Identifying consumer segments based on COVID-19 pandemic perceptions and responses

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Abstract
Consumer responses to the COVID-19 pandemic have varied widely. Thus, marketers need to understand consumer segments based on pandemic-related responses and behaviors. Through two studies conducted 9 months apart, we find that consumers shift from three segments in Study 1—the Apprehensive, the Prepared, and the Dismissive, to two segments in Study 2—the Dedicated and the Dismissive. The Apprehensive feel particularly threatened of the virus. The Prepared and the Dedicated perceive a lower susceptibility but still take the health threat seriously. The Dismissive downplay the threat and exhibit more negative reactions to mitigation measures. We also demonstrate between-segment downstream response differences. While the Apprehensive and the Prepared/Dedicated exhibit positive attitude toward companies enforcing guidelines, the Apprehensive engage in the most panic buying, hoarding, and stockpiling. The Dedicated also express greater stress and less life satisfaction than the Dismissive. The findings offer theoretical and practical implications for pandemic-related consumer responses.

KEYWORDS
consumer segments, COVID-19, latent class analysis, pandemic-related consumer responses
The COVID-19 pandemic, first declared in March 2020, has triggered a cascade of effects for consumers, companies, and society at large, and social distancing and lockdowns have affected operations and upended consumers’ lives (Kirk & Rifkin, 2020). While safety measures aim to contain the spread of the virus and contribute to public health, the sudden shift to social isolation is causing unanticipated psychological health consequences detrimental to consumers’ individual well-being and society’s collective well-being (Henkel et al., 2020; Tuzovic & Kabadayi, 2021). For example, Cronshaw (2021) examined the impact of lockdowns in the UK on the nation’s mental health and found that consumers participate in digital-physical activities to cope with anxiety, stress, and the lost sense of control and to form social bonds within their online communities. Meanwhile, major shifts in spending have emerged (i.e., Baker et al., 2020; Chen et al., 2021), leading to turbulent buying patterns that, alongside operational disruptions, have led to significant supply chain challenges (Hobbs, 2020). Nayal et al. (2021) as well as Pandey (2021) showed that the pandemic has modified consumers’ consumption behaviors and habits, including greater inclinations to consume local products, higher consumption hygiene and sustainability, and more online shopping. As such, the pandemic has led to a clear need to be flexible with business decisions, strategies, and models (i.e., Cortez & Johnston, 2020; Habel et al., 2020; Ritter & Petersen, 2020).

While companies have worked to determine how to adapt to the pandemic, consumer responses have appeared to sharply diverge. Initially, some consumers had strong, even panicked reactions to the pandemic, leading to isolation and increased buying of essential products (Chronopoulos et al., 2020; Prentice et al., 2020; Wang et al., 2020). As such, rampant product scarcity—for example, toilet paper and hand sanitizer—quickly emerged (Hamilton, 2021), creating supply chain problems (Esper, 2021). Meanwhile, other consumers denounced the sudden response as unnecessary because they felt the pandemic was a farce or overstated in the media. Some consumers have even exhibited violent reactions to guidelines, throwing objects, screaming, and/or coughing in the faces of people who have asked that they put on face masks or maintain appropriate physical distances (Brown, 2020). Given the widespread stories of such consumers and the apparent volume of comments decrying shutdowns, mask policies, and/or the perceived removal of personal freedoms, this consumer group appears to be sizeable.

While some initial investigations have linked perceptions of the pandemic to individual differences such as personality dimensions (Aschwanden et al., 2021) and tracked the process that consumers have followed in response to the pandemic (Kirk & Rifkin, 2020), others have shown that consumer perceptions of risk affect downstream shopping preferences, such as home delivery vs. in-store shopping (Grashuis et al., 2020). More recent research has started to examine the impact of the pandemic on outcome variables beyond purchase behaviors such as life satisfaction (Ekici & Watson, 2021), prosocial giving, and charitable donations (Jin & Ryu, 2021). However, the variation in consumer reactions has made it difficult for marketers to understand different consumer segments based on perceptions of and responses to the pandemic and what proportion of each segment exists in the overall marketplace. Although early conceptual works suggest the existence of distinct, pandemic-related consumer segments (He & Harris, 2020), research that empirically verifies these segments is scarce. Given that consumer segments differ in preferences, tastes, perceptions, and similar factors (i.e., Smith, 1956), this lack of insight raises questions as to how marketers should handle pandemic-related strategies, such as messaging/communications and supply chain/inventory preparedness, considering pandemic-related consumer segments.
Therefore, the goal of this investigation is to tackle this research deficiency and assist in identifying consumer segments based on pandemic-related perceptions and behaviors, including how consumers view companies that engage in enforcement of pandemic-related guidelines. We seek to (a) identify major consumer segments and the likely proportions of those segments using latent class analysis (LCA), (b) examine each segment’s attitudinal and behavioral responses, and (c) assess whether the segments have changed as time progresses through a second study 9 months later. We ground our work in the Extended Parallel Process Model (EPPM; Witte, 1992; Witte et al., 1996), a prominent health communication theory, and the theory of reasoned action (TRA; Fishbein & Ajzen, 1975), which has been widely applied to understand health behavior. We chose the EPPM and TRA to ground our investigation as the EPPM, unlike many other theories, is specifically designed to offer insights and predictions into how consumers respond to perceived health threats and communication messages about the threats (Dutta-Bergman, 2005), and that the TRA links the perceptions and attitudes arising from threat perceptions to downstream behavior. Our goal is to provide marketers and policy makers with insights into pandemic-related consumer segments (including important characteristics such as age, gender, income, employment, and political leanings to assist in outwardly identifying those segments) and how different segments are likely to respond to companies that have implemented guidelines or policies related to the pandemic. Moreover, given the damaging psychological impact of the pandemic on consumers, including exacerbating stress and deteriorating work and life satisfaction, we hope to use our research findings to assist in devising public policies to improve consumer well-being.

2 | THE CORONAVIRUS PANDEMIC AND CONSUMER RESPONSES

Although the COVID-19 pandemic is novel, consumers tend to respond in predictable ways to health crises, enabling the use of frameworks such as the EPPM (i.e., Witte, 1992) and the TRA (Fishbein & Ajzen, 1975) to better understand consumers’ health attitude and behavior and to identify segments within the context of the current coronavirus pandemic. The EPPM posits that when individuals face a threat, they assess the situation as a function of four factors—self-efficacy, response efficacy, perceived severity of the threat, and perceived susceptibility to the threat. While self-efficacy is the perceived ability to act, response efficacy refers to the perception that any actions taken will adequately address the threat. Perceived severity of and susceptibility to the threat indicates individuals’ perceptions of how severe the threat is to them and how susceptible they think they are to the threat. If an individual considers a threat as low in either severity or susceptibility, then the individual lacks the motivation to engage in assessing efficacies and to proceed to act against the threat. However, if the individual views the threat as significant in either severity or susceptibility, then the individual’s efficacy judgment will result in the domination of either a protection motivation or a defensive motivation. While protection motivation arises when high perceived threat is coupled with robust efficacy beliefs, defensive motivation surfaces when perceived threat is high but perceived efficacy is low. Protection motivation “arouses, sustains, and directs activity” (Rogers, 1975, p. 98) to manage the perceived threat and yields cognitions and behaviors to avert the threat through danger control strategies (Witte, 1992). In contrast, individuals operating under a defensive motivation have increased fear but lack the perceived efficacy to prevent the danger and therefore resort to fear control strategies and maladaptive approaches. The EPPM has been applied to a variety of contexts in
which safety/security threats are present. While some of these contexts are unrelated to physical health (e.g., Johnston & Warkentin, 2010; Moody et al., 2018), other investigations have centered more on the health domain (e.g., Liu et al., 2016).

The TRA, on the other hand, offers a parsimonious theoretical explication of volitional human behavior whereby the theory postulates that behavior is determined by intention to perform the behavior, which in turn is contingent upon attitude and subjective norms toward the behavior. The TRA has been widely utilized in the health domain to explain and predict a broad spectrum of health behaviors (see Montaño & Kasprzyk, 2015 for a review). In the current context of the COVID-19 pandemic, for example, drawing upon the TRA, Wang et al. (2021) demonstrated the influence of attitude and normative beliefs toward the COVID-19 recommended preventive practices in people’s adherence to these preventive practices through a large-scale online survey conducted in the United States and Canada in the early peak of the pandemic. Similarly, Lueck and Spiers (2020) utilized the TRA framework to determine the salient beliefs and attitudes that impacted people’s intention to get vaccinated against COVID-19.

In summary, health crises such as the COVID-19 pandemic represent threats, which lead consumers to an evaluative process in which they gauge the threat’s likely effects on them and then develop strategies for addressing the threat accordingly. As such, the EPPM and TRA together offer an ideal framework to predict consumer perceptions and behaviors in response to the coronavirus pandemic. To reiterate the goals of the work, we seek to (a) identify major consumer segments and the likely proportions of those segments, (b) examine each segment’s attitudinal and behavioral responses, and (c) assess whether the segments have changed as time progresses through a second study 9 months later. Since we seek to investigate segments based on perceptions of, attitudes toward, and responses to the pandemic, cluster analysis using LCA is appropriate for determining the likely compositions of those segments. LCA is a model-based clustering approach whereby consumers are assumed to belong to one of K latent classes, with the number of classes and their sizes unknown a priori (Vermunt & Magidson, 2005). LCA offers advantages over traditional ad-hoc clustering methods. These advantages include the ability to provide statistical tests to assess model fit, the ability to provide formal criteria to make decisions about the appropriate number of clusters, the choice of a cluster criterion being less arbitrary due to the underlying statistical model, the ability to simultaneously estimate clusters and covariate effects on the clusters, the ability to include observed variables of different scaling and measurement levels, and less biased estimations of class-specific means due to the probabilistic nature of cluster membership in LCA (Wedel & Kamakura, 2002; Karnowski, 2017). LCA has been used to identify and differentiate segments of consumers in various research contexts such as logistics (e.g., Garver et al., 2008), business traveling (e.g., Millán et al., 2016), and non-adopters of earthquake insurance among Turkish consumers (Adigüzel et al., 2019).

3  | DEFINING THE VARIABLES FOR CLUSTER ANALYSIS

We specified the variables for the cluster analysis based on the EPPM and the TRA and included additional variables relevant to the context of the coronavirus pandemic. We illustrate how these variables align with the relevant dimensions of the EPPM and delineate pathways of consumers’ likely responses (see Figure 1). All scaled variables were measured with seven-point Likert-type or semantic-differential items.

We included perceived threat, susceptibility, and fear because these measures were important to establish the overall threat appraisal of the coronavirus. Items for measuring perceived
threat and susceptibility were based on Witte et al. (1996); (e.g., “I believe that coronavirus is a severe health threat” and “I am at risk for getting coronavirus”). Fear was assessed with three items adapted from Block and Keller (1995) and Laroche et al. (2001), with anchor words “fearful,” “nervous,” and “scared.” We measured participants’ perceived self-efficacy in abiding by preventative guidelines with items adapted from Witte et al. (1996); (e.g., “I am able to practice social distancing to prevent getting coronavirus”). As a measure of response efficacy, we included items tapping respondents’ attitude toward the recommended preventive measures such as social distancing, handwashing, and wearing face masks. News media have revealed several examples of negative responses to companies that enforce guidelines (e.g., Brown, 2020). Although these consumers are apparently few, their actions represent a broader negative view of companies with strict guidelines in a negative light. Thus, we measured perceptions of and responses to companies with pandemic-related guidelines.

Because consumers generally form downstream responses such as behaviors and behavioral intentions based on attitudes according to the TRA (Fishbein & Ajzen, 1975), we measured consumers’ attitude toward companies that enforce pandemic-related measures using three pairs of anchor words “undesirable/desirable,” “unfavorable/favorable,” and “dislike them/like them.” We also assessed consumers’ attitude toward the general societal coronavirus narrative. If consumers perceive the coronavirus as less serious than the general narrative suggests, then these consumers are likely to form downstream perceptions and behaviors in line with that attitude (i.e., reduced compliance with guidelines). We measured this variable using items adapted from Witte et al. (1996); (e.g., “Coronavirus is a hoax”).

In addition, we evaluated the likelihood that consumers would, in the future, patronize those companies that enforce guidelines with three pairs of anchor words: “definitely not/definitely,” “probably not/probably,” and “unlikely/likely.” Further, we measured intention to follow the recommended preventive guidelines with three items based on Witte et al. (1996); (e.g., “I intend to practice social distancing for as long as it takes”).

Many consumers have responded to the pandemic through goods-related danger control strategies. While some sought rationally to build personal stockpiles, others have engaged in
more extreme danger control behaviors, including panic buying and hoarding. To gauge these behaviors, we asked respondents to indicate their level of agreement to a set of four statements (e.g., “I have hoarded important items”). Further, in the face of uncertainty, some consumers have resorted to fear control strategies such as reactance and denial. To tap this, we adapted Witte et al.’s (1996) defensive avoidance scale and asked respondents to indicate their first instinct when they first heard about coronavirus, with endpoints “want to/ not want to do something to keep myself from getting coronavirus.” Relatedly, we assessed participants’ perceived stress and satisfaction with life, using Karam et al.’s (2012) four-item scale and Diener et al.’s (1985) five-item scale, respectively. We also measured respondents’ anti-vaccination beliefs and vaccination intention using items adapted from Hornsey et al.’s (2018) work.

Consumer perceptions of and responses to the coronavirus pandemic appear to have varied considerably as a function of political leanings. Although not within a coronavirus context, research has examined the impact of political ideology on consumer reactions to consumption regulations (Irmak et al., 2020), which is conceptually like pandemic guidelines. Thus, we suspect that political leanings may influence perceptions of and responses to the coronavirus pandemic. Consequently, we measured overall political ideology with a semantic-differential item (“extremely liberal/extremely conservative”).

Finally, we collected demographics information, including gender (female vs. male vs. other), age (in years), race/ethnicity, and household income. Additionally, because the pandemic has also magnified an employment-related status—essential versus non-essential worker—we included essentiality of one’s job in the survey and asked study participants to respond to the question, “Is your line of work considered essential (e.g., health care personnel, first responders, teachers, postal service workers, public transit workers, and grocery store workers)?”

4 | METHODOLOGY AND RESULTS

4.1 | Pretest

We first conducted a pretest using exploratory factor analysis (EFA) with a sample of undergraduate and MBA students from a large southwestern university in the United States (n = 124; 39.5% male; M_age = 27.97, SD_age = 8.51) to assess the reliability and construct validity of the multi-item measurement scales. We evaluated factor loadings and cross-loadings to assess constructs’ convergent and discriminant validity. We also calculated Cronbach’s alpha for each construct to assess the construct’s reliability. In our evaluation, we followed the guidelines that item factor loadings should be greater than 0.4 and that Cronbach’s α values should be greater than 0.7 (Cronbach & Meehl, 1955; Nunnally, 1978; Peter, 1979, 1981). EFA results with principal components analysis and Varimax rotation showed that the measurement items for threat, susceptibility, fear, self-efficacy, attitude toward companies, purchase intention, and intention to follow the measures loaded on their respective constructs properly, with factor loadings ranging from 0.624 to 0.954, all exceeding the recommended threshold of 0.4. However, two items for attitude toward the measures (i.e., “Social distancing” and “Stay-at-home orders”) loaded on intention to follow the measures. A third item (i.e., “Wearing facemasks/coverings in public spaces”) loaded on a separate factor. In addition, one item for attitude toward the narrative (i.e., “Coronavirus is a hoax”) loaded on a separate factor. Because of these cross-loadings, we removed these four items from further analysis. We then calculated Cronbach’s α based on the
retained items. The Cronbach’s α values were 0.928, 0.866, 0.965, 0.764, 0.965, 0.993, 0.877, 0.802, and 0.915 for threat, susceptibility, fear, self-efficacy, attitude toward companies, purchase intention, intention to follow the measures, attitude toward the measures, and attitude toward the narrative, respectively, all exceeding the recommended threshold of 0.70.

4.2 | Study 1

Panelists from Amazon Mechanical Turk (MTurk) participated in study 1 in exchange for monetary compensation during May 2020 (n = 489; 60.5% male; M_age = 37.79, SD_age = 11.11). Before conducting the LCA, we performed confirmatory factor analysis (CFA) to assess construct validity and reliability for threat, susceptibility, fear, self-efficacy, attitude toward the measures, intention to follow the measures, attitude toward the narrative, attitude toward companies, and purchase intention.

The initial run indicated acceptable model fit (χ² = 882.979, df = 341, RMSEA = 0.057, GFI = 0.891, CFI = 0.959). However, the discriminant validity between self-efficacy and intention to follow the measures was not supported. The average variance extracted (AVE) for self-efficacy was less than the squared correlations between self-efficacy and intention to follow the measures. Modification indices (M.I.) revealed one problematic self-efficacy item (i.e., “I am capable of abiding by the stay-at-home order for as long as it takes”), which had high M.I. with items from other constructs, including attitude toward the narrative, attitude toward the measures, and intention to follow the measures. It is possible that the wording, “for as long as it takes,” obscured what the construct intended to measure, which is the belief in one’s ability to perform the recommended COVID-19 preventive measures. Consequently, we removed this item and reran the CFA with the remaining two self-efficacy items. The results indicated an acceptable model fit with a slight improvement (χ² = 754.48, df = 314, RMSEA = 0.054, GFI = 0.903, CFI = 0.965). All constructs in the final measurement model demonstrated satisfactory reliability and convergent and discriminant validities (Hair et al., 2009, see Tables 1 and 2).

We next proceeded with a subsequent cluster analysis per Punj and Stewart (1983), employing LCA.

4.2.1 | Results from latent class model estimation for study 1

We used the poLCA package (PolytomousVariable Latent Class Analysis) within Rversion 3.6.3 (Holding the Windsock; https://www.r-project.org/). In conducting the latent class analysis (LCA), we followed Vermunt and Magidson’s (2005) and Adigüzel et al.’s (2019) procedure.

We included threat, susceptibility, fear, self-efficacy, attitude toward the measures, and attitude toward the narrative as predictor variables in the LCA. We also included political leanings as a predictor because political differences seem to have fueled perspectives of and responses to the pandemic (e.g., Boynton et al., 2021; Mendes, 2020). Age, gender, income, and respondents’ line of work (i.e., essential vs. nonessential workers) were covariates. When deciding the final number of segments, we relied on multiple criteria, including Bayesian information criterion (BIC), Akaike information criterion (AIC), chi-squared goodness-of-fit test (χ²), entropy, model parsimony, and interpretability of the segments. Model quality with the inclusion of covariates was evaluated by likelihood ratio tests (G2). Although BIC and AIC are both well-accepted information criteria for model selection based on the parsimony criteria in LCA, the BIC
TABLE 1  Multi-item measures, factor loadings, CR, and AVE for study 1 and study 2

| Construct and items | Factor loadings (Study 1/Study 2) | CR (Study 1/ Study 2) | AVE (Study 1/ Study 2) |
|---------------------|-----------------------------------|-----------------------|-----------------------|
| Threat              |                                   |                       |                       |
| • I believe that coronavirus is a severe health threat. | 0.949/0.941 |                       |                       |
| • I believe that coronavirus is a serious health threat. | 0.925/0.977 |                       |                       |
| • I believe that coronavirus is a significant health threat. | 0.907/0.949 |                       |                       |
| Susceptible         |                                   |                       |                       |
| • I am at risk for getting coronavirus. | 0.796/0.691 |                       |                       |
| • It is likely that I will contract coronavirus.a | 0.845/— |                       |                       |
| • People who live with me are at risk for getting coronavirus. | 0.748/0.662 |                       |                       |
| • It is likely that people I care for will contract coronavirus. | 0.794/0.78 |                       |                       |
| Self-efficacy       |                                   |                       |                       |
| • I am able to practice social distancing to prevent getting coronavirus. | 0.779/0.707 |                       |                       |
| • I am capable of doing what the medical experts have recommended, for example, hand washing, avoiding face touching, and wearing face masks/coverings in public spaces. | 0.854/0.858 |                       |                       |
| Fear                |                                   |                       |                       |
| • Fearful           | 0.962/0.977                       |                       |                       |
| • Nervous           | 0.939/0.96                       |                       |                       |
| • Scared            | 0.868/0.88                       |                       |                       |
| Att_narrative       |                                   |                       |                       |
| • The threat of coronavirus is overstated. | 0.876/0.846 |                       |                       |
| • News media are exaggerating the danger of coronavirus. | 0.947/0.969 |                       |                       |
| • News media’s narratives about the threat of coronavirus appear to be overblown. | 0.958/0.977 |                       |                       |
| Att_measures        |                                   |                       |                       |
| • Handwashing       | 0.842/0.792                       |                       |                       |
| • Avoiding face touching | 0.87/0.758                 |                       |                       |
| Int_measures        |                                   |                       |                       |
| • I intend to practice social distancing for as long as it takes. | 0.9/0.865 |                       |                       |

(Continues)
| Construct and items                                                                 | Factor loadings (Study 1/Study 2) | CR (Study 1/Study 2) | AVE (Study 1/Study 2) |
|----------------------------------------------------------------------------------|----------------------------------|---------------------|----------------------|
| • I intend to follow the stay-at-home order for as long as it takes.              | 0.832/0.772                      |                     |                      |
| • I will continue to wear face masks/coverings when I need to go out and be in public spaces in the future. | 0.737/0.86                      |                     |                      |
| • It is very likely that I will keep practicing social distancing in the future.  | 0.866/0.787                      |                     |                      |
| • I will continue to do what medical experts have recommended until it is safe to stop, e.g., frequent hand washing and avoiding touching face and nose. | 0.843/0.862                      |                     |                      |
| Att_comp                                                                         | 0.922/0.970                      | 0.970/0.915         |                      |
| • Undesirable-desirable                                                          | 0.923/0.923                      |                     |                      |
| • Unfavorable-favorable                                                          | 0.906/0.963                      |                     |                      |
| • Dislike it-like it                                                              | 0.941/0.982                      |                     |                      |
| Int_comp                                                                         | 0.946/0.978                      | 0.853/0.938         |                      |
| • Would definitely not/Would definitely shop with them                            | 0.887/0.945                      |                     |                      |
| • Would probably not/Would probably shop with them                                | 0.87/0.989                       |                     |                      |
| • Unlikely/Likely to shop with them                                               | 0.92/0.971                       |                     |                      |
| Stress\(^b\)                                                                      | 0.855                            | 0.746               |                      |
| • In the last month, how often have you felt that you were unable to control the important things in your life? | —/0.84                          |                     |                      |
| • In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? | —/0.887                         |                     |                      |
| SWL\(^b\)                                                                         | 0.9                               | 0.752               |                      |
| • In most ways my life is close to my ideal.                                      | —/0.911                          |                     |                      |
| • The conditions of my life are excellent.                                       | —/0.923                          |                     |                      |
| • So far I have gotten the important things I want in life.                       | —/0.757                          |                     |                      |
| Concern_vax\(^b\)                                                                | 0.843                            | 0.734               |                      |
| • I am concerned that the COVID-19 vaccine might not be safe.                     | —/0.704                          |                     |                      |
| • I am concerned that the COVID-19 vaccine might not prevent the coronavirus disease. | —/0.979                          |                     |                      |
statistic is most often used to determine the appropriate number of latent classes in a data set because of its relative simplicity (Forster, 2000; Lin & Dayton, 1997; Linzer & Lewis, 2011). Compared to AIC, BIC also helps avoid selecting over-fitted models and is effective in detecting correct models (Adigüzel et al., 2019; Vermunt & Magidson, 2005).

As can be seen in Table 3, the three-segment model had the lowest BIC, indicating the model was superior to others based on the parsimony criteria. Further, although the AIC exhibited a decreasing pattern from the one-segment model to the six-segment model, the advantage of decreased AIC was offset by increased model complexity resulting from more parameters being included in model estimation. Based on Nylund et al.’s (2007) recommendation, our evaluation of these criteria led to the selection of a three-segment model with the covariates being included in the model (see Table 3 and Figure 2). To validate the robustness of the three-segment model and to assess the model’s internal stability, we conducted jackknife resampling analysis by repeating the model selection procedure 500 times on subsamples randomly drawn from resampling 95% of the total sample of 487 observations. The mean and median of BICs from the jackknife resampling analysis showed a consistent pattern that the three-segment model outperformed the other models (i.e., Table 4 and Figure 3).

The p values of the Wald statistics for the predictor variables were all significant and below 0.001 (Table 5), indicating the ability of these variables to distinguish the three segments. The $R^2$ displays how much variance of each indicator is explained by the three-segment model. The significant indicators in order of importance based on $R^2$ were attitude toward the narrative (59.39%), threat (42.29%), political leanings (30.47%), self-efficacy (27.55%), susceptibility (25.84%), fear (23%), and attitude toward the measures (19.68%). We describe each consumer segment below.

**Segment 1: The Prepared**

Segment 1 was the largest (47.02% of participants) and exhibited the highest perceived threat of the virus ($M = 6.616, SD = 0.12$). They scored the second highest on fear of ($M = 4.533, SD = 0.21$) and susceptibility to the virus ($M = 4.336, SD = 0.16$). However, segment 1 respondents also scored the highest on self-efficacy ($M = 6.659, SD = 0.11$), indicating these

| Construct and items | Factor loadings (Study 1/Study 2) | CR (Study 1/Study 2) | AVE (Study 1/Study 2) |
|---------------------|-----------------------------------|---------------------|----------------------|
| Int_vax$^b$         |                                   | 0.988               | 0.966                |
| • Would definitely not/Would definitely get vaccinated | —/0.979               |                     |                      |
| • Would probably not/Would probably get vaccinated | —/0.99                |                     |                      |
| • Unlikely/Likely to get vaccinated | —/0.979               |                     |                      |

Abbreviations: Att_comp, attitude toward companies enforcing the preventive measures; Att_measures, attitude toward the preventive measures; Att_narrative, attitude toward the coronavirus narrative; AVE, average variance extracted; Concern_vax, concerns about the vaccine; CR, composite reliability; Int_comp, intention to purchase from companies enforcing the preventive measures; Int_measures, intention to follow the preventive measures; Int_vax, Intention to get vaccinated; SWL, satisfaction with life.

$^a$Indicates item dropped due to low factor loading in Study 2.

$^b$Indicates items measured in Study 2 only.
|                  | Threat | Susceptible | Self-efficacy | Fear   | Att_narrative | Att_measures | Int_measures | Att_comp | Int_comp |
|------------------|--------|-------------|---------------|--------|---------------|--------------|--------------|----------|----------|
| Threat           | 0.927  |             |               |        |               |              |              |          |          |
| Susceptible      | 0.372  | 0.796       |               |        |               |              |              |          |          |
| Self-efficacy    | 0.601  | 0.072       | 0.817         |        |               |              |              |          |          |
| Fear             | 0.468  | 0.575       | 0.103         | 0.924  |               |              |              |          |          |
| Att_narrative    | −0.606 | −0.036      | −0.467        | −0.169 | 0.928         |              |              |          |          |
| Att_measures     | 0.507  | 0.078       | 0.592         | 0.175  | −0.373        | 0.856        |              |          |          |
| Int_measures     | 0.741  | 0.211       | 0.814         | 0.272  | −0.603        | 0.602        | 0.837        |          |          |
| Att_comp         | 0.523  | 0.125       | 0.616         | 0.156  | −0.409        | 0.438        | 0.628        | 0.893    |          |
| Int_comp         | 0.662  | 0.214       | 0.575         | 0.274  | −0.508        | 0.525        | 0.739        | 0.691    | 0.923    |

*Note: Numbers on the diagonal are the square root of AVEs; off-diagonal numbers are inter-construct correlations.*
| Model               | Entropy | N   | Npar | resid.df | LL_ratio | AIC    | BIC    | $\chi^2$ |
|---------------------|---------|-----|------|----------|----------|--------|--------|----------|
| 1-Segment Model     | Study 1 | NA  | 487  | 41       | 446      | 4994.72| 10975.13| 11146.85| 35789813.47|
|                     | Study 2 | NA  | 530  | 40       | 490      | 4421.15| 10973.95| 11144.86| 18171540.63|
| 2-Segment Model     | Study 1 | 0.826| 487  | 88       | 399      | 4334.44| 10384.11| 10752.68| 4694072.38  |
|                     | Study 2 | 0.848| 530  | 86       | 444      | 3761.31| 10396.68| 10764.15| 310054.61   |
| 3-Segment Model     | Study 1 | 0.857| 487  | 135      | 352      | 4079.15| 10169.28| 10734.69| 1223892.95  |
|                     | Study 2 | 0.78 | 530  | 132      | 398      | 3512.57| 10224.37| 10788.39| 365268.03   |
| 4-Segment Model     | Study 1 | 0.879| 487  | 182      | 305      | 3827.21| 9996.85 | 10759.12| 379699.58   |
|                     | Study 2 | 0.752| 530  | 178      | 352      | 3437.27| 10216.46| 10977.03| 244955.56   |
| 5-Segment Model     | Study 1 | 0.855| 487  | 229      | 258      | 3668.64| 9886.48 | 10845.59| 234387.51   |
|                     | Study 2 | 0.756| 530  | 224      | 306      | 3369.98| 10209.53| 11166.66| 324263.73   |
| 6-Segment Model     | Study 1 | 0.872| 487  | 276      | 211      | 3577.05| 9861.44 | 11017.4 | 241750.64   |
|                     | Study 2 | 0.807| 530  | 270      | 260      | 3354.43| 10222.04| 11375.71| 262164.78   |

Abbreviations: AIC, Akaike information criterion; BIC, Bayesian information criterion; LL_ratio, loglikelihood ratio; Npar, number of parameters; resid.df, residual degrees of freedom; $\chi^2$, chi-squared.
respondents’ strong beliefs in their abilities to abide by the recommended preventative measures, and had the most positive attitude toward those measures ($M = 6.742, SD = 0.13$). Moreover, they seemed to reject the narratives that the threat of coronavirus was overstated, overblown, and exaggerated ($M = 1.594, SD = 0.17$). The average age of segment 1 respondents was $37.712 (SD = 1.45)$, with 46% females and 28% self-identified as essential workers. Close to 60% of the respondents in segment 1 (59.4%) reported a combined household income of $50,000 and above, with 28% in the high-income bracket (i.e., the combined household income was $80,000 and more), and segment 1 respondents scored an average of $2.856 (SD = 0.22)$ on political leanings, suggesting a more liberal ideology.

**Segment 2: The Dismissive**

Segment 2 was 36.55% of the sample and scored the lowest on perceived threat ($M = 4.624$ vs. $M_{\text{segment 1}} = 6.616$ vs. $M_{\text{segment 3}} = 5.788, SD = 0.13$), susceptibility ($M = 3.472$ vs. $M_{\text{segment 1}} = 4.336$ vs. $M_{\text{segment 3}} = 5.586, SD = 0.17$), and fear ($M = 2.955$ vs. $M_{\text{segment 1}} = 4.533$ vs. $M_{\text{segment 3}} = 5.3, SD = 0.22$). Segment 2 respondents did not think positively about the recommended preventive measures ($M = 5.669$ vs. $M_{\text{segment 1}} = 6.742$ vs. $M_{\text{segment 3}} = 6.013, SD = 0.13$) and reported the lowest self-efficacy ($M = 5.523$ vs. $M_{\text{segment 1}} = 6.659$ vs. $M_{\text{segment 3}} = 5.863, SD = 0.12$). Segment 2 also seemed to endorse the view that the threat and danger of coronavirus was overstated ($M = 4.309$ vs. $M_{\text{segment 1}} = 1.594$ vs. $M_{\text{segment 3}} = 5.338, SD = 0.18$) and scored higher than segment 1 on political leanings ($M = 4.371$ vs. $M_{\text{segment 1}} = 2.856, SD = 0.23$), suggesting they were less liberal and more conservative. Segment 2 respondents were slightly older compared to segment 1 ($M = 38.433, SD = 1.5$), with 31% females and 29% essential workers. More than half the respondents in segment 2 (51.7%) reported a combined annual household income of $50,000 and above, with 22% in the high-income bracket.
### TABLE 4  Summary of the validation results for study 1 and study 2

|                      | 1-Segment Model | 2-Segment Model | 3-Segment Model | 4-Segment Model | 5-Segment Model | 6-Segment Model |
|----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| **Full sample**      |                 |                 |                 |                 |                 |                 |
| Study 1              | 11146.85        | 10752.68        | 10734.69        | 10759.12        | 10845.59        | 11017.4         |
| Study 2              | 11144.86        | 10764.15        | 10788.39        | 10977.03        | 11166.66        | 11375.71        |
| Mean                 | 10604.94        | 10238.93        | 10231.82        | 10265.61        | 10359.85        | 10531.08        |
|                      |                 |                 |                 |                 |                 |                 |
| **Validation**       |                 |                 |                 |                 |                 |                 |
| Median               | 10606.69        | 10239.21        | 10230.81        | 10266.19        | 10359.59        | 10530.83        |
| Study 2              | 10611.92        | 10255.74        | 10288.39        | 10473.69        | 10663.89        | 10879.64        |

*Note*: Validation analysis was conducted by repeating the model selection procedure 500 times on subsamples randomly drawn from resampling 95% of the total sample. Abbreviation: BIC, Bayesian information criterion.
**Segment 3: The Apprehensive**

Segment 3 was the smallest at 16.43% of the sample and were the most fearful of the segments ($M = 5.3$ vs. $M_{\text{segment1}} = 4.533$ vs. $M_{\text{segment2}} = 2.955$, $SD = 0.18$). They also reported the greatest susceptibility ($M = 5.588$ vs. $M_{\text{segment1}} = 4.336$ vs. $M_{\text{segment2}} = 3.472$, $SD = 0.14$) and scored higher on perceived threat than segment 2 but lower than segment 1 ($M = 5.788$ vs. $M_{\text{segment1}} = 6.616$ vs. $M_{\text{segment2}} = 4.624$, $SD = 0.11$). They conveyed a positive attitude toward the recommended preventive measures ($M = 6.013$, $SD = 0.11$) and had high self-efficacy ($M = 5.863$, $SD = 0.1$). Interestingly, segment 3 respondents scored the highest among the three segments on attitude toward the narrative ($M = 5.338$ vs. $M_{\text{segment1}} = 1.594$ vs. $M_{\text{segment2}} = 4.309$, $SD = 0.15$), indicating their agreement with the rhetoric that the threat of the coronavirus was overstated. Segment 3 also scored the highest on the political leanings scale ($M = 5.575$ vs. $M_{\text{segment1}} = 2.856$ vs. $M_{\text{segment2}} = 4.371$, $SD = 0.19$), indicating that they were the most conservative. Segment 3 was the youngest ($M = 36.713$, $SD = 1.25$), with 38% females and 66% essential workers. More than 70% of the respondents in segment 3 (71.2%) had a combined annual household income of $50,000 and above, with 14% in the high-income bracket. Segment profiles by predictor variables and covariates are summarized in Tables 6 and 7 and depicted in Figures 4 and 5, respectively.

To summarize, in Study 1, the LCA uncovered three distinctive segments of consumers early in the onset of the pandemic: the Prepared, the Dismissive, and the Apprehensive. However, as time has progressed, segments may have shifted due to changes in outlook factors (vaccine availability and reduced uncertainty about the disease, for example). Consequently, to verify if the three-segment pattern holds after several months, we conducted a second study in March 2021 with the same instrument from Study 1, adding measures for stress, satisfaction with life, vaccine concerns, and vaccination intention. We also included a question that asked
| Predictor        | Segment 1 (Study 1/Study 2) | Segment 2 (Study 1/Study 2) | Segment 3 (Study 1) | Wald (Study 1/Study 2) | P (Study 1/Study 2) | R² (Study 1/Study 2) |
|------------------|----------------------------|----------------------------|-------------------|------------------------|-------------------|---------------------|
| Threat           | 1.495/1.527                | −1.381/−1.527              | −0.114            | 88.703/37.667          | <0.001/<0.001     | 0.423/0.497         |
| Susceptible      | 0.266/0.188                | −0.7349/−0.188             | 1.0004            | 62.942/17.667          | <0.001/<0.001     | 0.2584/0.044        |
| Self-efficacy    | 1.401/0.340                | −0.898/−0.340              | −0.503            | 81.558/42.029          | <0.001/<0.001     | 0.2755/0.128        |
| Fear             | 0.011/0.397                | −0.464/−0.397              | 0.453             | 67.989/77.885          | <0.001/<0.001     | 0.23/0.266          |
| Att_narrative    | −1.266/−0.655              | 0.4617/0.655               | 0.804             | 43.767/70.307          | <0.001/<0.001     | 0.594/0.514         |
| Att_measures     | 0.975/0.453                | −0.65/−0.453               | −0.325            | 49.414/43.742          | <0.001/<0.001     | 0.197/0.127         |
| Political leanings | −0.517/−0.514           | 0.034/0.514                | 0.483             | 79.764/71.846          | <0.001/<0.001     | 0.305/0.292         |

*Note: For Segment 3, we only reported the Wald test statistics for study 1 because Segment 3 was not applicable in study 2.*
participants to indicate their current hoarding, stockpiling, and panic buying behaviors and to reflect on these same behaviors when the pandemic was first declared.

4.3 | Study 2

530 Prolific Academic panelists (43.2% males; $M_{\text{age}} = 32.15, SD_{\text{age}} = 12.38$) participated in exchange for compensation. Because we additionally measured stress, satisfaction with life (SWL), vaccine concerns, and vaccination intention in Study 2, prior to the clustering analysis, we performed CFA. The results showed an acceptable model fit ($\chi^2 = 1290.647, df = 551, \text{RMSEA} = 0.05, \text{GFI} = 0.884, \text{CFI} = 0.966$). All constructs demonstrated reliability and convergent and discriminant validities (see Tables 1 and 8).

4.3.1 | Results from latent class model estimation for study 2

Following Study 1, we performed LCA, and a two-segment model emerged as the optimal solution (see Table 3 and Figure 2). Validation through jackknife resampling analysis also showed that the two-segment model was superior (see Table 4 and Figure 3). The Wald statistics indicated that the predictor variables were all significant at $p < 0.001$ (i.e., Table 5). The significant indicators in order of importance based on $R^2$ were attitude toward the narrative (51.42%), threat (49.69%), political leanings (29.20%), fear (26.62%), self-efficacy (12.83%), attitude toward the measures (12.68%), and susceptibility (4.4%). Segment profiles by predictor variables and covariates are summarized in Tables 6 and 7 and depicted in Figures 4 and 5, respectively.

| Segment 1: The Dedicated vs. Segment 2: The Dismissive |
|-----------------------------------------------------|
| Threat                                              |
| The Prepared/The Dedicated mean (SE) (Study 1/Study 2) | 6.616 (0.12)/6.669 (0.04) |
| The Dismissive mean (SE) (Study 1/Study 2)          | 4.624 (0.13)/4.655 (0.09) |
| The Apprehensive mean (SE) (Study 1)                | 5.7875 (0.11) |
| Susceptible                                         |
| The Prepared/The Dedicated mean (SE) (Study 1/Study 2) | 4.336 (0.16)/4.664 (0.06) |
| The Dismissive mean (SE) (Study 1/Study 2)          | 3.472 (0.17)/3.955 (0.14) |
| The Apprehensive mean (SE) (Study 1)                | 5.5875 (0.14) |
| Self-efficacy                                       |
| The Prepared/The Dedicated mean (SE) (Study 1/Study 2) | 6.659 (0.11)/6.181 (0.05) |
| The Dismissive mean (SE) (Study 1/Study 2)          | 5.523 (0.12)/5.127 (0.12) |
| The Apprehensive mean (SE) (Study 1)                | 5.8625 (0.1) |
| Fear                                                |
| The Prepared/The Dedicated mean (SE) (Study 1/Study 2) | 4.533 (0.21)/4.969 (0.07) |
| The Dismissive mean (SE) (Study 1/Study 2)          | 2.955 (0.22)/2.927 (0.16) |
| The Apprehensive mean (SE) (Study 1)                | 5.3 (0.18) |
| Att_narrative                                       |
| The Prepared/The Dedicated mean (SE) (Study 1/Study 2) | 1.594 (0.17)/1.817 (0.05) |
| The Dismissive mean (SE) (Study 1/Study 2)          | 4.309 (0.18)/5.036 (0.12) |
| The Apprehensive mean (SE) (Study 1)                | 5.3375 (0.15) |
| Att_measures                                        |
| The Prepared/The Dedicated mean (SE) (Study 1/Study 2) | 6.742 (0.13)/6.665 (0.04) |
| The Dismissive mean (SE) (Study 1/Study 2)          | 5.669 (0.13)/5.827 (0.08) |
| The Apprehensive mean (SE) (Study 1)                | 6.0125 (0.11) |
| Political leanings                                  |
| The Prepared/The Dedicated mean (SE) (Study 1/Study 2) | 2.856 (0.22)/2.536 (0.06) |
| The Dismissive mean (SE) (Study 1/Study 2)          | 4.371 (0.23)/4.546 (0.14) |
| The Apprehensive mean (SE) (Study 1)                | 5.575 (0.19) |

Note: For the Apprehensive, we only reported the means and standard deviations for study 1 because the Apprehensive segment was not applicable in study 2.
| Age            | The Prepared/The Dedicated Mean (SE) (Study 1/Study 2) | The Dismissive Mean (SE) (Study 1/Study 2) | The Apprehensive Mean (SE) (Study 1) |
|----------------|-------------------------------------------------------|-------------------------------------------|-------------------------------------|
|                | Size/Frequency                                       | Size/Frequency                            | Size/Frequency                      |
|                |                                                       |                                           |                                     |
| Gender         |                                                       |                                           |                                     |
| Female         | 106/238                                               | 55/50                                     | 30                                  |
| Male           | 123/171                                               | 123/58                                    | 50                                  |
| Other          | 0/11                                                  | 0/2                                       | 0                                   |
| Income         |                                                       |                                           |                                     |
| High ($80 K and above) | 64/111                                           | 40/33                                     | 11                                  |
| Medium (between $40 K and $79,999) | 107/156                                          | 83/37                                     | 50                                  |
| Low ($39,999 and lower) | 58/153                                           | 55/40                                     | 19                                  |
| Line of work   |                                                       |                                           |                                     |
| Nonessential   | 164/323                                               | 126/81                                    | 14                                  |
| Essential      | 65/97                                                 | 52/29                                     | 66                                  |
toward the coronavirus narratives, with the former rejecting and the latter endorsing the belief that the threat of coronavirus was overstated ($M = 1.817$, $SD = 0.05$ vs. $M = 5.037$, $SD = 0.12$). Segment 1 was younger ($M = 31.829$, $SD = 0.6$ vs. $M = 33.35$, $SD = 1.33$), with more females (57% vs. 45%) and a slightly smaller percentage of essential workers (23% vs. 26%) and had a slightly smaller percentage of respondents in the high-income bracket with a combined household income of $80,000 and more (26% vs. 30%). Segment 1 was also more liberal ($M = 2.536$, $SD = 0.06$ vs. $M = 4.546$, $SD = 0.14$).

Thus, 9 months after Study 1, consumers have modified their perceptions and beliefs about the coronavirus in a prolonged battle against the disease. These changing perceptions and beliefs have led to a shift from a three-segment model found in Study 1 to a two-segment model in Study 2, which revealed that the initial fear and uncertainty around the pandemic appears to
|        | SWL  | Threat | Susceptible | Self-efficacy | Att_narrative | Fear  | Att_measures | Int_comp | Att_comp | Int_measures | Stress | Concern_vax | Int_vax |
|--------|------|--------|-------------|---------------|---------------|-------|--------------|----------|----------|--------------|--------|-------------|---------|
| SWL    | 0.867 |        |             |               |               |       |              |          |          |               |        |             |         |
| Threat | −0.115| 0.956  |             |               |               |       |              |          |          |               |        |             |         |
| Susceptible | −0.220| 0.216  | 0.713       |               |               |       |              |          |          |               |        |             |         |
| Self-efficacy | −0.007| 0.468  | −0.115      | 0.786         |               |       |              |          |          |               |        |             |         |
| Att_narrative | 0.140| −0.697 | −0.093      | −0.467        | 0.933         |       |              |          |          |               |        |             |         |
| Fear   | −0.272| 0.561  | 0.382       | 0.266         | −0.431        | 0.940 |              |          |          |               |        |             |         |
| Att_measures | −0.022| 0.446  | 0.145       | 0.396         | −0.352        | 0.295 | 0.775        |          |          |               |        |             |         |
| Int_comp | −0.047| 0.500  | 0.123       | 0.367         | −0.539        | 0.357 | 0.390        | 0.969    |          |               |        |             |         |
| Att_comp | −0.090| 0.692  | 0.127       | 0.461         | −0.649        | 0.383 | 0.442        | 0.604    | 0.956    |               |        |             |         |
| Int_measures | −0.091| 0.815  | 0.152       | 0.657         | −0.712        | 0.504 | 0.586        | 0.620    | 0.766    | 0.830        |        |             |         |
| Stress | −0.542| 0.197  | 0.265       | 0.069         | −0.139        | 0.346 | 0.068        | 0.095    | 0.143    | 0.192        | 0.864  |             |         |
| Concern_vax | 0.012| −0.397 | 0.044       | −0.311        | 0.505         | −0.145| −0.199       | −0.261   | −0.373   | −0.398       | −0.043 | 0.857       |         |
| Int_vax | −0.084| 0.552  | 0.113       | 0.298         | −0.591        | 0.404 | 0.241        | 0.356    | 0.490    | 0.520        | 0.137  | −0.687      | 0.983  |

Note: Numbers on the diagonal are the square root of AVEs; off-diagonal numbers are inter-construct correlations.
have dissipated, with a majority of consumers continuing to operate with caution and seriousness (segment 1: the Dedicated) and a minority of consumers continuing to perceive the pandemic as an overstated threat (segment 2: the Dismissive).

### 4.4 Predicting coronavirus pandemic-related attitudes and behaviors with the identified segments in studies 1 and 2

According to the EPPM (Witte, 1992; Witte et al., 1996), when perceived threat (i.e., severity and susceptibility) and efficacy (i.e., self-efficacy and response efficacy) are both high, protection motivation will activate and subsequently lead to attitude and behavior that are conducive to adaptive changes to tackle the threat and danger. For example, Johnston and Warkentin (2010) showed that response efficacy and self-efficacy both positively impacted user intention toward adopting spyware recommendations. Similarly, Liu et al. (2016) demonstrated in an experiment in which a virus outbreak hypothetically took place on a cruise ship that self-efficacy interacted with perceived threat to influence consumers’ perceived safety and intention toward cruise travel. In the current research, the Prepared (Study 1) and the Dedicated (Study 2) are the consumer segments that held the strongest perceived threat and efficacy beliefs toward the coronavirus. Applying the EPPM and previous research findings as discussed earlier, we suspect that the Prepared/Dedicated will be motivated to engage in adaptive responses (e.g., having a positive attitude toward the preventive measures and companies that enforce the measures) and disengage in maladaptive cognitions (e.g., defensive avoidance) because these segments have taken the pandemic seriously and therefore also are likely to respond well to companies that are outwardly doing the same. They also do not experience an overwhelming fear as with the Apprehensive and thus likely do not feel a strong need to counter fear through maladaptive control strategies (e.g., panic buying/hoarding) as the Apprehensive do.

Meanwhile, those who view the threat of the coronavirus as overstated (the Dismissive of both studies) likely perceive policies and guidelines as limitations to their freedom rather than mechanisms of safety, and as such, they experience feelings of reactance that manifest in more negative perceptions of companies enforcing those rules. That is, for consumers who think that the coronavirus is not a significant health threat and/or that mitigation measures are not particularly useful, being told that they must wear masks and socially distance is, in their view, an unnecessary restriction on their preferred behavior. Thus, the Dismissive group responds negatively (i.e., with reactance) to what they perceive as an attempt to control their behavior.

Further, because attitudes and cognitions guide behavior, according to the TRA (Fishbein & Ajzen, 1975), we expect adaptive behaviors and behavioral intentions to follow in line with these attitudes and cognitions of the identified segments. Therefore, we propose:

**Hypothesis 1.** Compared to the Apprehensive and the Dismissive, the Prepared/Dedicated will exhibit (a) a more positive attitude toward companies that enforce the preventive measures, (b) greater intentions to purchase from these companies, (c) greater intentions to follow the measures, (d) less defensive avoidance, and (e) less panic buying, hoarding, and stockpiling.

Meanwhile, the EPPM posits that when high fear is coupled with low efficacy, a defensive motivation will ensue, resulting in maladaptive outcomes to control fear (Witte, 1992; Witte et al., 1996). This argument is built on perceptual defense research that demonstrates that
excessive anxiety evoked early on impedes further recognition processes at later stages (Gleitman et al., 2010). For example, Moody et al. (2018) show that fear significantly affected defensive avoidance and psychological reactance in the IT security context, including behaviors such as not sharing passwords and logging out and locking computers. In our research, the Apprehensive and the Dismissive are the consumer segments that both scored lower on efficacy beliefs than the Prepared and the Dedicated. The difference between the two is that while the Apprehensive exhibited the highest fear, the Dismissive showed the lowest fear. According to the EPPM, we suspect that the Apprehensive will be more likely to engage in maladaptive cognitions and behaviors due to the combined high threat/low efficacy they have experienced. Therefore, we propose:

**Hypothesis 2.** Compared to the Dismissive, the Apprehensive will exhibit (a) more defensive avoidance, (b) more panic buying, hoarding, and stockpiling, (c) less positive attitude toward companies that enforce the preventive measures, (d) less intentions to purchase from these companies, and (e) less intentions to follow the measures.

We performed hypothesis testing for Study 1 and Study 2 separately because the number of consumer segments changed from three in Study 1 to two in Study 2. The results are presented below.

### 4.4.1 ANOVA and post hoc comparisons

For Study 1, we conducted ANOVA and post hoc comparisons to test the hypotheses. For study 2, we performed independent samples t-tests. The results indicated significant between-segment differences on all outcome variables for Study 1: panic buying ($F = 55.233, p < 0.001$), hoarding ($F = 64.959, p < 0.001$), stocking essential products ($F = 21.602, p < 0.001$) and nonessential products ($F = 42.647, p < 0.001$), defensive avoidance ($F = 50.653, p < 0.001$), attitude toward companies ($F = 85.142, p < 0.001$), purchase intention ($F = 66.747, p < 0.001$), and intention to follow the measures ($F = 125.357, p < 0.001$).

Results from post hoc comparisons using the Bonferroni test revealed that compared to the Prepared, the Apprehensive engaged in significantly more panic buying ($M = 4.9$ vs. $2.7$, $p < 0.001$), hoarding ($M = 5.18$ vs. $2.75$, $p < 0.001$), stocking of essential ($M = 5.34$ vs. $4.15$, $p < 0.001$) and nonessential products ($M = 4.94$ vs. $2.96$, $p < 0.001$), and defensive avoidance ($M = 4.22$ vs. $2.17$, $p < 0.001$). The Apprehensive also held a significantly less positive attitude toward companies ($M = 5.65$ vs. $6.488$, $p < 0.001$), a lower purchase intention ($M = 5.663$ vs. $6.672$, $p < 0.001$), and a lower intention to follow the measures ($M = 5.658$ vs. $6.672$, $p < 0.001$). Similarly, the Dismissive displayed greater defensive avoidance ($M = 3.28$ vs. $2.17$, $p < 0.001$) and expressed a less positive attitude toward companies ($M = 4.82$ vs. $6.488$, $p < 0.001$), a lower purchase intention ($M = 5.242$ vs. $6.461$, $p < 0.001$), and a lower intention to follow the measures ($M = 5.066$ vs. $6.672$, $p < 0.001$) than the Prepared. However, the Dismissive and the Prepared did not differ significantly on panic buying, hoarding, or stocking of essential and nonessential products. Taken together, these results from Study 1 provided partial support for H1.

As H2 predicted, the Dismissive engaged in significantly less panic buying ($M = 2.77$ vs. $4.90$, $p < 0.001$), hoarding ($M = 2.90$ vs. $5.18$, $p < 0.001$), stocking of essential ($M = 3.81$ vs. $5.34$, $p < 0.001$) and nonessential products ($M = 3.20$ vs. $4.94$, $p < 0.001$), and defensive
avoidance ($M = 3.28 \text{ vs. } 4.22, p < 0.001$) than the Apprehensive. The Dismissive also had a less positive attitude toward companies ($M = 5.242 \text{ vs. } 5.663, p = 0.004$), a lower purchase intention ($M = 5.066 \text{ vs. } 5.663, p < 0.001$), and a lower intention to follow the measures ($M = 5.65 \text{ vs. } 5.663, p < 0.001$). Thus, H2 was supported in Study 1.

For Study 2, the results from independent samples t-tests revealed significant differences between the Dedicated and the Dismissive on attitude toward the companies ($M = 6.65 \text{ vs. } 4.60, t = 18.70, p < 0.001$), purchase intention ($M = 6.26 \text{ vs. } 4.35, t = 13.64, p < 0.001$), intention to follow the measures ($M = 6.53 \text{ vs. } 4.80, t = 20.05, p < 0.001$), defensive avoidance ($M = 1.79 \text{ vs. }$)

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**Table 9** Segment profiles by outcome variables for study 1 and study 2

| Outcome Variable                        | Prepared/The Dedicated (Study 1/Study 2) | Dismissive (Study 1/Study 2) | Apprehensive (Study 1) |
|----------------------------------------|----------------------------------------|-----------------------------|------------------------|
| Panic buy                              | 2.703 (0.22)/1.614 (0.05)              | 2.770 (0.23)/1.746 (0.1)    | 4.9 (0.19)             |
| Hoarding                               | 2.751 (0.22)/2.112 (0.07)              | 2.899 (0.23)/2.1 (0.15)    | 5.175 (0.19)           |
| Stock essentials                       | 4.153 (0.23)/2.867 (0.09)              | 3.815 (0.23)/2.818 (0.19)  | 5.3375 (0.19)          |
| Stock non-essentials                   | 2.961 (0.22)/2.252 (0.07)              | 3.197 (0.23)/2.327 (0.15)  | 4.9375 (0.19)          |
| Att_comp                               | 6.488 (0.17)/6.648 (0.05)              | 4.82 (0.17)/4.6 (0.11)     | 5.65 (0.14)            |
| Int_measures                           | 6.673 (0.13)/6.531 (0.04)              | 5.06 (0.14)/4.804 (0.09)   | 5.6583 (0.11)          |
| Int_companies                          | 6.461 (0.14)/6.264 (0.06)              | 5.242 (0.14)/4.355 (0.14)  | 5.6625 (0.12)          |
| Defensive avoidance                    | 2.166 (0.22)/1.793 (0.07)              | 3.281 (0.23)/2.927 (0.15)  | 4.225 (0.19)           |
| SWL\textsuperscript{a}                 | —/3.641 (0.08)                         | —/4.109 (0.17)             | —                      |
| Stress\textsuperscript{a}              | —/4.306 (0.09)                         | —/3.577 (0.19)             | —                      |
| Concern_vax\textsuperscript{a}         | —/3.112 (0.08)                         | —/4.718 (0.18)             | —                      |
| Int_vax\textsuperscript{a}             | —/6.102 (0.08)                         | —/3.685 (0.18)             | —                      |

\textsuperscript{a}Indicates variables measured in study 2 only.

**Figure 6** Segment profiles by outcome variables for study 1 and study 2
2.93, \( t = -7.73, p < 0.001 \), and stocking essential products at the beginning of the pandemic (\( M = 4.17 \) vs. \( 3.65, t = 2.583, p = 0.01 \)). These two consumer segments did not differ on their before and current behaviors of panic buying, hoarding, and stocking of nonessential product (\( p > 0.1 \)). Taken together, these results showed that the Dedicated demonstrated more positive attitude and purchase intention toward companies that enforce the preventive measures than the Dismissive. They also indicated greater intention to continue to follow the measures than the Dismissive. However, contrary to the prediction, the Dedicated reported engaging in more stockpiling of essential products at the beginning of the pandemic than the Dismissive. Therefore, \( H1 \) was partially supported in Study 2. \( H2 \) was not tested because the Apprehensive did not emerge as a customer segment in Study 2.

Because we additionally measured stress, satisfaction with life (SWL), vaccine concerns, and vaccination intention in Study 2, we examined the differences between the Dedicated and the Dismissive on these variables using independent samples t-test. The results showed that although the Dedicated experienced greater stress (\( M = 4.31 \) vs. \( 3.58, t = 3.86, p < 0.001 \)) and lower SWL (\( M = 3.64 \) vs. \( 4.11, t = -2.78, p = 0.006 \)) than the Dismissive, they expressed reduced concerns about the vaccine (\( M = 3.11 \) vs. \( 4.72, t = -8.98, p < 0.001 \)) and indicated greater intention to be vaccinated (\( M = 6.05 \) vs. \( 3.62, t = 12.98, p < 0.001 \)).

Segment profiles by outcome variables are displayed in Table 9 and depicted in Figure 6.

Finally, as a matter of interest, we compared differences in \( R^2 \) values on the predictors used to identify the segments in studies 1 and 2 (see Table 5) to determine whether the importance of each of the identified predictors shifted as the pandemic progressed. Across predictors, threat (0.423 vs. 0.497) and fear (0.230 vs. 0.266) became slightly more important later in the pandemic, whereas both susceptibility (0.258 vs. 0.044) and self-efficacy (0.276 vs. 0.128) declined considerably. It could be that as time passed, consumers developed a better sense of their own susceptibility to the virus as well as their own efficacy in dealing with the virus, and this reduction in uncertainty around these factors decreased the predictors’ ability to distinguish segments. However, the importance of how consumers have viewed the threat of the virus did not diminish, nor did consumers’ fear; thus, threat perceptions and fear continued to help considerably in identifying segments. Further, attitudes toward both the narrative (0.594 vs. 0.514) and safety measures (0.197 vs. 0.127) declined in importance, perhaps due to pandemic fatigue, increases in vaccination, and/or decreases in the implementation of measures in many locations. However, attitude toward the narrative persisted as the predictor with the highest \( R^2 \) value, so how consumers have viewed the narrative around the pandemic remained important in identifying segments. Finally, political leanings did not shift considerably in predictive value, which remained moderate relative to the other predictors (0.305 vs. 0.292).

5 | DISCUSSION

This investigation utilized latent class analysis (LCA) to first identify consumer segments and then conducted differences tests to examine the relationship between segment membership and consumers’ attitudinal and behavioral responses to the coronavirus pandemic, including companies’ actions, through the lens of the EPPM and the TRA. The results revealed three primary segments at the early stages of the pandemic: the Apprehensive, who feel particularly afraid of and susceptible to the virus and are worried about its effects, thus leading to significantly more panic buying, hoarding, and stockpiling, greater defensive avoidance, and moderately positive perceptions of companies that enforce guidelines; the Prepared, who perceive a somewhat lower
susceptibility but still take the threat of the virus seriously, respond more positively to companies enforcing guidelines, and engage in less panic buying, hoarding, stockpiling, and defensive avoidance than the Apprehensive; and the Dismissive, who downplay the threat of the virus and exhibit more negative reactions to mitigation measures and companies that enforce them.

In the second study conducted 9 months later, two segments emerged: the Dedicated, who continue to take the pandemic seriously and exhibit more favorable perceptions of both companies enforcing guidelines and the vaccine, though they report a greater level of ongoing stress and lower SWL; and the Dismissive, who continue to view the coronavirus threat as overstated and have more negative perceptions of companies enforcing guidelines as well as the vaccine. To clarify, while the Dedicated reflect similar perceptions and behaviors to the Prepared, the difference in stages in the pandemic warrants consideration of these segments using different labels (i.e., “Dedicated” refers to these consumers’ ongoing commitment to pandemic-related behaviors, whereas “Prepared” refers to an early-stage set of perceptions and behaviors reflective of entering the pandemic). Meanwhile, “Dismissive” is appropriate for both the earlier- and later-stage segments as the associated perceptions and behaviors are adequately described as dismissive regardless of stage. Several implications follow.

5.1 | Theoretical implications

This research contributes to theory in three ways. First, through empirically identifying and validating distinctive segments of consumers based on their cognitive, affective, and behavioral responses to the COVID-19 pandemic, we add to the nascent but growing literature aimed at understanding the impact of the pandemic on consumers (e.g., Cronshaw, 2021; Ekici & Watson, 2021; Jin & Ryu, 2021; Nayal et al., 2021). Second, in using segmentation variables theoretically grounded in the Extended Parallel Process Model (Witte, 1992; Witte et al., 1996) and the Theory of Reasoned Action (Fishbein & Ajzen, 1975), this research illustrates the predictive power of the EPPM and the TRA and extends both theories to the novel and evolving context of the COVID-19 pandemic. Third, this research contributes to Smith’s (1956) segmentation theory by substantiating not only the existence of heterogenous segments of consumers that differ in how they respond to the pandemic but also evidencing the dynamic shifting of three consumer segments formed at the early stage of the pandemic (study 1) to two consumer segments persisted 9 months after (study 2). Consequently, this research offers insights into consumer segments as well as the changes of the segments (both composition and proportion within the broader US population) based on consumers’ perceptions of threat and strategies for addressing the threat at both earlier and later stages of a health crisis.

5.2 | Managerial implications

Our research results highlight the strategic importance of market segments as advocated in Smith (1956). As such, in line with Smith (1956), marketers can have a better understanding of how consumers are likely to respond to future health crises and can adapt strategies accordingly. Meanwhile, as the current pandemic continues, marketers can understand how consumer perceptions, attitudes, and behaviors have shifted overall and can utilize this information as companies continue to adapt to the amorphous nature of the pandemic. More specifically, several important implications follow.
In the early stages of the pandemic, nearly two-thirds of the sample fell into one of two groups that have taken the pandemic seriously: the Apprehensive and the Prepared. These two segments combined likely constitute most consumers. Although both the Apprehensive and the Prepared complied with guidelines and view companies positively when guidelines are put into place and enforced, they take different routes in dealing with the threat of the virus. While the Prepared activated the protection motivation to control the danger of the virus, the Apprehensive resorted to the defensive motivation and engaged in maladaptive behaviors, including panic buying, hoarding, stockpiling, and defensive avoidance, to cope with the strong feelings of fear toward the virus. The well-being of the Apprehensive seems to have deteriorated the most among all three segments: their fear of the virus coupled with maladaptive behaviors is indicative of the worsening of their well-being.

In the later stages of the pandemic, however, this initial fear appears to have largely dissipated, so marketers should be prepared in future crises for initial maladaptive responses that then diminish as uncertainty is reduced. That is, marketers can be logistically prepared for initial rushes to engage in panic buying/hoarding when a crisis first occurs but need not necessarily brace for months-long inventory issues as this maladaptive strategy has not persisted over the current life of the pandemic. Meanwhile, the adaptive approach of the Prepared led these consumers not to engage in panic buying, hoarding, or stockpiling as those behaviors would likely be deemed as overreactions or knee-jerk responses by this segment. In this way, the Prepared and Dismissive have exhibited similar levels of panic buying, hoarding, and stockpiling, but whereas the Dismissive did not engage in those behaviors because they believed that the pandemic has been an overhyped hoax, the Prepared simply deemed those behaviors as unnecessary, if not unproductive, in dealing with the threat of the pandemic.

Further, in Study 2, almost 80% of the sample aligned with the Dedicated segment, indicating that as the pandemic progressed, more consumers seemed to gravitate toward taking the pandemic seriously. However, the remaining fifth of the sample aligned with the Dismissive segment, so a non-trivial proportion of consumers continue to view the pandemic as an overstated threat and continue to respond negatively to guidelines and measures and the companies that enforce them. Thus, marketers can be prepared for this segment for both the remaining duration of the current pandemic and for future health crises by anticipating a notable, if not significant, percentage of consumers who respond to mitigation measures with reactance because they do not take the accompanying threat seriously.

Moreover, the proportionally higher representation of essential workers in the Apprehensive segment of Study 1 may suggest that essential workers are at an even higher risk of a diminishing well-being. In the early stages of a health crisis, this group may have perceived a greater chance of contracting the virus through their jobs as essential workers. Thus, when a crisis first emerges, they may feel a stronger need to build personal stockpiles and buy more products just in case of the need to isolate themselves due to a positive test or exposure to the virus. Therefore, marketers with target markets composed of many essential workers or retailers with locations near essential worker points of congregation (i.e., close to large hospitals) should react quickly with additional backup inventory when a long-term crisis begins. Simultaneously, in these early stages, marketers may wish to use messaging tactics that attempt to assuage fears in the attempt to reduce panic buying and/or may impose purchase limits on essential products.

While raising prices in an attempt to curb demand may be considered unethical (if not illegal) and thus would be unlikely to be strategically successful overall, a fear-reducing communications strategy could help to reduce high surges in demand from panicky shoppers.
Additionally, while it may seem from media that many consumers respond negatively to guidelines, the data suggest that the percentage of consumers who do so has declined as the pandemic has progressed: about 20% were identified as belonging to the Dismissive segment in Study 2, down from over 36% in Study 1. Of course, the proportion of Dismissive consumers is likely to vary widely from one region to the next, but overall, it appears that more consumers are likely to view mitigation measures positively. This is good news for marketers of companies who continue to enforce guidelines, though marketers should also be prepared for some customers to respond negatively. This finding also indicates that for future health crises, the segment of consumers who feel that the crises are overblown and that mitigation measures are an overreach will dwindle in proportion as crises enter their later stages, so marketers should be more prepared for Dismissive-aligned customers in earlier stages of a health crisis.

Further, the Prepared and Dedicated segments tended to be more liberal than the Apprehensive or Dismissive segments. Thus, regions with many liberal-identifying consumers may respond more in line with the Prepared/Dedicated segment than the other two segments. For example, while these consumers will likely respond positively toward companies that enforce guidelines, including higher patronage intentions, in the early stages of a health crisis, they may not engage in panic buying or stockpiling as much as the Apprehensive segment. Thus, retailers need not necessarily rush to increase inventory levels substantially because doing so would lead to reduced inventory turnover and, by extension, profitability, especially for retailers relying on high turnover (i.e., discounters, supermarkets). Further, communications related to the threats of a pandemic in those regions may be better received, whereas in areas with more Dismissive consumers, communications would need to be tailored to attempt to overcome resistance to pandemic-related guidelines such as social distancing and mask wearing.

Moreover, the Apprehensive and the Dismissive segments are both more conservative, which makes political ideology less useful in distinguishing the two segments early on in a health crisis. However, compared to the Dismissive, the Apprehensive are generally younger and represent more essential workers, so these identifying characteristics can be used to identify who might be likely to engage in maladaptive fear control strategies in a future health crisis, especially earlier in the stages of the crisis. Marketers may wish to adopt messaging tactics that attempt to reduce these consumers’ fears and may even present offerings that trigger positive feelings, such as special pricing or promotional events for essential workers.

The findings also show that, while most consumers do not harbor strong negative feelings toward companies that enforce guidelines—especially in later stages of the pandemic—the Dismissive segment responds negatively to companies that do so. Thus, consumers who align with the Dismissive group may reduce long-term patronage intentions toward companies that strictly enforce guidelines or emphasize the threats of health crises in the future. Certainly, short-term outcomes such as attitudes and immediate patronage during the pandemic have been lower for Dismissive consumers toward companies that enforce guidelines. Marketers whose target markets are largely composed of the Dismissive segment should therefore determine how to handle the enforcement of guidelines and the safety of front-line employees while also not alienating their customer bases in the event of future health crises. These companies may also decide to avoid adopting messaging that acknowledges pandemic-related themes.

Further, based on the shifting $R^2$ values from study 1 to study 2, marketers should reconsider the viability of the one-size-fits-all approach. Namely, marketers should be cognizant of how segmentation criteria may change across the life of a prolonged crisis and devise marketing strategies to align with the segments accordingly as discussed above. Based on the findings of this investigation, earlier in a crisis, consumers’ perceptions of their own susceptibility and self-
efficacy appear to be more important, whereas these factors diminish in importance as consumers gain more understanding of the crisis. Additionally, threat, fear, and attitude toward the narrative around a crisis as well as consumer political leanings may be strong persistent predictors of consumer segments throughout the crisis.

5.3 Public policy implications

Policymakers and consumer advocacy groups can utilize the findings in a few ways. First, policymakers must, above all, keep the public health in mind. Thus, safety measures and mandates, when scientifically supported and warranted for the protection of health and safety, are likely to be implemented despite the Dismissive segment’s negative responses. In these cases, policymakers and public health officials should adopt a stronger messaging strategy to attempt to overcome the skepticism and other negative responses of the Dismissive segment while also reassuring the Apprehensive that protection measures are worthwhile and will keep consumers safer in the marketplace. Similarly, consumer advocacy groups would seek to promote the health and well-being of consumers in the midst of pandemics, so these advocacy groups may work to highlight the fears of the Apprehensive and also determine how to meet the needs of the Dismissive segment without jeopardizing public health.

Moreover, our finding that the Dedicated expressed greater stress and lower life satisfaction speaks to the importance of attending to consumers’ mental health and psychological wellbeing during crises. Policymakers, public health officials, and consumer advocacy groups could work together to address this issue through initiating policy changes that enable accessible and affordable counseling, intervention, and medical treatment. For example, telehealth services have become an indispensable platform during the pandemic that allows patients to receive both physical medical care as well as mental health services from home. Improving the technology, policies, and infrastructure for digital health care services such as telehealth could help alleviate consumer health concerns during unexpected crisis situations in the future.

Table 10 summarizes each segment’s perceptions and behaviors toward the COVID-19 pandemic and the corresponding managerial and public policy implications.

5.4 Limitations and future research

While this work has identified consumer segments based on perceptions of the coronavirus pandemic and responses toward companies that enforce guidelines related to the pandemic, the findings offer only a first step in segmenting consumers. We included what we perceived to be among the most important variables based on the EPPM, such as perceived threat, and linked consumer responses to the segmentation criteria to offer greater insights into how marketers should approach pandemic-related strategies and messaging. However, other important influences remain to be investigated in future studies which may not be accounted within the main EPPM. For example, as time progresses, isolation wear-out is increasing, leading some consumers to downgrade their threat perceptions or even throw caution aside altogether. Further, mental health at a societal level has been declining, as have job prospects and consumer confidence. These factors could help further delineate consumer segments and reveal important moderators to the EPPM. Because we collected survey data, future research could conduct
| Segment         | COVID-19 pandemic perceptions/behavior                                                                 | Implications for marketers/policymakers                                                                                                                                                                                                 |
|-----------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Prepared/   | • Perceive COVID-19 as a serious health threat                                                         | • Rushing to substantially increase inventory levels in the early stage of a pandemic crisis may not be necessary because consumers in these segments will be less likely to engage in panic buying and hoarding.   |
| Dedicated       | • Feel moderately susceptible to COVID-19                                                              | • Messaging related to the threats of a pandemic will be better received by these consumers.                                                                                                                                               |
|                 | • Feel moderately fearful of the effects of COVID-19                                                   | • Policymakers, public health officials, and consumer advocacy groups should work to help improve the mental health and wellbeing for consumers in these consumer segments.                               |
|                 | • Strongly believe in one’s ability to follow health guidelines                                        |                                                                                                                                                                                                                                        |
|                 | • Disavow the view that the threat of COVID-19 is overstated                                           |                                                                                                                                                                                                                                        |
|                 | • Express positive attitude toward health guidelines                                                    |                                                                                                                                                                                                                                        |
|                 | • Engage the least in panic buying and hoarding                                                        |                                                                                                                                                                                                                                        |
|                 | • Express positive attitude toward companies enforcing health guidelines                               |                                                                                                                                                                                                                                        |
|                 | • Express greater purchase intentions toward companies enforcing health guidelines                   |                                                                                                                                                                                                                                        |
|                 | • Express greater intentions to follow health guidelines                                               |                                                                                                                                                                                                                                        |
|                 | • Deteriorating wellbeing due to high stress and low life satisfaction                                 |                                                                                                                                                                                                                                        |
|                 | • Low defensive avoidance                                                                              |                                                                                                                                                                                                                                        |
| The Dismissive  | • Downplay the threat of the COVID-19 health crisis                                                    | • Consumers in this segment may not engage in panic buying or hoarding because they downplay the health threat. Consequently, marketers need not necessarily rush to increase inventory levels substantially. |
|                 | • Feel the least susceptible to COVID-19                                                              | • Marketers may decide to avoid adopting messaging that acknowledges pandemic-related themes due to these consumers’ reactance to guidelines and mitigation measures.                                                |
|                 | • Feel the least fearful of the effects of COVID-19                                                    | • Policymakers and public health officials should work to overcome the skepticism and other negative responses of the Dismissive segment.                                                                                                     |
|                 | • Believe in one’s ability to follow health guidelines                                                 |                                                                                                                                                                                                                                        |
|                 | • Endorse the view that the threat of COVID-19 is overstated                                           |                                                                                                                                                                                                                                        |
|                 | • Express the least positive attitude toward health guidelines                                         |                                                                                                                                                                                                                                        |
|                 | • Engage little in panic buying and hoarding and to a similar extent as the Prepared/Dedicated        |                                                                                                                                                                                                                                        |
|                 | • Express the least positive attitude toward companies enforcing health guidelines                    |                                                                                                                                                                                                                                        |
|                 | • Express the lowest purchase intentions toward companies enforcing health guidelines                 |                                                                                                                                                                                                                                        |
|                 | • Express the lowest intentions to follow health guidelines                                            |                                                                                                                                                                                                                                        |
|                 | • Moderately high defensive avoidance                                                                  |                                                                                                                                                                                                                                        |
experiments to identify psychological mechanisms that underlie the danger control process and the fear control process to help design interventions to reduce maladaptive outcomes.

Additionally, this study utilized samples of MTurk and Prolific Academic respondents from the United States. As such, two limitations arise: (a) the samples were both taken online, and (b) we did not investigate cross-cultural differences in the pandemic response. Regarding the former limitation, future research may utilize offline samples once in-person recruitment is more feasible. As for the latter limitation, anecdotally, there may be less variation in other countries, as news reporting and social media have revealed worldwide incredulity at the number of United States residents who deny the seriousness of the pandemic and the need to engage in mitigation behaviors such as mask-wearing. However, an empirical study would provide quantitative insight into how consumer segments might look in other countries.

It is also important to acknowledge that while the sampling frames were similar for both studies, the two studies do represent separate samples, so we were not able to directly assess longitudinal changes to perceptions; rather, we inferred perceptual changes based on the differences in pandemic stages at the times of data collection. Thus, future investigations of other long-term crises could track perceptual changes within the same sample with a longitudinal design. Likewise, the measures for panic buying and similar behaviors may have been prone to

| Segment           | COVID-19 pandemic perceptions/behavior                                                                                                                                                                                                                                                                                                                                                     | Implications for marketers/policymakers                                                                                                                                                                                                                                                                                                                                                     |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Apprehensive  | • Perceive COVID-19 as a serious health threat  
• Feel the most susceptible to COVID-19  
• Feel the most fearful of the effects of COVID-19  
• Believe in one’s ability to follow health guidelines  
• Strongly endorse the view that the health threat is overstated  
• Express positive attitude toward health guidelines  
• Engage the most in panic buying and hoarding  
• Express positive attitude toward companies enforcing health guidelines  
• Express greater purchase intentions toward companies enforcing health guidelines  
• Express greater intentions to follow health guidelines  
• High defensive avoidance                                                                                                                                                                                                                                                                                                      | • Marketers can be logistically prepared for this consumer segment’s initial rushes to engage in panic buying and hoarding when a crisis first occurs but need not necessarily brace for months-long inventory issues as this maladaptive strategy has not persisted over the current life of the pandemic.  
• Marketers may consider adopting messaging tactics that attempt to reduce these consumers’ fears.  
• Marketers may also consider impose purchase limits on essential products to reduce high surges in demand from panicky shoppers.  
• Policymakers, public health officials, and consumer advocacy groups should work to highlight the fears of the Apprehensive while also reassuring these consumers that protection measures are worthwhile and will keep them safer in the marketplace to prevent maladaptive behaviors resulting from high defensive avoidance. |

Table 10 (Continued)
social desirability bias, so future research could use observation of actual behavior to counter this limitation. Finally, given that we utilized survey methods, we cannot draw conclusions about causal linkages. Thus, future research could employ experimental methods to examine causal pathways more closely. In this vein, researchers could determine whether pandemic-related perceptions directly affect both attitudes and behavioral responses or whether attitudes in such cases precede behaviors.

6 | CONCLUSION

Through two studies conducted 9 months apart, we have revealed consumer segments during earlier and later stages of the COVID-19 pandemic. While three segments emerged earlier in the pandemic (the Prepared, the Apprehensive, and the Dismissive) due to greater uncertainty and fear, the two segments that remained later in the pandemic (the Dedicated and the Dismissive) illustrate that even when initial uncertainty dissipates, consumers can remain sharply divided in their perceptions of and responses to a major health crisis such as COVID-19. Thus, marketers should approach crises such as COVID-19 with the understanding that different consumer segments may exist due to perceptual and attitudinal differences, which may lead to more efficient and effective strategies when tailored according to how target markets align with crisis-related market segments.

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