catastrophic economic shocks (e.g., supply chain disruptions), income losses, and higher unemployment rates worldwide. Within the European Union (EU), per capita consumption decreased by 12.3% in the second quarter of 2020 (Eurostat, 2020). This decline in consumption can be explained by the closure of stores during the lockdown, consumers’ reluctance to buy due to fears of infection (see Goolsbee & Syverson, 2021), and economic fears resulting from a drastic decline in economic output and rising unemployment. Although in Germany, the negative economic impacts of the COVID-19 pandemic were mitigated by substantial government transfers such as short-term work compensation, economic output declined by 5%, and the unemployment rate increased by ~1% in 2020 (Duell & Vetter, 2020; Federal Statistical Office of Germany, 2021).

The study by Kartseva and Kuznetsova (2020) on the economic impact of the coronavirus pandemic on the Russian population shows that one in two Russian workers can be classified as at risk of job loss and wage cuts. In a Spanish sample, in addition to fears of possible COVID-19 infection or death, fears concerning work and income were most prevalent (Sandín et al., 2020). In life-threatening situations, people are more likely to recognize the need to use limited funds wisely (Baker et al., 2015). Considering the actual economic downturn during the first wave of the pandemic in 2020 and its consequences, as well as associated negative economic projections for the future, we predict a significant decline in spending behavior for consumption purposes. Thus, we hypothesize that the Spring 2020 lockdown in Germany has significantly weakened the willingness to consume, regardless of whether the consumption is sustainable or not, compared to the pre-COVID-19 period:

**H2.** *Willingness to spend (sustainably and unsustainably) has generally decreased during the pandemic.*

In a review summarizing 10 publications on the role of consumption in recovering from a natural disaster, Daniel (2018) concludes that consumption helps reinstate the consumer’s sense of control and facilitates reconstruction of the consumer’s crisis-ridden identity. People affected by a natural disaster look for ways to cope with psychological distress and with the personal losses associated with the devastating event (Mathur et al., 2006). During a disaster, people often feel that they are losing control of their lives. In such situations, consumption can actually serve the function of helping to cope with the emotional stress caused by disasters (Sneath et al., 2009).

It has been shown that lost control can be reinstated through the consumption of utilitarian goods (e.g., clothes, towels; see Forbes, 2017). A natural disaster is a transformative event. During such transition stages, consumer vulnerability may increase, that is, a state of powerlessness connected to the consumption of marketing messages and products (e.g., Baker, 2009; Baker et al., 2005). Shopping can boost feelings of joy and pleasure (Hüttel et al., 2018); hence, consumers might indulge in impulse purchasing (i.e., unplanned, emotional, and reactive purchasing) to alleviate personal distress and depression and to compensate for unmet personal needs (Beatty & Ferrell, 1998; Kim & Derek, 2012; Rucker & Galinsky, 2008). During the COVID-19 pandemic, people may also enjoy trying out previously unused services, such as home delivery and online purchasing (Pantano et al., 2020). Moreover, for many people, possession of material goods is part of their personal self-perception and identity (e.g., Belk, 1988). Against this background, people appear to increasingly consume more hedonically oriented and pleasure-generating products that provide symbolic benefits (e.g., signaling social status) during and after catastrophic events (Forbes, 2017; Kennett-Hensel et al., 2012). An increasing desire to shop can be explained by not only people's desire to leave the COVID-19 crisis behind, but also the objective restrictions on shopping behavior during the lockdown. According to the theory of psychological reactance, people react against restrictions on their behavioral freedom by on the one hand, preferring the restricted behavior more strongly and on the other hand, seeking ways to circumvent these restrictions (Brehm, 1966). In terms of lockdown, this reaction means that the desire to be able to shop again is becoming stronger. Therefore, our third hypothesis is as follows:

**H3.** *People's shopping affinity increases in the course of the pandemic.*

In H1, we posit that the pandemic has a direct negative, attenuating impact on consumers' CSC. An understanding of the impact of the pandemic on sustainable consumer behavior requires a closer look at the indirect effects of the pandemic on sustainable consumption via consumers' CSC. Since the concept of sustainability encompasses an ecological (planet), a social (people) and an economic (prosperity) dimension, in this study, we use the CSC concept proposed by Balderjahn et al. (2013), which distinguishes between these three sustainability dimensions. Balderjahn et al. (2013) define CSC as the intention to consume in a way that improves the environmental, social and economic aspects of quality of life. The ecological dimension of the CSC model captures the awareness of purchasing products that are manufactured, packaged, or disposed of in an environmentally friendly manner, while the social dimension addresses the treatment of workers during the manufacturing process (e.g., respect for human rights, lack of discrimination). It has been shown that consciousness of ecologically and socially sustainable consumption has a positive impact on the purchase of green and fair-trade products (e.g., Balderjahn & Hüttel, 2019). In this respect, it can be expected that consciousness of ecologically and socially sustainable consumption will have a positive (negative) effect on the willingness to spend money for sustainable (unsustainable) purposes.

Consistent with H1, we expect that the direct positive effects of the ecological and social CSC dimensions on the willingness to spend sustainably will reinforce the negative effect of the pandemic on these two CSC dimensions (catalytic effect) leading to an overall negative indirect effect of the pandemic that weakens the willingness to consume sustainably. Correspondingly, the negative effects of ecological and social consumption consciousness on people's willingness to spend unsustainably counteract the negative effects of the pandemic on the ecological and social CSC dimensions (inhibition effect), leading to an overall positive indirect effect of the pandemic on unsustainable consumption options. Therefore, we hypothesize that the indirect



impact of the pandemic will be to reduce (increase) the willingness to spend money on sustainable (unsustainable) consumption options via the direct positive impact of the pandemic on consciousness of ecologically and socially sustainable consumption.

**H4a.** *Respondents' consciousness of ecologically and socially sustainable consumption mediates the influence of the pandemic by decreasing willingness to spend sustainably and increasing willingness to spend unsustainably.*

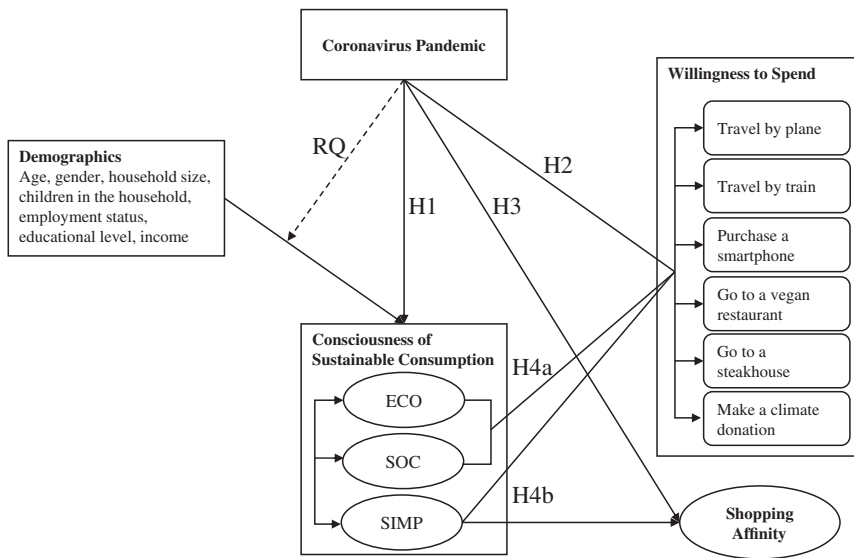
Given the particular importance attached to voluntary renunciation of consumption for environmental and climate protection as well as personal well-being (e.g., Balderjahn et al., 2020; Hüttel et al., 2020; Lorek & Spangenberg, 2014), we also consider voluntary simplicity as a third dimension of the CSC concept. According to Iyer and Muncy (2009), voluntary simplicity constitutes one form of anti-consumption. Researchers have emphasized that reduced overall consumption levels are essential to meet global sustainability goals (e.g., Hobson, 2013; Lorek & Fuchs, 2013). Voluntary simplifiers are people who distance themselves from materialism and product ownership and, out of a sense of self-determination, limit their consumption to what is necessary (Balderjahn et al., 2021; McDonald et al., 2006). They consciously buy only products that they truly need and those that best meet their needs. In addition, they strive for a meaningful life and do not perceive product renunciation as a sacrifice but rather as a gain (Etzioni, 1998; Seegebarth et al., 2016). We thus presume that voluntary simplicity consciousness exerts a negative influence on both the willingness to spend—whether sustainable or not—and consumers' affinity for shopping. Since we assume a negative, mitigating direct effect of the pandemic on the consciousness of voluntary simplicity (H1), the pandemic will have a positive, reinforcing indirect effect on the willingness to spend money and shopping affinity. Thus, we hypothesize the following:

**H4b.** *Respondents' consciousness of voluntary simplicity mediates the influence of the pandemic by increasing consumers' willingness to spend and shopping affinity.*

Beyond the analysis of the hypotheses, a further purpose of this study is to gain an understanding of whether there are certain demographically defined groups in the population of Germany whose sustainability consciousness is particularly vulnerable to the effects of the pandemic. While for some people the lockdown period might have provided more peace and relaxation, a broader share of the population has suffered psychological distress (Salari et al., 2020) and economic vulnerability. There are some indications that women, older people and workers with fewer skills and lower education levels are more likely to be affected by the negative psychological and economic impacts of the COVID-19 pandemic (Forte et al., 2020; Xiong et al., 2020). Moreover, Dang and Nguyen (2020) found that women are more likely than men to lose their jobs during the pandemic and that women's labor income also declines more significantly. However, it remains unclear how these findings might translate into changing sustainable consumption consciousness and consumption behaviors. Due to the novelty of the pandemic, no scientific studies that address this question are currently available. Consequently, we take an explorative approach in our analysis by asking the following research question:

**RQ.** *Are there segments of the population whose sustainability consciousness is particularly vulnerable to the effects of the pandemic and lockdown?*

Figure 1 depicts our conceptual framework and hypotheses.



**FIGURE 1** Conceptual framework and hypotheses. ECO, consciousness of ecologically sustainable consumption; SIMP, consciousness of voluntary simplicity; SOC, consciousness of socially sustainable consumption. The direct influences of the demographic variables on willingness to spend and shopping affinity are also included in the analyses as controls

## 4 | MEASUREMENTS

To obtain a multifaceted understanding of the effects of the pandemic on sustainability consciousness, as mentioned above, we used the CSC model developed by Balderjahn et al. (2013). For this empirical study, we used the short version of the measurement scale of Balderjahn et al. (2013) to assess respondents' consciousness of ecologically and socially sustainable consumption as well as their consciousness of voluntary simplicity. While both ecological and social consciousness focus on product manufacturing, voluntary simplicity captures respondents' disposition to buy only products that they consider necessary. All three dimensions of the CSC concept are measured using three items (see Table A1). As indicators of willingness to spend sustainably, we focused on a range of sustainable and non-sustainable consumption options (e.g., rail travel vs. air travel). We measured respondents' willingness to spend by asking, "Imagine you saved €100 in the last heating period through your economical use of energy. How likely would you be to spend the money on the following?" and providing six consumption options covering four broad consumption domains (travel, food, electronics, and donations). The answers were scored on a 5-point rating scale. The options included sustainable options (travel by train, go to a vegan restaurant, and make a climate donation) and corresponding unsustainable options (travel by plane, go to a steakhouse, and purchase a smartphone). To assess shopping affinity, the survey included two items that were used as measures of impulsive buying by Seegebarth et al. (2016), for example, "I like to go shopping every day". Table A1 provides the item formulations of the measures used in this study. For all items, previously used and validated item formulations in the German language were available. A set of demographic characteristics supplemented the questionnaire.

## 5 | DATA COLLECTION AND SAMPLING

The study builds on data obtained from a population of sustainability-conscious consumers who were surveyed online before (wave I in mid-January 2020,  $n = 2225$ ) and near the end (wave II at the end of May 2020,  $n = 2283$ ) of the first pandemic lockdown in Germany (one-group pretest (wave I)-posttest (wave II) experimental design). The first cases of COVID-19 in Germany were reported at the end of January 2020. As the number of infections increased, the German government decided on a national lockdown beginning at the end of March 2020. At the time of the second data collection at the end of May 2020, the first restrictions imposed by the lockdown had already been lifted (e.g., stores and restaurants opened again).

The two surveys were promoted via newsletters through the German online platform Utopia.de. The platform features content and a discussion forum on the topics of sustainability and sustainable consumption. With  $\sim 10$  million unique page visits per month and almost 100,000 newsletter subscribers (Utopia, 2021), the platform is one of the most popular sustainability sites in Germany. The Utopia.de platform claims that its users are predominantly female and highly educated and share a high affinity for a conscious lifestyle (Utopia, 2021). Thus, by advertising the surveys among the platform's newsletter subscribers, we could reach out to a sustainability-conscious target group.

As a form of social innovation (Jaeger-Erben et al., 2015), sustainable consumption strategies are still new and unfamiliar to many people. According to the classification of Rogers (2003), following the adoption of an innovation, 2.5% of a population can be classified as innovators, and 13.5% can be classified as early adopters. Based on the market share of organically produced foods, the number of people who currently maintain sustainable consumption styles in Germany is consistent with this classification (German Federal Ministry of Food and Agriculture, 2020). For innovations to spread, opinion leaders, that is, experts on the topic that make these practices observable to others in everyday life, are needed (Bandura, 1977; Rogers, 2003). Against this background, we selected a sample of people with high affinity for sustainability. In our view, people of this type play a decisive role in the diffusion of sustainable consumption styles, and the extent and strength of their beliefs can serve as (early) indicators of the speed at which sustainable consumption is spreading in society. The sampling approach thus allows us to assess whether the coronavirus pandemic will promote or slow the progressive penetration of sustainable consumption styles in Germany in the near future.

In 2019, Germany was the third highest-exporting country in the world (after China and the United States) and had the second-largest per capita income among the G20 countries (Federal Statistical Office of Germany, 2020a, 2020b). Through its economic power, Germany accounts for a large share of the world's consumption of natural resources. Thus, Germany is well suited for an analysis of sustainable consumption styles. Of the OECD countries, Germany had the third highest greenhouse gas emissions in 2018 (OECD, 2019). Overall, this indicates that there is high potential for better protection of natural resources and the climate in Germany, and a significant part of this potential can be achieved by increasing the diffusion of sustainable consumption styles.

Table 1 shows the socioeconomic characteristics of the samples. Most respondents were female ( $\sim 84\%$ , waves I and II), and almost half of them had university degrees. Compared to the German average, the respondents are more highly educated, earn above-average incomes and live in larger households. The mean age of the respondents in the sample, 44–45 years, is close to that of the general German population. The respondents in wave II were slightly

younger than those in the first wave. This demographic structure (more formal education and higher socioeconomic status) corresponds to that of opinion leaders (Rogers, 2003). According to the respondents' self-reporting of their previous survey participation, the samples partially overlap (31.9%).

## 6 | METHODS, ANALYSES, AND RESULTS

### 6.1 | Measurement validation

Following inspection of the data for anomalies and consistency, latent variables for the three dimensions of the CSC concept (consciousness of ecologically and socially sustainable consumption and of voluntary simplicity) and for shopping affinity were specified through exploratory and confirmatory factor analysis. A measurement model including all these latent variables showed good fit (chi-square ( $\chi^2$ )/degrees of freedom (df) = 206.749/38,  $p < 0.001$ ; root mean square error of approximation (RMSEA) = 0.031; comparative fit index (CFI) = 0.991; Tucker–Lewis index (TLI) = 0.987; and standardized root mean square residual (SRMR) = 0.018). All items but one had sufficiently high factor loadings (close to 0.7 or above) (Bagozzi & Youjae, 2012). For shopping affinity, the loading of one item was as low as 0.46. However, the latent constructs showed sufficient internal and composite reliability (Cronbach's  $\alpha > 0.70$ , composite reliability  $> 0.70$ ), convergent validity (average variance extracted  $> 0.52$ ), and discriminant validity (according to the criterion of Fornell & Larcker, 1981). Tables A1 and A2 present the psychometric properties of the latent variable measurements.

### 6.2 | Causal effects of the COVID-19 pandemic on sustainable consumer behavior

Based on the one-group pretest-posttest experimental design we analyzed the causal effects of the coronavirus pandemic, as formulated in H1 to H4, on the CSC, the willingness to spend money for sustainable/non-sustainable purposes, and shopping affinity. For hypotheses testing, we specified a structural equation model that regressed the three CSC dimensions (consciousness of ecologically and socially sustainable consumption and of voluntary simplicity), willingness to spend, and shopping affinity against the pandemic lockdown, specified as a dummy variable (wave I = 0, wave II = 1; see Figure 1). To account for the mediating influence of CSC, the three CSC dimensions were also specified as predictors of the willingness to spend and shopping affinity (H4a and H4b). Additionally, we included demographic variables (age, gender, income, education level, and employment) in our model as predictors of the three CSC dimensions, willingness to spend, and shopping affinity (see Figure 1).

Research questions, including the hypotheses, were tested by latent regression analysis using Mplus 8 and robust maximum likelihood estimation to account for the non-normal distribution of our data. According to common criteria, the fit of the resulting structural equation model was acceptable (AIC = 149042.270; sample-size adjusted BIC = 149559.653,  $\chi^2$ /df = 600.474/136,  $p < 0.001$ ; RMSEA = 0.030; CFI = 0.979; TLI = 0.958; SRMR = 0.017). We also compared the model with a model that excluded the demographic variables as controls; however, this model resulted in a worse fit to the data (AIC = 186547.736; sample-size adjusted BIC = 186874.264). The

TABLE 1 Descriptive statistics and *t* test for mean value differences

Variables		Mean <sup>a</sup> (SD)		<i>t</i> (df)
		Wave I	Wave II	
Demographics	Age (years)	45.08 (14.00)	44.16 (13.59)	2.23 (4475)*
	Gender <sup>b</sup>	0.17 (0.39)	0.17 (0.40)	-0.38 (4506)
	Household size	2.36 (1.14)	2.31 (1.15)	1.55 (4506)
	Children in the household	1.28 (0.66)	1.28 (0.65)	0.22 (4504)
	Employment status <sup>c</sup>	2.15 (0.81)	2.16 (0.81)	-6.86 (4504)
	Education level <sup>d</sup>	4.22 (0.89)	4.18 (0.91)	1.81 (4506)
	Income <sup>e</sup>	3.44 (1.69)	3.35 (1.66)	1.55 (3742)
CSC	ECO	3.70 (0.73)	3.53 (0.80)	7.27 (4481)***
	SOC	3.72 (0.82)	3.61 (0.84)	4.48 (4506)***
	SIMP	4.30 (0.65)	4.10 (0.68)	1.09 (4506)***
Willingness to spend	Travel by train	3.07 (1.35)	2.80 (1.37)	6.67 (4506)***
	Travel by plane	1.70 (1.02)	1.63 (1.02)	2.36 (4506)*
	Purchase a smartphone	1.55 (0.90)	1.56 (0.93)	-0.44 (4506)
	Go to a vegan restaurant	2.98 (1.39)	2.81 (1.40)	4.24 (4506)***
	Go to a steakhouse	1.53 (0.97)	1.46 (0.90)	2.76 (4458)**
	Make a climate donation	2.60 (1.19)	2.46 (1.15)	4.18 (4489)***
Shopping affinity		4.00 (1.73)	4.39 (1.72)	-7.46 (4506)***

Abbreviations: CSC, consciousness of sustainable consumption; ECO, consciousness of ecologically sustainable consumption; SIMP, consciousness of voluntary simplicity; SOC, consciousness of socially sustainable consumption.

<sup>a</sup>On 5-point Likert scales (except for demographics).

<sup>b</sup>0 = female, 1 = male.

<sup>c</sup>Three categories (0 = unemployed, 1 = employed part-time, 2 = employed full-time).

<sup>d</sup>Five categories (1 = lowest, 5 = highest).

<sup>e</sup>12 categories (1 = lowest, 12 = highest).

\*\*\**p* < 0.001.

\**p* < 0.05.

results presented in Table 2 show the direct as well as the indirect, sustainability-consciousness-dependent influence of the coronavirus pandemic and lockdown.

### 6.2.1 | Direct effects of the pandemic lockdown on CSC

The latent regression coefficients for the influence of the pandemic on consciousness of ecologically (ECO) and socially (SOC) sustainable consumption as well as of voluntary simplicity (SIMP) were negative and highly significant ( $\beta_{ECO} = -0.109$ ,  $\beta_{SOC} = -0.067$ ,  $\beta_{SIMP} = -0.178$ ;  $p < 0.000$ ; see Table 2). The results show that during the course of the first pandemic lockdown in Germany, CSC substantially and significantly decreased, confirming H1. Interestingly, the strongest decline occurred in consciousness of voluntary simplicity. The results of a *t* test for mean value differences between the two waves for the three CSC dimensions are consistent with this finding (see Table 1).

TABLE 2 The pandemic's effects on sustainable consumption orientation

Description of effects	Mediators	Dependent variables	Beta <sup>a</sup> (SE)	Hypotheses
Direct effects on CSC		ECO	-0.109 (0.018) <sup>***</sup>	H1 (+)
		SOC	-0.067 (0.017) <sup>***</sup>	H1 (+)
		SIMP	-0.178 (0.018) <sup>***</sup>	H1 (+)
Direct effects on willingness to spend		Travel by train	-0.085 (0.016) <sup>***</sup>	H2 (+)
		Travel by plane	-0.068 (0.016) <sup>***</sup>	H2 (+)
		Purchase a smartphone	-0.022 (0.017)	H2 (-)
		Go to a vegan restaurant	-0.044 (0.016) <sup>**</sup>	H2 (+)
		Go to a steakhouse	-0.064 (0.016) <sup>***</sup>	H2 (+)
		Make a climate donation	-0.034 (0.016) <sup>*</sup>	H2 (+)
Direct effect on ...		Shopping affinity	0.079 (0.017) <sup>***</sup>	H3 (+)
Total indirect effects on willingness to spend via CSC	CSC	Travel by train	-0.012 (0.004) <sup>**</sup>	-
	CSC	Travel by plane	0.024 (0.004) <sup>***</sup>	-
	CSC	Purchase a smartphone	0.028 (0.005) <sup>***</sup>	-
	CSC	Go to a vegan restaurant	-0.015 (0.005) <sup>**</sup>	-
	CSC	Go to a steakhouse	0.021 (0.004) <sup>***</sup>	-
	CSC	Make a climate donation	-0.035 (0.007) <sup>***</sup>	-
	CSC	Shopping affinity	0.069 (0.008) <sup>***</sup>	-
	ECO	Travel by train	-0.010 (0.003) <sup>**</sup>	H4a (+)
	ECO	Travel by plane	0.013 (0.004) <sup>**</sup>	H4a (+)
Single indirect effects on willingness to spend via ECO, SOC, and SIMP	ECO	Purchase a smartphone	0.008 (0.003) <sup>*</sup>	H4a (+)
	ECO	Go to a vegan restaurant	-0.020 (0.004) <sup>***</sup>	H4a (+)
	ECO	Go to a steakhouse	0.013 (0.004) <sup>***</sup>	H4a (+)
	ECO	Make a climate donation	-0.030 (0.005) <sup>***</sup>	H4a (+)
	SOC	Travel by train	-0.004 (0.002) <sup>*</sup>	H4a (+)





TABLE 2 (Continued)

Description of effects	Mediators	Dependent variables	Beta <sup>a</sup> (SE)	Hypotheses
	SOC	Travel by plane	0.002 (0.002)	H4a (-)
	SOC	Purchase a smartphone	-0.001 (0.002)	H4a (-)
	SOC	Go to a vegan restaurant	-0.005 (0.002)*	H4a (+)
	SOC	Go to a steakhouse	0.001 (0.002)	H4a (-)
	SOC	Make a climate donation	-0.008 (0.003)**	H4a (+)
	SIMP	Travel by train	0.002 (0.003)	H4b (-)
	SIMP	Travel by plane	0.010 (0.004)*	H4b (+)
	SIMP	Purchase a smartphone	0.020 (0.004)***	H4b (+)
	SIMP	Go to a vegan restaurant	0.010 (0.004)**	H4b (+)
	SIMP	Go to a steakhouse	0.007 (0.004)	H4b (-)
	SIMP	Make a climate donation	0.004 (0.003)	H4b (-)
Single indirect effects on shopping affinity via ECO, SOC, and SIMP	ECO	Shopping affinity	0.005 (0.003)	-
	SOC	Shopping affinity	0.002 (0.002)	-
	SIMP	Shopping affinity	0.062 (0.008)***	H4b (+)

Note: The independent variable is the coronavirus pandemic dummy variable. The direct influences of the demographic variables on the dependent variables are included in the model but not shown here.

Abbreviations: CSC, consciousness of sustainable consumption; ECO, consciousness of ecologically sustainable consumption; SIMP, consciousness of voluntary simplicity; SOC, consciousness of socially sustainable consumption.

<sup>a</sup>Standardized coefficients are shown (SEs in brackets).

\*\*\*  $p < 0.001$ .

\*\*  $p < 0.01$ .

\*  $p < 0.05$ .

## 6.2.2 | Direct effects of the pandemic lockdown on willingness to spend and shopping affinity

The coronavirus pandemic led to a significantly weaker willingness to spend for all but one of the given consumption options, partially confirming H2 (see Table 2). On buying a smartphone, the direct effect of the pandemic is nonsignificant. The pandemic particularly reduced willingness to spend on travel ( $\beta_{\text{TRAIN}} = -0.085$ ,  $p < 0.001$ ;  $\beta_{\text{PLANE}} = -0.068$ ,  $p < 0.001$ ) and eating out ( $\beta_{\text{STEAKHOUSE}} = -0.064$ ,  $p < 0.001$ ;  $\beta_{\text{VEGAN RESTAURANT}} = -0.044$ ,  $p < 0.01$ ). However, willingness to make climate donations is also significantly reduced ( $\beta = -0.034$ ,  $p < 0.05$ ). In contrast to the negative effects on the willingness to spend, the pandemic has significantly increased respondents shopping affinity ( $\beta = 0.079$ ,  $p < 0.001$ ), as proposed in H3. These findings are also in accordance with those of the  $t$  test for mean value differences between the two waves (see Table 1).

## 6.2.3 | Indirect effects of the pandemic lockdown via the impact of CSC on willingness to spend and shopping affinity

The analysis shows that weakened CSC because of the pandemic lockdown (H1) coincides with negative total indirect effects on the sustainable spending options (travel by train, go to a vegan restaurant, and make a climate donation) and positive total indirect effects on the unsustainable spending options (travel by plane, purchase a smartphone, and go to a steakhouse). The total indirect effects of the lockdown on the willingness to spend options via all three CSC dimensions are strongest for climate donation ( $\beta = -0.035$ ,  $p < 0.001$ ) and smartphone purchase ( $\beta = 0.028$ ,  $p < 0.001$ ) and weakest for traveling by train ( $\beta = -0.012$ ,  $p < 0.001$ ) (see Table 2).

In contrast to the total indirect effects (sum of the three individual effects of consciousness of ecologically and socially sustainable consumption and of voluntary simplicity), the results for the single indirect effects are mixed. Through the pandemic's weakening of consumers' consciousness of ecologically sustainable consumption, their willingness to spend money on the sustainable (unsustainable) consumption options significantly decreases (increases) ( $\beta_{\text{TRAIN}} = -0.010$ ,  $p < 0.01$ ;  $\beta_{\text{PLANE}} = 0.013$ ,  $p < 0.01$ ;  $\beta_{\text{SMARTPHONE}} = 0.008$ ,  $p < 0.05$ ;  $\beta_{\text{VEGAN RESTAURANT}} = -0.020$ ,  $p < 0.001$ ;  $\beta_{\text{STEAKHOUSE}} = 0.013$ ,  $p < 0.001$ ;  $\beta_{\text{CLIMATE DONATION}} = -0.030$ ,  $p < 0.001$ ). Attenuated consciousness of socially sustainable consumption by the pandemic significantly weakens consumers' willingness to spend money on sustainable consumption options ( $\beta_{\text{TRAIN}} = -0.004$ ,  $p < 0.05$ ;  $\beta_{\text{VEGAN RESTAURANT}} = -0.005$ ,  $p < 0.05$ ;  $\beta_{\text{CLIMATE DONATION}} = -0.008$ ,  $p < 0.01$ ), but has no significant impact on the unsustainable options. Thus, H4a is fully confirmed for consciousness of ecologically sustainable consumption but only partially confirmed for consciousness of socially sustainable consumption. The attenuated consciousness of voluntary simplicity because of the pandemic lockdown leads to a significant increase in shopping affinity ( $\beta = 0.062$ ,  $p < 0.001$ ), willingness to spend money on smartphones ( $\beta = 0.020$ ,  $p < 0.001$ ), traveling by plane ( $\beta = 0.010$ ,  $p < 0.001$ ), and visiting vegan restaurants ( $\beta = 0.010$ ,  $p < 0.001$ ). However, contrary to H4b, the indirect effects on traveling by train, visiting a steakhouse, and making a climate donation are nonsignificant (H4b is only partially confirmed, see Table 2). In summary, while the analysis fully confirms H1 and H3, we find only partial support for H2, H4a, and H4b. However, most of the sub-hypotheses are confirmed (see Table 3 for an overview).

TABLE 3 Summary of hypotheses

Hypothesis	Evaluation <sup>a</sup>
H1: The pandemic negatively influences respondents' consciousness of sustainable consumption.	Fully supported (3/3)
H2: Willingness to spend (sustainably and unsustainably) is generally reduced through the pandemic.	Partially supported (5/6)
H3: Shopping affinity is generally increased through the pandemic.	Fully supported (1/1)
H4a: Respondents' consciousness of ecologically and socially sustainable consumption mediates the influence of the pandemic by decreasing willingness to spend sustainably and increasing willingness to spend unsustainably.	Partially supported (9/12)
H4b: Respondents' consciousness of voluntary simplicity mediates the influence of the pandemic by increasing consumers' willingness to spend and shopping affinity.	Partially supported (4/7)

Note: In brackets (*i, j*), *i* = number of confirmed sub-hypotheses, *j* = number of all subhypotheses.

<sup>a</sup>Based on the number of confirmed subhypotheses relative to the total number of subhypotheses.

### 6.3 | Population group-specific vulnerability to effects of the COVID-19 pandemic

To identify the segments of the consumer population that are particularly vulnerable to the impacts of the pandemic with respect to sustainability consciousness (RQ, see Figure 1), we conducted a structural equation multiple-group analysis with the pandemic lockdown dummy as the grouping variable (otherwise, the model was specified as before). In this way, we could analyze the moderating effects of the pandemic on the relationships between the demographic variables and CSC. Before conducting the analysis, we assessed measurement invariance between the two samples (wave I and wave II) to rule out the possibility that different meanings were attributed to the measurements by the respondents in the two data collections. Based on the guidelines of Chen (2007) and Cheung and Rensvold (2002), a multiple-group confirmatory factor analysis revealed that scalar measurement invariance held between the two study waves' constructs (see Table A3 for the measurement models' fit indices and their comparative changes). Consequently, when estimating the structural equation multiple-group model, we constrained the factor loadings and the intercepts to equality across both samples. The resulting model showed good fit ( $\chi^2/df = 758.556/276$ ,  $p < 0.001$ ; RMSEA = 0.031; CFI = 0.978; TLI = 0.959; and SRMR = 0.032). The results of this moderation analysis are shown in Table 4. The table demonstrates the influence of the demographic variables on the three CSC dimensions separately for the two survey waves and reports, based on  $\chi^2$  difference tests, whether these influences differ significantly between the two waves.

Remarkably, significant changes in the influences of demographic characteristics in survey waves I and II on CSC can only be observed for consciousness of ecologically sustainable consumption. In contrast, the demographic influences on consciousness of socially sustainable consumption and of voluntary simplicity remain stable over the course of the first pandemic lockdown (see Table 4). In particular, the role of gender in the respondents' consciousness of ecologically sustainable consumption changed with the advent of the COVID-19 crisis. While in wave I, the consciousness of ecologically sustainable consumption did not differ significantly between the genders, in wave II, consciousness of ecologically sustainable consumption weakened significantly

TABLE 4 Changes in the demographic predictors of consciousness of sustainable consumption

Independent variables	CSC-variables	Beta <sup>a,b</sup> (SE)		$\Delta\chi^2$ <sup>c</sup>
		Wave I	Wave II	
Gender <sup>d</sup>	ECO	0.022 (0.025)	−0.090 (0.028)**	9.582**
Age	ECO	0.101 (0.026)***	0.061 (0.028)*	0.946
Household size	ECO	0.024 (0.034)	−0.018 (0.037)	0.802
Children in the household	ECO	0.041 (0.030)	0.035 (0.032)	0.018
Education level	ECO	0.005 (0.025)	0.092 (0.030)**	5.17*
Employment status	ECO	0.041 (0.028)	0.006 (0.030)	0.826
Income	ECO	−0.096 (0.030)**	0.003 (0.032)	5.608*
Gender <sup>d</sup>	SOC	−0.007 (0.026)	−0.057 (0.027)*	2.136
Age	SOC	0.083 (0.027)**	0.093 (0.028)**	0.116
Household size	SOC	0.008 (0.033)	0.054 (0.033)	1.058
Children in the household	SOC	0.064 (0.028)*	0.008 (0.029)	1.814
Education level	SOC	−0.018 (0.024)	0.050 (0.028)	3.544
Employment status	SOC	0.022 (0.027)	−0.007 (0.028)	0.588
Income	SOC	−0.084 (0.029)**	−0.012 (0.030)	3.218
Gender <sup>d</sup>	SIMP	−0.023 (0.026)	0.012 (0.027)	0.862
Age	SIMP	0.113 (0.027)***	0.101 (0.029)**	0.054
Household size	SIMP	0.028 (0.032)	0.022 (0.034)	0.014
Children in the household	SIMP	0.001 (0.028)	−0.003 (0.034)	0.008
Education level	SIMP	−0.054 (0.026)*	−0.057 (0.029)*	0.002
Employment status	SIMP	−0.010 (0.028)	−0.047 (0.029)	0.828
Income	SIMP	−0.090 (0.031)**	−0.046 (0.032)	0.972

Note: Multiple-group analysis was conducted with the coronavirus pandemic dummy as the grouping variable. The influences of the demographic variables and the CSC variables on willingness to spend and shopping affinity are included in the model but are not shown here.

Abbreviations: CSC, consciousness of sustainable consumption; ECO, consciousness of ecologically sustainable consumption; SIMP, consciousness of voluntary simplicity; SOC, consciousness of socially sustainable consumption.

<sup>a</sup>Standardized coefficients are shown (SEs in brackets).

<sup>b</sup>Based on scalar measurement invariance for the latent constructs.

<sup>c</sup>Based on standard log-likelihood values for equalized parameters in both groups.

<sup>d</sup>0 = female, 1 = male.

\*\*\*  $p < 0.001$ .

\*\*  $p < 0.01$ .

\*  $p < 0.05$ .

among men. Similarly, in wave II, education level has a greater effect on amplifying consciousness of ecologically sustainable consumption, although it has no significant influence in wave I. In addition, by the time of wave II, the coronavirus pandemic had neutralized the significant negative impact that income levels had on the consciousness of environmentally sustainable consumption in wave I (see Table 4). Put simply, compared to wave I, the consciousness of environmentally friendly consumption significantly weakened in wave II after the lockdown, especially among men, people with lower levels of education, and low-income earners.

## 6.4 | Robustness checks

As part of another research project, the wave I survey before the COVID-19 lockdown included an experiment designed to evaluate different social marketing tools. To rule out that the experiment influenced the estimation of the model parameters, we reran the main analysis based on a sample that included the control group from survey wave I and the full sample from wave II. However, apart from slight changes in the significance levels, presumably resulting from the smaller sample size, the coefficient values remained essentially the same. Accordingly, we concluded that the experiment did not confound the results of our analysis. Second, as part of a robustness analysis, the effects were estimated separately using the general causal mediation framework developed by Imai et al. (2010). The results were consistent with the findings obtained through the Mplus 8 estimation.

## 7 | DISCUSSION AND OUTLOOK

### 7.1 | The COVID-19 pandemic as a natural disaster

To explain the impact of the pandemic on sustainable consumption consciousness and consumption, in this paper, we drew on both relevant past research of the impact of natural disasters on human behavior and recent studies of the relationship between the coronavirus pandemic and consumer behavior. The findings of our study concerning the impact of the coronavirus pandemic on consumer behavior are consistent with observations of behavioral adjustments during natural disasters (such as earthquakes, floods, or tsunamis). While people affected by disasters react on the one hand with restrained consumption (because of economic constraints and uncertainty) (Kennett-Hensel et al., 2012), on the other hand, their desire to be able to consume “normally” again increases, as does the tendency to make impulsive purchases (Sneath et al., 2009). Changes in consumer behavior emerge because of individuals’ adjustments to the personally experienced adverse impacts of the disaster. Nishio et al. (2014) observed that after the Tohoku earthquake in Japan, the importance of environmental values had decreased among people. The present study draws a similar but much more precise conclusion: It found that sustainable consumption and sustainable consumption consciousness have declined in many facets (ecological, social and voluntary simplicity) because of the pandemic. Our study is one of the first studies to highlight and provide evidence that behavioral adjustments during the coronavirus pandemic can be explained with the large body of scientific knowledge on the effects of natural disasters on humans.

### 7.2 | A time of turning away from sustainable consumption consciousness

While Cohen (2020), Mathios et al. (2020), and Tonne (2020) and suggest that the pandemic might create opportunities for more sustainable consumption (“Window of Opportunity”), our experimental intervention analysis suggests a path of “Turning Away” from sustainable consumption consciousness and behavior, at least regarding people’s reaction to the initial Spring 2020 lockdown in Germany.

First, our analysis clearly shows that all three dimensions of the CSC (consciousness of ecologically and socially sustainable consumption and of voluntary simplicity) have deteriorated during the lockdown period. The results show how susceptible to change sustainability

consciousness is when people are facing life-threatening disasters such as the coronavirus pandemic. The particularly strong decrease in consciousness of voluntary simplicity is remarkable. The results of this study suggest that for people under lockdown, the desire to consume (more) to counteract the many constraints of the pandemic and to compensate for unmet needs is increasing. To summarize, as we hypothesized, possible positive effects of the pandemic, such as reducing work intensity and allowing people to rediscover nature and to spend more time with family, appear to be masked or suppressed by the adverse effects of the pandemic, such as psychological distress and fear of severe COVID-19 disease. Behavioral adjustments to the pandemic situation appear to draw consumers' attention away from the harm that unsustainable consumption causes to the environment, the climate, and future generations. The question that emerges is whether the sustainability consciousness of consumers (CSC) will recover to pre-pandemic levels after the pandemic or whether the loss of CSC will persist, at least in the medium term.

Second, consistent with our expectations, the study findings show a direct negative impact of the pandemic on the willingness to spend (whether sustainably or unsustainably), with one exception. On the one hand, this finding may be explained by the fact that stores were closed during the lockdown and consumers withheld consumption for fear of infection (see Goolsbee & Syverson, 2021). On the other hand, fears related to individuals' work and income situations as well as the short- to long-term economic consequences of the pandemic can explain the decreased willingness to spend for consumption purposes. Here, it can be assumed that the situation will return to normal with the end of the lockdown and the pandemic. However, the increase in consumption may be at the expense of shifting to more sustainable consumption options.

Third, in contrast to the results of negative effects of the pandemic on sustainable consumption consciousness and on the willingness to spend money, shopping affinity increased during the lockdown. As a response to the lockdown, the desire to be able to consume carefree again can be explained as a mental strategy of coping with stress (Sneath et al., 2009), as an attempt to regain control over one's own life (Daniel, 2018), and as a reaction to the shopping bans. Moreover, consumption might be an attempt to compensate for unmet needs (see Beatty & Ferrell, 1998; Kim & Derek, 2012) such as the lack of contact with friends during the pandemic. Overall, many consumers probably have a hidden need to lead a "normal life" again, to make their own decisions, and to regain the sense of pleasure and identity that led to the increase in shopping affinity. However, an excessive desire for shopping experiences leads to impulsive purchases that do not fulfill personal needs.

Fourth, in addition to analyzing the direct impacts of the pandemic on sustainable consumption consciousness and sustainable consumption, this study also aimed to analyze the indirect effects of the pandemic on consumption behavior through consumers' sustainable consumption consciousness. We observed negative total indirect effects of the COVID-19 pandemic on consumers' willingness to spend sustainably (travel by train, go to a vegan restaurant, and make a climate donation) and positive indirect effects on their willingness to spend unsustainably (travel by plane, go to a steakhouse, and purchase a smartphone). Through a positive relationship between consumers' CSC and sustainable spending, weakened sustainable consumption consciousness because of the pandemic lockdown also has an indirect negative impact on the willingness to spend money for sustainable purposes. Consequently, the pandemic has a double negative impact on sustainable consumption, that is, directly through the impact of lockdown on sustainable consumption and indirectly through the weakening



consumers' sustainable consumption consciousness. Overall, the negative direct effects of the pandemic on sustainable spending are stronger than the indirect effects.

Fifth, an examination of the indirect effects across the individual CSC dimensions shows that while the weakening of consciousness of ecologically sustainable consumption by the pandemic decreases the willingness to spend money for sustainable purposes and increases the willingness to spend money for unsustainable purposes, the weakening of consciousness of socially sustainable consumption only significantly decreases the willingness to spend money on sustainable consumption options. The weakening of the consciousness of voluntary simplicity during the pandemic leads to an increase in the willingness to travel by plane, to buy a smartphone, and to go to a vegan restaurant. The indirect effects on the other consumption options are not significant. Regarding the options "air travel" and "purchase of a smartphone," this finding can be explained by the characterization of voluntary simplifiers as a sustainable consumer group (e.g., Peyer et al., 2017; Seegebarth et al., 2016). Against this background, the significant decrease in the consciousness of voluntary simplicity triggered by the first pandemic lockdown tends to lead to more consumption of these unsustainable consumption options than of the sustainable options (travel by train and climate donation). Finally, the indirect positive effect of the pandemic via consciousness of voluntary simplicity on shopping affinity is nearly as high as the direct effect of the pandemic in this case. This result shows that the increased desire to go shopping results to a considerable degree from a shift in consumers' consciousness toward embracing more consumption-oriented lifestyles. Compared to the other two consciousness dimensions of the CSC concept, the consciousness of voluntary simplicity exerts the strongest influence on shopping affinity.

### **7.3 | Population group-specific vulnerability to effects of the COVID-19 pandemic**

The study's findings showed that men, people with lower formal education levels and lower income groups are most vulnerable to the pandemic in terms of their ecological CSC. There are some indications that people with a lower socioeconomic status are at increased risk of suffering from the psychological effects of the pandemic (e.g., Rodríguez-Rey et al., 2020; Xiong et al., 2020). Against this background, it is conceivable that this group of consumers places an increased focus on personal adaptation to the threats of the pandemic at the expense of consciousness of ecologically sustainable consumption. Moreover, this segment of the population might forego more expensive green products as a reaction to increased financial pressures and economic insecurities resulting from the pandemic. Changes in the demographic influences on CSC between the two survey waves were found only for consciousness of ecologically sustainable consumption, not for consciousness of socially sustainable consumption or of voluntary simplicity.

### **7.4 | The aftermath of the pandemic: People's well-being at risk?**

While COVID-19 has temporally improved air quality and decreased CO<sub>2</sub> emissions (e.g., (Lenzen et al., 2020; Siddique et al., 2020), the findings of this study show that the pandemic does not constitute a "window of opportunity" for sustainable consumption; rather, it is at least a short-term threat to sustainable consumption consciousness in the aftermath of

the first 3-month lockdown in Germany 2020. Overall, the findings of this study indicate that the pandemic is not a favorable time for sustainable consumption. It is a time when people have turned away from their intention to consume sustainably. Even though the willingness to consume has decreased during the pandemic, the increase in shopping affinity during the lockdown may result in a jump in private consumption after the lockdown. The psychological stress caused by the coronavirus pandemic and people's need to cope with the lockdown seem to dwarf concerns about the planet. Given the need for a shift toward greater sustainability (e.g., Assadourian, 2010) and the positive effect of sustainable consumption on not only nature but also personal and societal well-being (McGregor, 2014), the results of this study are alarming. Since our study involved sustainability-conscious people who are accelerators of sustainable consumption in their personal social networks, it can be inferred that the pandemic will slow the spread of sustainable consumption styles. Against this background, the coronavirus pandemic might pose a risk to not only people's health and mental well-being but also the environment and climate as well social sustainability.

To counteract this scenario, the campaigns of governments and possibly nongovernmental organizations should follow the two-step communication approach: target a message through the media to audiences with a high sustainability consciousness, who then further disseminate this message in their role as opinion leaders in their respective social networks (Brosius & Weimann, 1996; Nisbet & Kotcher, 2009).

## 7.5 | Implications for public policy and social marketing

Personal distress during the coronavirus pandemic has caused environmental risks to become less important to people. This change means, however, that in the long run, through an ongoing exploitation of nature by pursuing economic progress, quality of life and well-being are at risk. In this respect, it seems appropriate to take measures during a pandemic that counteract personal anxiety, fears and stress and convey confidence, including giving people freedom and restricting them as little as possible. Only if people can retain or quickly regain control over their own lives will they be more open to social and ecological challenges and be more willing to consume sustainably. However, legislation passed by the German government to reduce the number of coronavirus infections severely restricted people's behavior during the lockdown, and complementary measures to reduce psychological distress were missing. The negative consequences of this policy for sustainable consumption are highlighted in this study. Thus, the (severe) psychological consequences of the coronavirus pandemic and lockdown should not be overlooked. In the post-pandemic period, the government's primary focus should be supporting and improving the well-being in particular of those populations who suffered most from the lockdown. This focus would support not only the well-being of the people who suffered greatly from the lockdown but also the preservation of our planet.

Government policies should also identify the segments that proved particularly vulnerable in our study in terms of shifts in their CSC as the target group for measures. If the aim is to make people aware that they have to contribute to environmental and climate protection, then measures should be targeted particularly at this group.

Finally, public policy should aim, through appropriate social marketing campaigns, to merge concern for oneself with concern for environmental and climate protection in people's minds so that the well-being of the environment and climate is assigned the same value and benefit as one's well-being. Such social marketing campaigns during the coronavirus pandemic

must not stoke fears by highlighting the risk of infection and illness, but rather highlight rewarding ways to cope with the pandemic (e.g., promote mindfulness, empowerment, and self-efficacy) while evoking positive feelings (e.g., hope and humor) as well as empathy for living in a healthy natural environment. In practice, fear appeals have both weaker and unintended deleterious effects (Hastings et al., 2004; Lewis et al., 2007). Specifically, fear appeals may elicit maladaptive responses (e.g., ignoring the message, denying the danger to oneself, and developing counterarguments) that serve not to combat the danger addressed but to cope with the negative feelings evoked by the fear message. In summary, social marketing campaigns during the coronavirus pandemic should not address fear and anxiety but convey positive emotions to individuals of the possibility of a beneficial and livable future by preserving nature and the climate.

## 8 | LIMITATIONS

This study is based on data collected in an experimental one-group pretest-posttest design. This design allowed us to establish a causal link between the pandemic and the CSC and the willingness to spend money on (un)sustainable consumption options. Although this design is quasi-experimental due to the lack of a (in this case, nonexistent) control group, we recommend using such experimental designs in future studies. Surveys in which consumers are asked to retrospectively assess the effect of the pandemic on themselves must be treated with care. Due to the severe psychological stress experienced by the people affected by the pandemic, useful data on such questions cannot be guaranteed.

This empirical study focused on a segment of sustainability conscious consumers as gatekeepers for a wider diffusion of sustainable consumption lifestyles in society. For future pandemic-related research, it is important to include the entire population in a representative manner. Since the coronavirus pandemic is a global phenomenon, studies on the consequences of the pandemic on sustainable consumption should be carried out in as many countries as possible. This range would make it feasible, on the one hand, to compare different measures taken by governments to combat virus infections in the respective countries with regard to their effect on sustainable consumption consciousness. On the other hand, differences in the reactions and behavioral adjustments of people in different cultures could be observed. Due to the brief period of time that elapsed between the second survey (wave II) and the end of the lockdown in Germany, the time-lagged, medium- to long-term effects of the coronavirus pandemic on sustainability orientation are beyond the scope of this study. Therefore, it is necessary to conduct follow-up studies to determine such time-lagged effects on sustainable consumer behavior.

This study provides a highly nuanced picture of the effect of the coronavirus pandemic on sustainable consumer behavior. By using the CSC concept proposed by Balderjahn et al. (2013), the impacts of the different dimensions of CSC were disclosed in a differentiated way. Nevertheless, the pandemic and the lockdown are representative of a multitude of mechanisms that affected people during this time, but which we were unable to uncover here with regard to sustainable consumption consciousness. Therefore, future research should identify the causes and background through which the pandemic attenuates CSC. To capture consumer behavior as well, this study operationalized the intention to consume sustainably by asking about the willingness to spend money on certain sustainable and unsustainable options. This analysis was supplemented by measuring the preference to

return to pre-pandemic levels of consumption (shopping affinity). These analyses and results were informative and can serve as guidance for government policies to restore and promote sustainable consumption styles undermined by the coronavirus pandemic. However, with these sets of questions, we have captured only a selection of sustainable consumption options and were unable to analyze actual expenditures or purchases. However, since the lockdown restricts consumption and thus consumer spending through closed stores, it will be difficult to take actual purchasing behavior into account. Future research should seek solutions to this issue.

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TABLE A1 Latent variable measurements

Construct	Items	Loading <sup>a</sup>
ECO	<i>I buy a product only if I believe ...</i>	
	... that it is made from recycled materials.	0.777
	... it is packaged in an environmentally friendly manner.	0.826
	... that it is produced in a climate-friendly manner.	0.858
SOC	<i>I buy a product only if I believe that during the manufacturing of a product ...</i>	
	... workers' human rights are adhered to.	0.940
	... workers are not discriminated against.	0.910
	... workers are treated fairly or are fairly compensated.	0.910
SIMP	<i>Even if I can financially afford a product, I will buy it only if...</i>	
	... I really need the product.	0.835
	... it is a useful product for me.	0.662
	... it is absolutely necessary for me.	0.658
Shopping affinity	I like to go shopping every day.	0.464
	I enjoy shopping.	0.964

Abbreviations: ECO, consciousness of ecologically sustainable consumption; SIMP, consciousness of voluntary simplicity; SOC, consciousness of socially sustainable consumption.

<sup>a</sup>Obtained from confirmatory factor analysis based on the pooled sample.

TABLE A2 Psychometric properties of the latent measures

		$\alpha$	AVE	CR	Bivariate correlations <sup>a</sup>			
					1	2	3	4
1	ECO	8.63	0.67	0.86	0.82			
2	SOC	9.42	0.85	0.94	0.653	0.92		
3	SIMP	7.51	0.52	0.76	0.273	0.208	0.72	
4	Shopping affinity	6.11	0.57	0.70	-0.177	-0.144	-0.371	0.76

Note: Values are obtained from the pooled sample.

Abbreviations:  $\alpha$ , Cronbach's alpha; AVE, average variance extracted; CR, composite reliability; ECO, consciousness of ecologically sustainable consumption; SIMP, consciousness of voluntary simplicity; SOC, consciousness of socially sustainable consumption.

<sup>a</sup>All correlations are significant at  $p < 0.001$ ; the square root of AVE is shown on the diagonal.

TABLE A3 Measurement invariance tests

	<b>Configural invariance</b>	<b>Metric invariance</b>	<b>Scalar invariance</b>
RMSEA	0.032	0.031	0.032
CFI	0.990	0.990	0.998
TLI	0.986	0.987	0.985
SRMR	0.020	0.026	0.028
$\Delta$ RMSEA		0.001	-0.001
$\Delta$ CFI		0.000	-0.008
$\Delta$ SRMR		0.006	0.002

*Note:* Measurement model constructs for study waves I ( $N = 2225$ ) and II ( $N = 2283$ ).

Abbreviations: CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker-Lewis index.