Don't be a hamster! Social appeals to curb panic buying at the point-of-sale☆

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ABSTRACT

The COVID-19 pandemic confronted retailers with an unprecedented challenge: convincing customers to buy less. Given the ineffectiveness of real-life strategies against panic buying, we explore the power of social appeals to convince consumers of buying less voluntarily. In three multi-method studies based on field and lab data, we demonstrate that the use of social appeals not only comes with favorable marketing outcomes for retailers (i.e., loyalty and attitudes), but that adequately designed social appeals are also a promising instrument to curb undesirable consumer behaviors such as panic buying in a health crisis.

1. Introduction

Everyone for themselves. Popular belief holds that relying on people's social behavior in crises is a losing battle (Zaki, 2020). The outbreak of the COVID-19 pandemic seemed to confirm these conceptions. Whenever countries reported first cases of the disease or imposed movement restrictions (Pantano et al., 2020), supermarkets suddenly faced unprecedented demand for storable products such as pasta or non-food necessities such as toilet paper (O'Connell et al., 2021).

Panic buying is a phenomenon that repeatedly accompanies natural disasters (e.g., hurricanes or floods; Kulemeka, 2010; Yuen et al., 2020) or manmade crisis events (e.g., the oil crisis or wars; McKinnon et al., 1985; Hielscher, 2022), which is why finding ways to prevent it is a pressing challenge. However, the behavior does not originate from all consumers emptying supermarket shelves at once. Instead, prior work suggests that bulk purchases of a few particularly anxious consumers lead to stock-outs that trigger herding mentality among many others (Taylor, 2021; Yuen et al., 2022).

The notion that panic buying is initially not a prevalent consumer reaction aligns well with evidence from prior crises that people rather show extraordinarily social behaviors in such times (Kulemeka, 2010;

Zaki, 2020). Yet, when designing communication strategies to contain panic buying during the COVID-19 outbreak, only few retailers relied on consumers' willingness to help others. Most of them simply reassured customers of sustained supply or adopted harsh measures such as purchasing quotas (O'Connell et al., 2021). Expanding upon this observation, we argue that social appeals (which build on people's voluntary compliance with a socially desirable behavior) are an underestimated communication strategy for retailers to contain undesirable behaviors that will likely recur in future crises (Rudert and Janke, 2022).

With its focus on retailers as social marketers, our work bridges social and retail marketing. Previous research in retail marketing research has extensively investigated how scarcity cues (e.g., the time- or quantity-restricted sales of products) improve a product's market performance (Shi et al., 2020). However, when attempting to curb panic buying, retailers find themselves in the unprecedented role of social marketers that try to sell less for the greater social good. Unlike traditional social marketers that focus on the social good (Truong, 2014), retailers will be equally concerned about how social appeals change customers' evaluation of them and their intention to continue shopping with them. Customers' attitudes and loyalty intentions toward retailers are therefore two distinct but important marketing outcomes of social

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appeals. Although consumers value social efforts of a commercial marketer when they contribute to a social issue by purchasing a product (Coleman et al., 2020), reactance theory strongly suggests that they may feel restricted in their freedom when social appeals ask them to renounce a purchase for a good cause (Brehm and Brehm, 1981). Thus, we aim to clarify whether retailers benefit from using social appeals and pose the following research question (RQ):

RQ1: How do social appeals affect customer attitudes and loyalty intentions toward retailers that use the appeals?

From a social marketing perspective, the core question is whether retailers can effectively use social appeals to curb panic buying. This likely hinges on the persuasion mechanism of the appeal and its suitability in a particular context (White and Simpson, 2013). Social marketing literature distinguishes between different types of social appeals: Certain appeals aim to evoke recipients' willingness to adopt the socially desirable or refrain from the undesirable behavior by illustrating salient norms of right or wrong behavior, while other appeals merely present the desirable behavior as most appropriate in an unclear situation (Brennan and Binney, 2010; Kavvouris et al., 2020; Rudert and Janke, 2022; White and Simpson, 2013; Zheng et al., 2023). *A priori*, it is unclear which – if any – social appeal type is most effective to curb panic buying in a crisis. Therefore, we pose:

RQ2: Which – if any – social appeal types effectively curb panic buying?

In this vein, the observation that retailers predominantly relied on communication strategies other than social appeals during COVID-19-induced panic buying may have originated from the anticipation of their ineffectiveness. However, it is unclear if they could predict it. Prior work suggests that many attempts to promote socially desirable behaviors fail because social marketers believe in the effectiveness of certain communication strategies without proof of their effectiveness (Cook et al., 2020). Social appeals are a well-established strategy to promote public health or sustainable lifestyles but have rarely been used in contexts outside these domains (Truong, 2014). Thus, retailers that have arguably little experience as social marketers (Anderson et al., 2022) may just neglect social appeals as an appropriate communication strategy when they have to react fast to contain panic buying in a crisis. We thus pose:

RQ3: Why did retailers rarely adopt social appeals to contain panic buying?

Taken together, this work contributes to social and retail marketing literature in three ways. First, we emphasize that in a setting where commercial marketers use social appeals, commercial interests are at stake. The questions that we raise reflect an important field of tension between different stakeholders in a crisis: What if social appeals are beneficial for society, but harmful to retailers that use them? By integrating how consumers respond to social appeals in terms of loyalty and attitudes, we study implications of social appeals that are academically novel but ultimately most relevant for retailers that use them. Second, we assess the effectiveness of social appeals to prevent an undesirable crisis behavior (i.e., panic buying) when and where consumers are most tempted to disregard the socially desirable behavior (i.e., at the point-of-sale). Eventually, we bridge theory and practice by considering retailers' unfamiliarity with social appeals as a key determinant for their reluctance to use social appeals to contain panic buying during the COVID-19 outbreak.

Overall, the cornerstone of this work is its emphasis on social appeals as a potential communication strategy for decision makers of different kinds who need to promote a socially-desirable behavior. Our work has immediate managerial implications for retailers that use social appeals

in crises but may also help policy makers implementing communication strategies that benefit society as a whole.

2. Theoretical background

In the following, we will first differentiate between scarcity as a marketing instrument and scarcity as a crisis phenomenon to explain why panic buying is detrimental to a retailer's commercial interests. Second, we introduce social appeals as a potential means to prevent panic buying while emphasizing the similarities and differences between social appeals and cause-related retail marketing. We embed these considerations in the psychological theory of reactance (Brehm and Brehm, 1981), which suggests that persuasion attempts (of any sort) are ineffective when recipients perceive them as a threat to the freedom to act as they please (Dillard and Shen, 2005). With a focus on threats to consumers' freedoms in a crisis, we finally hypothesize which specific types of social appeals are most likely to be effective in such times and how their effectiveness relates to changes in marketing outcomes for retailers that use social appeals.

2.1. Scarcity in marketing and social appeals to prevent panic buying

We will first review the concept of scarcity in marketing: Low availability of products generally deteriorates customer attitudes and loyalty (Helm et al., 2013). However, while intentional scarcity (e.g., limited editions) can improve a product's market performance (Shi et al., 2020), due to the low margins on essential goods such as toilet paper (Kouvelis, 2022), there is little commercial benefit in panic buying during crises. The behavior thus represents a social problem that also runs counter to a retailer's core interests. In this regard, we reason that any extraordinary communication on an empty shelf underscores the abnormality of the situation (Kirk and Rifkin, 2020; Rudert and Janke, 2022) and implies that stock-outs were beyond the retailer's control. Although such an effect may apply to measures such as purchasing quotas as well, only social appeals offer retailers the connotation that they assume social responsibility.

Social appeals are communication strategies designed to encourage individuals to voluntarily adopt socially desirable behaviors by linking benefits of the socially desirable behavior with benefits for recipients (Anderson et al., 2022; Brennan and Binney, 2010; Van Bavel et al., 2020). Social appeals thus strive to build on people's sense of social responsibility, prompting them to act in ways that benefit others, a larger community or society as a whole. While wider definitions include prohibition (Rudert and Janke, 2022) or explicit self-benefit appeals (e. g., cost savings from behavior change; White and Simpson, 2013), we exclusively conceptualize social appeals as persuasion attempts that emphasize the social value of voluntary behavior change. Thus, in contrast to restrictions such as purchasing quotas, recipients of social appeals remain in charge of the decision to comply with them or not.

Social appeals are a particularly established strategy to promote sustainable lifestyles in normal times (e.g., Goldstein et al., 2008; Kavvouris et al., 2020; White and Simpson, 2013; Zheng et al., 2023). Yet, the effects of social appeals when retailers use them to promote socially desirable behaviors in emergency contexts are unclear. Research in cause-related marketing, where commercial marketers promise to donate a certain share of revenues to charity, suggests that consumers value such efforts, particularly if they consider the retailers' motive as altruistic (Coleman et al., 2020). In line with this reasoning, we assume that social appeals generally improve customer attitudes toward a retailer, especially as asking for fewer purchases leaves little room for suspecting non-social goals of the retailer.

Nevertheless, there is an important distinction between social appeals intended to curb panic buying and cause-related marketing. Cause-related marketing encourages a purchase that contributes to a social issue, but social appeals to prevent panic buying urge customers to renounce a purchase for a good cause (Pantano et al., 2020). Even

though they center on voluntary behavior change, social appeals can thus restrict recipients' perceived freedom, and if the restriction is perceived as excessive or unjustified, recipients will likely exhibit negative affective reactions (Dillard and Shen, 2005) and disregard the social appeal (Nowak et al., 2003).

Psychological reactance theory suggests that individuals, when faced with threats to their freedom, experience psychological reactance, a psychological state that drives them to restore their sense of freedom (Brehm and Brehm, 1981). Thus, whether recipients consider an appeal as justified or not will depend on its persuasive versus coercive character (Melnyk et al., 2022).

2.2. Different types of social appeals and their presumed effects on panic buying intentions and marketing outcomes

In the following, we will introduce different types of social appeals and elaborate on their presumed effects on panic buying intentions and marketing outcomes. While all social appeals commonly illustrate a socially desirable behavior as normative such that adopting it promises higher social acceptance to recipients (White and Simpson, 2013), their communication can center on either a *descriptive* (i.e., presenting the behavior of others) or *injunctive* (i.e., emphasizing what others consider right or wrong behavior) norm (Kavvouris et al., 2020; Rudert and Janke, 2022; White and Simpson, 2013; Zheng et al., 2023). Descriptive appeals neutrally frame the socially desirable as the dominant behavior (White and Simpson, 2013), while positive (vs. negative) injunctive appeals highlight the social value (vs. cost) of the desirable (vs. undesirable) behavior (Brennan and Binney, 2010; Kavvouris et al., 2020).

That is, the distinction between positive and negative injunctive appeals pertains to their communication focus. Positive injunctive appeals highlight the social value of adopting the socially desirable behavior, while negative injunctive appeals emphasize the social cost of continuing with the undesirable behavior. Unlike injunctive appeals, descriptive appeals refrain from an explicit social judgment (Kavvouris et al., 2020), but communicate the socially desirable behavior as the dominant behavior of most people in a novel situation (Goldstein et al., 2008; Van Bavel et al., 2020).

While prior work provides examples for the effectiveness of all appeal types (Kavvouris et al., 2020), the effectiveness of either type hinges on the particular context to which it is applied (White and Simpson, 2013; Zheng et al., 2023). As elaborated above, panic buying results from a few initial consumers who make bulk purchases, whereupon many other consumers imitate the behavior when confronted with empty shelves on their shopping trip (Taylor, 2021). These drivers of panic buying are inherently tied to typical characteristics of crises. Crises represent a threat to people's daily lives and are marked by high levels of uncertainty especially at the beginning (Kim et al., 2020), which both leads consumers to perceive a loss of control (Islam et al., 2021; Kim et al., 2020; Kirk and Rifkin, 2020). Reactance theory explains why some consumers aim to regain control by doing something (i. e., buying more than usual), while others are susceptible to cues how to best cope with the uncertain situation and thus imitate bulk purchases of others (Yuen et al., 2020, 2022).

As *positive injunctive* appeals highlight the value of adopting the socially desirable behavior, they still promise to do something extraordinary in the face of an extraordinary situation but suggest helping others rather than oneself. Contrary to popular belief, prior crisis research suggests that the request to do so hits fertile ground in emergency contexts as people generally show more rather than less social behaviors in such times (Helsloot and Ruitenberg, 2004; Kulemeka, 2010; Zaki, 2020). Similarly, *descriptive appeals* are particularly effective in situations that are novel and unclear (Goldstein et al., 2008; White and Simpson, 2013). A global health crisis such as the COVID-19 pandemic has undisputedly been novel to most consumers (Islam et al., 2021; Rudert and Janke, 2022), which is why illustrating the behavior of most people as a reference can provide a behavioral guideline that removes

part of the uncertainty (Gelfand and Harrington, 2015) associated with the crisis.

In contrast, a *negative injunctive appeal* highlights the social cost of the undesirable behavior and only conversely suggests the socially desirable behavior as an alternative way of action. With the emphasis on not doing the wrong thing (instead of doing the right thing), such communication is not only cognitively more challenging (Taylor, 2021), but also means that compliant recipients primarily try to avoid discomfort associated with the undesirable behavior (Brennan and Binney, 2010) rather than gaining social approval by adopting the socially desirable behavior. Essentially, a negative injunctive appeal therefore implies a threat of social disapproval in a time when recipients already feel threatened by the crisis, which rather imposes a psychological state of reactance.

In conclusion, considering that recipients' affective reactions to social appeals are inherently tied to their willingness to comply with them (Dillard and Shen, 2005; Nowak et al., 2003) implies that retailers will likely benefit from using either positive injunctive or descriptive appeals, but that there is little benefit in using negative injunctive appeals. Taken together, we propose the following hypothesis regarding RQ1:

H1. *Using (vs. not using) a social appeal will result in more (vs. less) favorable marketing outcomes for retailers (i.e., loyalty intentions and customer attitudes) unless they use negative injunctive appeals.*

When contrasting the underlying dynamics of panic buying with the persuasion mechanisms of the different appeal types, we further argue that only positive injunctive appeals and descriptive appeals have the potential to contain undesirable behaviors such as panic buying in crises, while we reason that negative injunctive appeals likely yield counterproductive results in such times. Regarding RQ2, we therefore propose:

H2a. *Using (vs. not using) a positive injunctive social appeal that asks recipients to refrain from panic buying to help others will lead to lower (vs. higher) panic buying intentions.*

H2b. *Using (vs. not using) a descriptive social appeal portraying a dominant reference group that refrains from panic buying will lead to lower (vs. higher) panic buying intentions.*

H2c. *Using (vs. not using) a negative injunctive social appeal that links panic buying to a threat to recipients' social acceptance will lead to higher (vs. lower) panic buying intentions.*

2.3. Retailers' familiarity with social appeals

Eventually, we need to consider why retailers were reluctant to adopt social appeals. While favorable effects of adequately designed social appeals on marketing outcomes and panic buying are theoretically plausible, practitioners' approaches to designing communication strategies in reality often differ from theoretical reasoning, especially in crises (Levit and Cismaru, 2020; Rundle-Thiele et al., 2019). We also observe such a discrepancy between our appraisal of social appeals and retailers' response to panic buying during the outbreak of the COVID-19 pandemic.

In a systematic analysis of customer notices that retailers posted on empty shelves (see Supplemental Study; Web Appendix A) during this time, we generally identify three different communication strategies: restrictions, information, and/or social appeals (cf. Web Appendix A; Table A1). Corroborating recent work (O'Connell et al., 2021), restrictive strategies such as purchasing quotas were among the most prevalent strategies, while a similar share of customer notices represented informational strategies typically reassuring customers that shelves would be replenished soon. Social appeals, however, accounted for by far the smallest share of all real-world strategies (cf. Web Appendix A, Table A2).

Promoting socially desirable behaviors is a complex task (Cook et al., 2020; Rundle-Thiele et al., 2019), because certain strategies may change

the behavior of a target group in a given situation but prove ineffective for another group or situation (Casais and Proença, 2022; Gantiva et al., 2021; Zheng et al., 2023). Prior work suggests that ineffective social marketing campaigns are often subject to common mistakes, which particularly include social marketers' reliance on their preconceptions about effective strategies, inadequate research, or an ad hoc approach to designing their strategies (Cook et al., 2020). In a context such as the COVID-19 pandemic where retailers had to take immediate action, many of these mistakes were bound to occur: Retailers had little time to react and were arguably unprepared to deploy social marketing strategies (Anderson et al., 2022), which both implies potentially inadequate research on effective social marketing strategies and an ad hoc approach based on preconceptions (Truong, 2014) about the best way to contain panic buying.

Therefore, there are two possible answers why retailers barely used social appeals in times of crises (cf. RQ3): Either retailers found that alternative strategies were more effective, or they assumed social appeals to be ineffective. However, the former is unlikely the case: Since panic buying escalates because of thoughtless herding behavior (Yuen et al., 2020), the appropriateness of an informational strategy is questionable, especially as consumers who panic buy impulsively when confronted with empty shelves will hardly process information (Islam et al., 2021) that lack a clear recommendation for action (Oxman et al., 2022). Recent research further suggests that retailers' most prevalent strategy – purchasing quotas – fails to achieve its goal (O'Connell et al., 2021; Prentice et al., 2021). If enforced strictly, consumers will have to comply at a particular store, but as with any persuasive attempt that is overly prescriptive (Kavvouris et al., 2020), consumers likely experience psychological reactance and counter the restriction of their freedom by shopping several times or at several stores (Helm et al., 2013; Herjanto et al., 2021). In a crisis, which poses a threat to their freedom per se (Kirk and Rifkin, 2020), sustained behavior change (i.e., consumers who refrain from panic buying irrespective of the store) can thus only result from persuasive attempts that convince (instead of: force) consumers to change their behavior without compromising their sense of freedom and control (Nowak et al., 2003).

Given that social appeals build on the voluntary adoption of the socially desirable behavior (Brennan and Binney, 2010; Jones et al., 2010; Rudert and Janke, 2022), this line of reasoning further substantiates the assumption that they are a particularly promising means to contain undesirable behaviors such as panic buying in crises. The most plausible explanation for practitioners' reluctance to use them is therefore the second possible answer to RQ3, meaning that retailers simply assumed social appeals to be ineffective due to low familiarity with social communication strategies in an unprecedented health crisis (Anderson et al., 2022).

Therefore, we reason that the discrepancy between the proposed effects of social appeals and retailers' actual communication strategies in response to panic buying during the COVID-19 pandemic does not originate from the superiority of alternative communication strategies, but rather from retailers' preconceptions about the effectiveness of social appeals. If this reasoning holds, confidence in the effectiveness of social appeals will increase with a retailer's familiarity with using them. We propose:

H3. *Retailers that are familiar (vs. unfamiliar) with using social appeals consider them more (vs. less) effective to curb panic buying.*

3. Empirical studies

We examine the implications of using social appeals as a retailer and their effects on panic buying intentions from three different angles to ensure both the internal and external validity of the findings. First, we use quasi-experimental field data (Study 1) and analyze customers' affective reactions to socially (vs. non-socially) motivated restrictions (i.e., H1) that retailers announced on Twitter (today: X) amid the early days

of the COVID-19 pandemic. Second, we test the effectiveness of the different appeal types to curb panic buying (i.e., H2a-H2c) and their effects on customer attitudes toward retailers that use them (i.e., H1) in a web-based experiment among consumers (Study 2). Finally, we mirror Study 2 in a study among frontline retail workers who were dealing with panic buying during the COVID-19 outbreak (Study 3) and additionally examine whether familiarity with social appeals drives perceptions of their effectiveness (i.e., H3). Fig. 1 provides an overview of the studies.

3.1. Study 1: Field study of consumers' affective reactions to social tweets from retailers

While we propose that social appeals generally have beneficial effects on marketing outcomes for retailers that use them (i.e., H1), observing real-life effects of in-store communication on customer attitudes is often impossible during a crisis. However, during the COVID-19 outbreak, consumers were not only confronted with extraordinary communication in stores (cf. Supplemental Study, Web Appendix A). As we elaborate in the following, the shift to crisis communication during the COVID-19 outbreak was also reflected on retailers' social media channels and their posts on platforms such as Twitter (today: X) greatly resembled in-store communication strategies. The simultaneity in retailers' offline and online communication is particularly valuable for examining field effects of social appeals on marketing outcomes: While in-store messages are one-way, social media channels allow consumers to interact with retailers in response to a post. As such data are a rich source for gauging the effect that particular communication strategies have on recipients (Li et al., 2023; Prentice et al., 2020) and how social media shape consumer reactions in times of crisis (Islam et al., 2021; Naeem, 2021), we rely in Study 1 on quasi-experimental data from Twitter (today: X) to shed light on whether there is a marketing benefit for retailers that use social appeals. By doing so, our work complements recent work by Li et al. (2023) who adopted a similar approach to identify general concerns of retail customers during COVID-19.

3.1.1. Methodology

We systematically collected consumer replies to tweets posted by major U.K. retailers during the peak time of panic buying in the country, that is, one week before and after the U.K. government imposed the first COVID-19 lockdown (i.e., March 15–31, 2020; O'Connell et al., 2021).

We opted for tweets from U.K. food retailers for three reasons: First, as we found that *all* major competitors in the U.K. used their Twitter channels to communicate pandemic-related changes in their stores, we could consider their communication strategies and consumers' affective reaction to these strategies as representative. Twitter's format of short text-based posts represents an ideal social media platform for studying immediate and spontaneous customer responses to retailers' communication strategies. This is especially true as the role of social media for engaging and exchanging information among people increased during a time when lockdowns and social distancing measures restricted other communication modalities (Naeem, 2021). For instance, prior work with Twitter data demonstrated that public online opinions during health emergencies adversely affected public consumption behaviors (Naeem, 2021).

Second, while tweets from early March 2020 still consisted entirely of promotional content, U.K. retailers jointly issued (and tweeted) a letter to reassure consumers of sustained supply on March 15, 2020 (BRC, 2020a), and switched to announcing pandemic-related measures such as purchasing quotas thereafter (BRC, 2020b). Thus, this date represented a natural starting point for data collection. Third, by tweeting the joint letter, introducing purchasing quotas, and announcing priority shopping hours for vulnerable people and/or healthcare workers, U.K. retailers tweeted about three distinct types of measures that greatly overlapped with retailers' in-store communication identified in the Supplemental Study (i.e., informational statements, restrictions, and social appeals). Figure C1 (Web Appendix C) provides
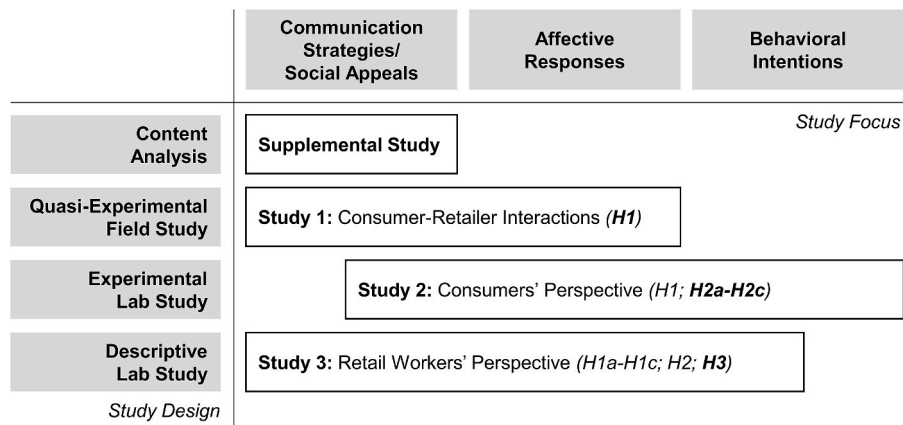
	Communication Strategies/ Social Appeals	Affective Responses	Behavioral Intentions
Content Analysis	Supplemental Study		*Study Focus*
Quasi-Experimental Field Study	**Study 1:** Consumer-Retailer Interactions *(H1)*		
Experimental Lab Study		**Study 2:** Consumers' Perspective *(H1; H2a-H2c)*	
Descriptive Lab Study		**Study 3:** Retail Workers' Perspective *(H1a-H1c; H2; H3)*	
Study Design			

Fig. 1. Study overview (All studies).

examples of each tweet type. To ensure internal validity, our sampling strategy centered on collecting consumer replies to similar tweets from multiple retailers and to different tweets from the same retailer to minimize retailer-specific effects. Furthermore, we focused on retailers that operated both online and offline stores at the time of the tweet and excluded replies from retailers to their own tweets.

Overall, we compiled a sample of 19 tweets from eight retailers that resulted in 2881 consumer replies, which were stored in a database. As these retailers accounted for a 78% market share in spring 2020 (Retailtimes, 2020), the sample could be considered representative of the U.K. retail market. 110 replies were excluded because they either constituted multiple replies from the same consumers or were posted more than 14 days after the retailer's tweet, resulting in a final sample of 2771 replies. We excluded multiple replies from the same consumers to avoid skewing the analysis toward the opinions or actions of a few individuals and set a timeframe assuming that responses that were posted long after the original tweet would not reflect consumers' immediate reactions or sentiments at the time of a retailer's communication.

To classify the retailer tweets, we applied a deductive coding procedure: First, relying on the communication strategies identified in the Supplemental Study (cf. Web Appendix A; Table A1) as an initial coding scheme, two co-authors classified all tweets independently based on the manifest or latent content of the tweet and subsequently discussed their initial impressions. To account for slight differences between retailers' in-store (cf. Supplemental Study; Web Appendix A) and their social media communication, we subsequently adapted the coding scheme and finally differentiated between informational (i.e., the joint letter), purely restrictive (i.e., purchasing quota), or socially motivated restrictive tweets (i.e., priority shopping hours for vulnerable people or healthcare workers). Second, based on the refined coding scheme, both co-authors coded all tweets again in two more iterations until they reached full consensus on the final classifications of all retailer tweets. Therefore, the inter-rater reliability, calculated as the percentage of agreement between the raters in a categorical rating system independent of chance (i.e., "joint probability of agreement"; Uebersax, 1987) amounted to 100%.

Similar to related work (e.g., Li et al., 2023; Prentice et al., 2020), we then performed a sentiment analysis of the consumer replies to the retailer tweets. Sentiment analysis is a text mining technique that quantifies the latent emotional reaction or opinion contained in text, often expressed by polarity between negative and positive sentiments (Li et al., 2023). While all analysis techniques help understand textual data at scale, recent techniques based on machine learning often provide higher accuracy than purely dictionary-based approaches (Ribeiro et al., 2016). This is why we used Google Cloud's Natural Language Processing API (https://cloud.google.com/natural-language) to quantify the sentiment in consumers' written replies to the retailers' tweets. This

procedure resulted in a 'sentiment score' for each reply that can range from −1 (i.e., strongly negative) to +1 (i.e., strongly positive). Backed by social marketing literature (Coleman et al., 2020), we expected that socially motivated measures would lead to the most positive sentiment.

We then ran a regression analysis with the 'obtained sentiment score of a customer reply' as the dependent and the 'communication strategy' in a tweet as the independent variable. To operationalize the communication strategy, it was coded with three dummy variables: 'restrictive' (= 1 if a tweet announced purchasing quotas), 'socially_motivated_vulnerable' (= 1 if a tweet announced priority shopping hours for vulnerable people), and 'socially_motivated_healthworkers' (= 1 if a tweet announced priority shopping hours for healthcare workers). Table B1 in Web Appendix B further explains the details of the dummy-coding procedure. Informational tweets, coded as 0 with respect to all dummy variables, served as the base category to which effects of purchasing quotas and priority shopping hours were compared. Additionally, as the timing of communication strategies in times of emergency can substantially affect their success (Jones et al., 2010), we included 'elapsed time in days' between a given tweet's posting date and the date when the first retailer in the dataset had used the same communication strategy in a tweet. For example, if one retailer announced purchasing quotas in Tweet A on day 1 (i.e., earliest tweet on purchasing quota) and another retailer in Tweet B on day 3, elapsed time in days would equal 0 for Tweet A and it would equal 2 for Tweet B (cf. Web Appendix B; Table B1).

3.1.2. Results

On average, the sentiment of consumers' replies to all tweets was negative ($M = -0.187$, $SD = 0.437$). Tweets on purchasing quotas were received worst ($M = -0.325$, $SD = 0.368$), followed by the joint letter ($M = -0.267$, $SD = 0.452$), while respondents received socially motivated tweets on priority shopping hours for healthcare workers ($M = -0.160$, $SD = 0.438$) and vulnerable people ($M = -0.151$, $SD = 0.448$) best.

Results from the regression analysis supported a positive effect of socially motivated measures on consumer reactions, $R^2 = 0.055$, $F(4, 2766) = 40.51$, $p < 0.001$: When comparing consumer reactions to informational tweets as the reference category with their reactions to purely restrictive tweets on purchasing quotas and to socially motivated restrictive tweets on priority shopping hours, we find a negative effect of purchasing quotas ($\beta = -0.067$, $p = 0.001$) but positive effects of priority shopping hours for vulnerable people ($\beta = 0.107$, $p < 0.001$) and healthcare workers ($\beta = 0.132$, $p < 0.001$) on the sentiment of consumers' replies. We further find that sentiment toward a particular measure deteriorated with time ($\beta = -0.209$, $p < 0.001$), meaning that retailers benefited from more positive reactions if they introduced a measure earlier than their competitors. Taken together, the results of

Study 1 support H1.

3.1.3. Discussion

By examining comprehensive field data stemming from the peak times of panic buying, Study 1 confirms that even restrictive social appeals elicit more positive consumer reactions than non-restrictive information or non-social restrictions. By implication, Study 1 suggests that justifying a restriction with a social cause enhances consumers' acceptance of the restriction. Furthermore, our analysis strengthens the proposition that responding early to extreme changes in consumer behavior in times of emergency creates a competitive advantage for retailers.

The findings of Study 1 align well with our proposition that asking for social behavior in crises is a promising communication strategy for retailers. Still, it is important to emphasize two contextual particularities of field Study 1. First, the social appeals in Study 1 were coupled to restrictions that consumers had to obey, which leaves open the question of whether they would have adopted the socially-desirable behavior voluntarily. Second, Study 1 leverages a unique snapshot of consumer sentiments of a crisis, but Twitter users may not fully represent the general population. Both aspects can imply biases toward certain demographics or behaviors, which may limit the generalizability and external validity of insights drawn from such social media data.

3.2. Study 2: Web-based experiment among consumers

To counterbalance these considerations, we therefore rely in Study 2 on a controlled web-based experiment among consumers to clarify if certain types of social appeals can promote the voluntary adoption of the socially-desirable behavior (i.e., H2a-H2c) and if retailers also benefit from improved marketing outcomes if they use social appeals without enforcement (i.e., H1).

3.2.1. Methodology

Experimental Study Design. We recruited 351 participants on Amazon's Mechanical Turk platform (MTurk) in June 2020 (mean age 38.3 years, 41.3% female). Participants were randomly assigned to one of three social appeal conditions (i.e., EMPATHY, REFERENCE, and THREAT) or one of two control conditions (i.e., BASELINE and OPENINGHOURS). In all conditions, except BASELINE, participants were presented a picture of a customer notice on a supermarket shelf, which was either relatively full or empty (i.e., visible scarcity). We manipulated visible scarcity to control for a situational cue that fuels demand (Robinson et al., 2016) and possibly affects the effectiveness of social appeals. In the appeal conditions, the customer notice contained one of the social appeals, while participants in OPENINGHOURS read information about new opening hours. BASELINE did not feature any visual or textual stimuli (cf. Web Appendix C; Table C1 for an overview of the experimental stimuli). Thus, the experiment corresponded to a 5 (2 control and 3 social appeal conditions) x 2 (high vs. low visible scarcity) between-groups fractional factorial design (cf. Web Appendix B; Figure B1).

In light of RQ2, the study design allowed us to test whether social appeals lowered panic buying intentions (i.e., H2a-H2c) by comparing the social appeal conditions (i.e., EMPATHY, REFERENCE, and THREAT) with BASELINE. With regards to RQ1 and H1, we could test whether the presence of any of the three social appeals improved customer attitudes and loyalty intentions toward a retailer against an appeal-free customer notice (i.e., OPENINGHOURS).

Development of Experimental Stimuli. All experimental stimuli are displayed in Web Appendix C, Table C1. The positive injunctive EMPATHY appeal was a personalized appeal from a fictitious nurse called "Amy". Addressing recipients' empathy is a typical way to frame a positive injunctive appeal (Brennan and Binney, 2010) as helping others is generally valued by society (Schwartz and Bardi, 2001), which implies it as an injunctive norm per se. However, prior work suggests that empathy needs to be nurtured (Pfattheicher et al., 2020). Particularly,

the 'identifiable victim effect' suggests that picturing a specific individual in need (rather than an anonymous group or general society) decreases the psychological distance to the victim (Trope and Liberman, 2010) and increases people's willingness to help (Kogut and Kogut, 2013). We sought to build on this effect with the personalized appeal from "Amy", as a nurse represented a group of people who assumed a critical role in the COVID-19 pandemic, while media had widely covered how they particularly suffered from panic buying due to their exceptional working hours (e.g., BBC, 2020).

To develop the descriptive REFERENCE appeal, we relied on a prior study that showed how describing the prevalent behavior of a reference group can serve as a behavioral guideline for recipients in uncertain social situations (Goldstein et al., 2008). Similar to Goldstein et al. (2008), REFERENCE specified the percentage of consumers who were shopping normally, which we estimated based on secondary survey data (Ipsos, 2020).

The negative injunctive THREAT appeal was designed to imply a threat to the social acceptance of panic buyers. Therefore, the developed stimuli reflected a retail manager's (derogatory) thoughts on customers who empty supermarket shelves to provoke compliance with the socially desirable behavior. While we conceptually drew from prior studies in which participants read others' negative thoughts on the non-compliant behavior (Schoenbachler and Whittler, 1996), the wording was based on a real-life threat appeal from the time of the COVID-19 outbreak (Swinney, 2020).

Measurements. As panic buying is commonly regarded as undesirable behavior (Yuen et al., 2022), we expected participants to understate their true panic buying intentions. Therefore, for measuring panic buying intentions after the experimental stimuli (BASELINE without), we described panic buying as a worldwide phenomenon during the first wave of the pandemic and asked participants how many supplies *everyone* should (instead of how many supplies *they* would) stockpile at home in the event of another wave of infections (cf. 'indirect questioning' technique; Fisher, 1993). We measured panic buying intentions in stockpiling days of five different products (cf. Web Appendix D; Table D1) that had seen immense surges of demand during the first COVID-19 wave (O'Connell et al., 2021).

All other measurements of dependent variables (i.e., irritation, positivity, persuasiveness, and loyalty intentions) were adapted from established multi-item Likert scales (cf. Web Appendix D; Table D1 for an overview of the measurements including an evaluation of their reliability and validity).

3.2.2. Results

Consumer behavior change outcome: Panic buying intentions. As participants could enter any number of stockpiling days, panic buying intentions were non-normally distributed. Therefore, we base the statistical analysis on the log-transformed scale (Field, 2009), but report
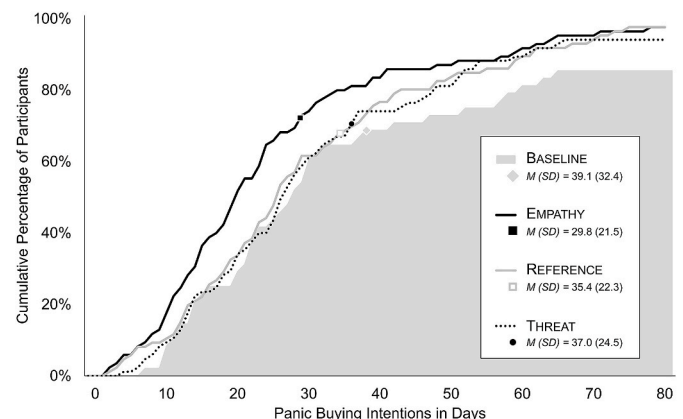

Fig. 2. Cumulative panic buying intentions (Study 2).

cumulative distributions across conditions in Fig. 2 and 1%-trimmed means for clarity. These reflect tendencies in the data sufficiently well.

Overall, panic buying intentions amounted to 35.0 days ($SD = 24.9$) and differed by almost ten days between EMPATHY ($M = 29.8$ days, $SD = 21.5$) and BASELINE ($M = 39.1$ days, $SD = 32.4$). REFERENCE ($M = 35.4$ days, $SD = 22.3$) resulted in similar panic buying intentions as the grand mean, whereas they were highest among all appeal conditions in THREAT ($M = 37.0$ days, $SD = 24.5$). Persuasiveness ratings significantly correlated with lower panic buying intentions, $r(227) = -0.20$, $p = 0.002$.

To test individual effects of the social appeals on panic buying intentions against BASELINE, we performed a regression analysis with log-transformed panic buying intentions as the dependent, dummy-coded treatment conditions as the independent, and visible scarcity as a control variable so that exponentiated coefficients of the appeals reflected percentages of panic buying intentions in BASELINE, $R^2 = 0.045$, $F(4, 263) = 3.08$, $p = 0.017$. Results supported significantly lower panic buying intentions in EMPATHY (-26.69%, $\beta = -0.194$, $p = 0.028$), insignificantly lower intentions in REFERENCE (-7.63%, $\beta = -0.050$, $p = 0.571$), and no effect in THREAT ($+1.51\%$, $\beta = 0.009$, $p = 0.915$). Visible scarcity had no significant effect ($p = 0.099$), while a robustness check implied that excluding visible scarcity from the full model did not alter the appeal effects. Taken together, H2a was supported, while H2b and H2c were rejected.

Marketing outcomes: Loyalty intentions, irritation, and positivity. In a two-way independent MANOVA, we tested whether customer loyalty intentions and attitudes improve if retailers use (vs. do not use; i.e., OPENINGHOURS) social appeals unless they use THREAT (i.e., H1). Results supported an effect of social appeals on all marketing outcomes, Pillai's trace $V = 0.176$, $F(9, 912) = 6.31$, $p < 0.001$, whereas visible scarcity affected marketing outcomes marginally, Pillai's trace $V = 0.025$, $F(3, 302) = 2.56$, $p = 0.055$. Fig. 3 yields an overview of the results.

One-sided Dunnett's *post hoc* tests confirmed that EMPATHY evoked more favorable outcomes than the appeal-free OPENINGHOURS condition in terms of stronger loyalty intentions ($p = 0.031$), and less irritation ($p = 0.006$), but not in terms of positivity ($p = 0.156$). While results overall supported H1 for EMPATHY, marketing outcomes in REFERENCE were only insignificantly better than in OPENINGHOURS (e.g., loyalty: $p = 0.227$); THREAT deteriorated all marketing outcomes.

3.2.3. Discussion

Study 2 shows that in crises when consumers engage in panic buying, a positive injunctive appeal (i.e., EMPATHY) proves effective in lowering panic buying intentions, while a negative injunctive appeal (i.e., THREAT) and a descriptive appeal (i.e., REFERENCE) do not. This aligns with the reactance theory, as positive injunctive appeals focus on the value of helping others, which can resonate well during crises when consumers seek ways to contribute positively. By contrast, negative injunctive appeals, with their emphasis on threats to social acceptance, are more likely to trigger reactance. Beyond their effects on panic buying intentions, we further demonstrate that using social appeals – except THREAT – improves marketing outcomes for retailers.

3.3. Study 3: Web-based study among retail workers

While we examined in Study 2 how consumers react to social appeals and find that certain appeals can effectively curb panic buying, Study 3 centers on why retailers barely adopted social appeals during the COVID-19 outbreak. To test whether retailers' reluctance to use social appeals was due to low familiarity with using them, Study 3 adds the perspective of frontline retail workers who were dealing with panic buying in their job. Specifically, we show that workers who know social appeals from their stores are more confident that social appeals can curb panic buying and improve customer attitudes than workers unfamiliar with them (i.e., H3). Furthermore, as Study 3 mirrors Study 2 but deals with worker perceptions of social appeals rather than consumer reactions to them, it allows us to triangulate the results of Study 2 and demonstrate that retail workers would assume similar consumer reactions to social appeals as we found in Study 2 (i.e., H2a-H2c and H1).

3.3.1. Methodology

We conducted a web-based study on MTurk among 92 frontline employees (mean age $= 37.0$ years, 32% females). By using multiple
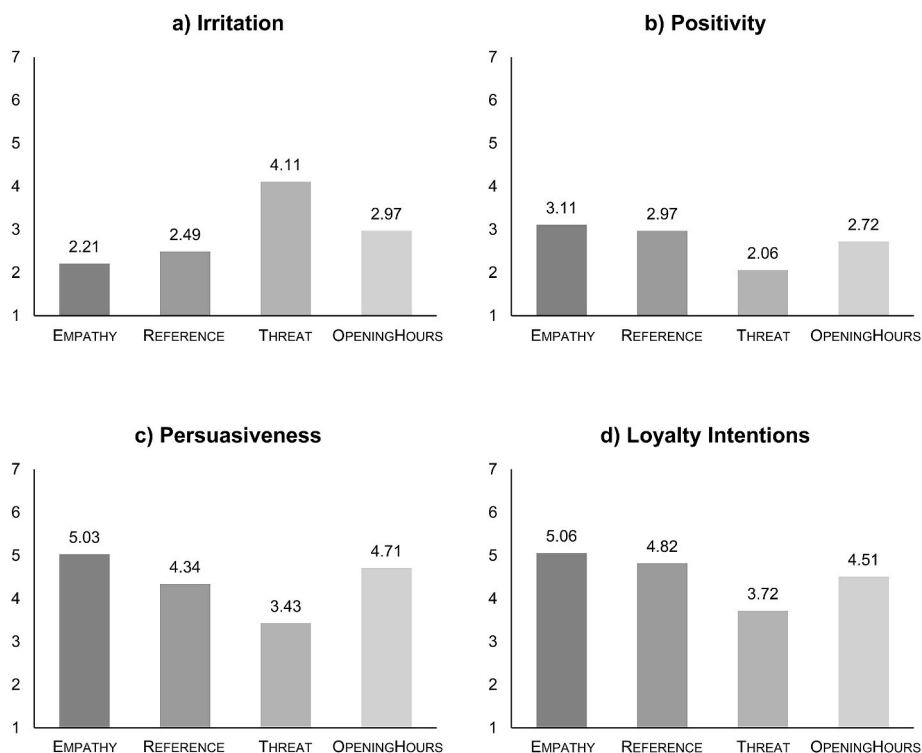

Fig. 3. Descriptive statistics for marketing outcomes (Study 2).

screening questions, we ensured that the final sample only consisted of employees who had been working at the frontline for a U.S. grocery retailer when panic purchases peaked in the U.S. in spring 2020.

To assess participants' general experience with customer notices to curb panic buying, they were first presented three generic notices (i.e., informational statements, restrictions, and social appeals; cf. Supplemental Study, Web Appendix A) and asked to indicate whether their employer had posted similar notices in spring 2020 (cf. Web Appendix C; Table C1). Those who agreed (90.2%) assessed how customers reacted to their notices in terms of irritation and positivity and rated the persuasiveness and the presumed impact of the notices on panic buying. We used the same scales as in Study 2, except for the 'presumed impact on panic buying' which we designed to mirror the measurement of consumer panic buying intentions in Study 2 from frontline workers' perspective (cf. Web Appendix D; Table D2).

Thereafter, participants were presented the three social appeals used in Study 2 (cf. Web Appendix C; Table C1) and asked to rate their familiarity with each type and to assess how their customers would have reacted to them on the same scales as for their retailer's notices. Scale items are depicted in Table D1 (Web Appendix D). Taken together, the design of Study 3 allowed us to measure whether retail workers' assessment of social appeals depended on their familiarity with them and how effective they considered social appeals in comparison to their employer's actual strategy to curb panic buying.

3.3.2. Results

In line with the results of the Supplemental Study on the low prevalence of social appeals (cf. Web Appendix A; Table A2), retail workers' familiarity with any social appeal on a 7-point Likert scale was low ($M = 2.70, SD = 1.48$). At the same time, descriptive results implied that retail workers familiar (vs. unfamiliar) with social appeals evaluated all social appeals more (vs. less) positively along all dimensions. Additionally, mirroring the findings from Study 2, retail workers rated EMPATHY most and THREAT least favorably.

To test these differences, we performed factorial repeated-measures ANOVAs with communication strategy (i.e., EMPATHY, THREAT, and REFERENCE vs. retailers' real-life customer notices) as within-subjects and familiarity with social appeals (i.e., familiar vs. unfamiliar) as between-groups factor. Results supported main effects of familiarity with social appeals on positivity, $F(1, 75) = 8.21, p = 0.005$, persuasiveness, $F(1, 75) = 23.36, p < 0.001$, and presumed impact on panic buying, $F(1, 75) = 20.65, p < 0.001$, but not on irritation, $F(1, 75) = 1.65, p = 0.267$. That is, retail workers familiar with social appeals consistently expected social appeals to evoke more positivity, to be more persuasive, and presumed them to curb panic buying significantly better than workers unfamiliar with them (cf. Fig. 4), thus providing support for H3.

The ratings of communication strategies were significantly correlated within participants in all analyses, so degrees of freedom were corrected using Greenhouse-Geiser estimates of sphericity (with epsilon ranging from 0.774 to 0.921) to prevent inflated Type I errors. Still, results supported significant ($p_{max} < 0.001$) main effects of communication strategy on positivity, $F(2.32, 174.26) = 15.25$, irritation, $F(2.48, 185.95) = 29.53$, persuasiveness, $F(2.68, 200.90) = 32.69$, and presumed impact on panic buying, $F(2.76, 207.12) = 16.24$.

Considering the assumption that social appeals would fare better than real-life notices, we further compared retail workers' assessment of their real-life notices to their assessment of each social appeal type using Bonferroni-adjusted post hoc tests. Crucially, these analyses corroborated major findings from Study 2. While THREAT was rated strictly undesirable along all dimensions (e.g., $M_{THREAT\_PANICBUY} = 2.12, SD = 1.55$ vs. $M_{RETAILERCN\_PANICBUY} = 2.71, SD = 1.54, p = 0.006$), retail workers assessed REFERENCE and EMPATHY more favorably than real-life notices. In
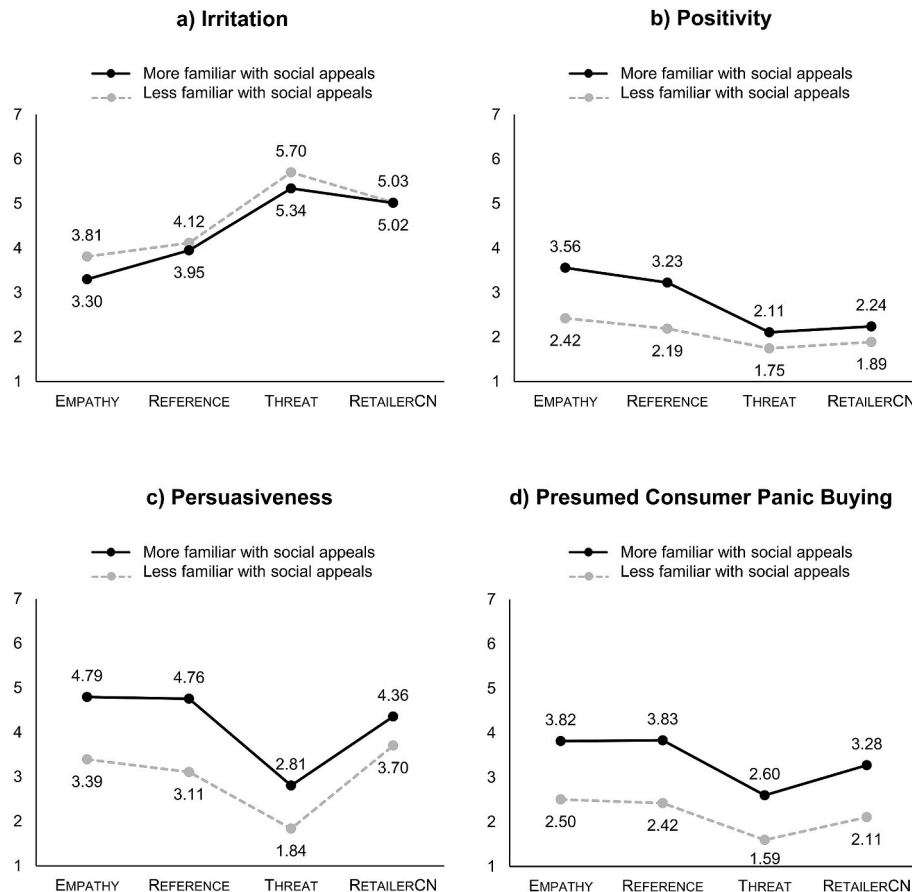

Fig. 4. Marketing outcomes within and between groups (Study 3).

particular, they considered real-life notices to evoke less positivity ($M_{RetailerCN\_Pos} = 2.07$, $SD = 1.25$) and more irritation ($M_{RetailerCN\_Irr} = 5.02$, $SD = 1.51$) than Reference ($M_{Ref\_Pos} = 2.73$, $SD = 1.68$, $p < 0.001$; $M_{Ref\_Irr} = 4.03$, $SD = 1.54$, $p < 0.001$) and Empathy ($M_{Empathy\_Pos} = 3.01$, $SD = 1.71$, $p < 0.001$; $M_{Empathy\_Irr} = 3.55$, $SD = 1.64$, $p < 0.001$), and eventually presumed Reference ($M_{Ref\_PanicBuy} = 3.16$, $SD = 1.72$, $p = 0.021$) and Empathy ($M_{Empathy\_PanicBuy} = 3.19$, $SD = 1.66$, $p = 0.046$) to curb panic buying significantly better than the notices that they knew from their stores ($M_{RetailerCN\_PanicBuy} = 2.71$, $SD = 1.54$). Taken together, the results provide support for H1 and H2a-H2c.

3.3.3. Discussion

By integrating retail workers' perspectives, Study 3 not only substantiates the results of Study 2 and confirms that a positive injunctive (i. e., Empathy) and a descriptive (i.e., Reference) social appeal can induce favorable customer responses. Critically, Study 3 demonstrates that retail workers familiar (vs. unfamiliar) with social appeals were more (vs. less) confident in their effectiveness, which helps explain why retailers rarely adopted them (cf. Supplemental Study, Web Appendix A).

While this implies an adoption barrier to the use of social appeals, the observation that retail workers generally expected more favorable customer responses to social appeals than to their employer's actual notices pinpoints to the untapped potential of social appeals from a marketing perspective. Especially in uncertain times, retailers need to communicate that they care about customers' well-being to sustain customer loyalty post-crisis (Pantano et al., 2020) – and our studies show that social appeals are a suitable tool to do this.

4. General discussion

Recent studies suggest that retailers' prevalent strategy to curb panic buying in the early days of the COVID-19 pandemic (i.e., purchasing quotas and informational statements) failed to achieve the desired effect (O'Connell et al., 2021). We investigated a novel approach to curb panic buying that draws on consumers' voluntary contribution to solving the problem: social appeals. Addressing RQ1, we demonstrate that using social appeals – except for a negative injunctive social appeal – greatly improves marketing outcomes for retailers. With regards to RQ2, we show that a positive injunctive social appeal effectively lowers panic buying intentions in crises. Eventually, addressing RQ3, we also identify a barrier to the use of social appeals: retailers' unfamiliarity with them. Overall, our findings offer important theoretical contributions to social and retail marketing in times of crisis, and actionable managerial implications.

4.1. Theoretical contributions

While researchers widely acknowledge the importance of containing panic buying (e.g., Jones et al., 2010; O'Connell et al., 2021; Pantano et al., 2020), little is known about how retailers can effectively prevent the behavior at the point-of-sale. Thereto, our research offers three main theoretical contributions:

First, we build on evidence from past crises and propose that counting on people's social behavior in such times is not a losing battle. While past research has demonstrated the power of social appeals in normal times (Brennan and Binney, 2010), our studies show that consumers remain receptive to adequately framed social appeals promoting behavior that benefits others even in times that incite them to behave in an undesirable way. This finding expands the applicability of social appeals (e.g., Goldstein et al., 2008; Kavvouris et al., 2020; White and Simpson, 2013; Zheng et al., 2023) but challenges the notion of panic buying as an inevitable consequence of consumers' inhibited intellectual abilities in crises.

Second, supporting prior work, we find that the effectiveness of social appeals hinges on the adequacy of their framing (Melnyk et al., 2022). Among the three social appeal types that we study, only a

positive injunctive social appeal designed to foster people's willingness to help others effectively lowers panic buying intentions, while a descriptive appeal shows little effect, and a negative injunctive social appeal not only fails to elicit behavior change but also provokes negative emotional responses that are undesirable for retailers. We argue that being able to help others is a valuable proposition, especially in times when consumers perceive a loss of control. By implication, we reason that a descriptive social appeal proved ineffective because the prospect of imitating others' behavior changes little about why consumers are inclined to panic buy. In light of the reactance theory, we further reason that a negative injunctive appeal emphasizing the social cost of the undesirable behavior likely backfired, because it adds another threat to the threat of the crisis (Muthusamy et al., 2009) and further undermines people's sense of freedom. Such an appeal thus likely leads to a motivational state of psychological reactance both in regards to panic buying intentions and customers' perceptions of the retailer. Importantly, this finding contributes to the understanding of consumer behavior during crises, suggesting that communication strategies relying on coercion may yield counterproductive results.

Third, we conceptually differentiate panic buying in crises and scarcity marketing in normal times to emphasize that – in contrast to the sales of limited editions – panic purchases run counter to a retailer's commercial interests (Helm et al., 2013; Shi et al., 2020; Kouvelis, 2022; Kirk and Rifkin, 2020; Rudert and Janke, 2022). As a social appeal's effectiveness is not the only question of concern when commercial interests are at stake, we also examine how recipients' emotional responses to social appeals affect their perceptions of the retailer. Adding to work in cause-related marketing (Coleman et al., 2020; Pantano et al., 2020), we demonstrate that social appeals generally improve customer attitudes and loyalty intentions toward retailers and that even at peak times of panic buying, consumers received socially motivated restrictions better than mere quantity restrictions or unrestrictive assurances of sustained supply.

4.2. Managerial implications

When panic buying escalated during the early days of the COVID-19 pandemic, many retailers reacted impressively fast, but *how* they reacted differed remarkably (Pantano et al., 2020). We show that their least prevalent communication strategy to curb panic buying – social appeals – is likely the most effective one to tackle panic buying. Thus, the present research offers actionable guidelines for practice:

First, with social appeals, we propose a strategy that relies on consumers' voluntary contribution to solving the problem. In contrast to popular belief that crises inevitably lead to panic and antisocial behavior, we demonstrate that consumers are willing to rethink their behavior when a social appeal subtly reminds them of the social value that changing their behavior has for others. Therefore, we reason that unobtrusive social appeals are an underestimated communication strategy to lower panic buying intentions at the point-of-sale.

Second, we show that promoting socially desirable behavior and pleasing customers is generally not a trade-off. Except for a negative injunctive social appeal, which not only proved ineffective but also backfired on the social retailer, we find that using social appeals improves customer attitudes and loyalty intentions toward a retailer. Furthermore, our analysis of consumer reactions in the field (Study 1) suggests that retailers benefit from introducing socially motivated restrictions earlier than their competitors.

Third, there is more potential than risk for retailers in using social appeals, given their positive effects on marketing outcomes and given the differences in purchasing quantities that even small reductions in mass panic buying imply. Still, our analyses indicate an adoption barrier to the use of social appeals: While the prevalence of social appeals in real-life was generally low (cf. Supplemental Study, Web Appendix A), employees of retailers that actually used social appeals were not only more convinced of their retailer's communication strategy during the

COVID-19 pandemic, but also more confident of the effectiveness of social appeals than workers unfamiliar with them (i.e., Study 3). Overall, this highlights the need to broadly inform retailers, communication agencies, but also policy makers about the effects of different communication strategies using social appeals during crises.

4.3. Limitations and future research directions

Like any research, this work has limitations that point to future research directions (RDs). First, our experimental design in Study 2 allowed us to measure panic buying *intentions,* which do not necessarily translate into behavior changes (cf. intention-behavior gap; e.g., Sheeran et al., 2017). Future field experiments could examine how the social presence of other customers and observing their behavior affects social dynamics under real-world conditions or, for example, in virtual reality environments (RD1).

Second, even though significant effort has been put into crafting the most condensed versions of the social appeals, we only tested representative types. Future research could control for different nuances of each appeal (RD2) or their interaction with other measures (RD3) such as purchasing quotas in hybrid messages.

Third, while we focused on in-store panic buying, the COVID-19 pandemic has increased the share of online retailing tremendously (Stanca et al., 2023). Future research should investigate whether consumers are reluctant to comply with social appeals due to the absence of social judgment in an online shop or whether the safety of one's home increases their receptiveness to such appeals (RD4).

Finally, we focused on the effects of social appeals on a particular undesirable behavior (i.e., panic buying) in a specific crisis (i.e., the COVID-19 pandemic) and only measured one-off effects on panic buying intentions. However, we do not know whether social appeals can prevent other undesirable behaviors in future crises (RD5), how social appeals affect consumer behavior once a crisis ends (RD6), or how consumers' prior exposure to scarcity (e.g., resource scarcity during childhood; Mullainathan and Shafir, 2013) explain their reactions to social appeals (RD7).

5. Conclusion

Contrary to popular belief and prevalent practice, this work shows that drawing from consumers' voluntary contribution to solving a problem can be a fruitful avenue in crises. In three studies, we show that retailers not only benefit from positive consumer reactions such as greater loyalty and favorable attitudes when they use social appeals but that adequately designed social appeals are also an effective communication strategy to curb undesirable behaviors such as panic buying in crises.

CRediT authorship contribution statement

Sandro Arnet: Writing – review & editing, Writing – original draft, Visualization, Validation, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Marcia Nißen:** Writing – review & editing, Writing – original draft, Visualization, Validation, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Florian von Wangenheim:** Writing – review & editing, Supervision, Resources, Funding acquisition, Conceptualization.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used Grammarly (Grammarly Inc., U.S.) and DeepL Translator (DeepL SE, Germany) in order to improve readability and language. After using these tools, the authors constantly reviewed and edited the content as needed and take full responsibility for the content of the publication. The author did not use any generative AI technologies for the preparation of this work.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jretconser.2024.103884.

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