Context and the Perceived Fairness of Price Increases Coming out of COVID-19

David Chavanne | Zak Danz | Jitu Dribssa | Rachel Powell | Matthew Sambor

Connecticut College, New London, Connecticut

Correspondence
David Chavanne, Connecticut College Department of Economics, 260 Mohegan Avenue, New London, CT 06320
Email: dechavann@conncoll.edu

Abstract
Objective: As the U.S. economy responds to prolonged COVID-19 disruptions, it is important to understand what factors affect the perceived fairness of pandemic-driven price increases.

Methods: Participants read a vignette and rated how fair they found a pandemic-driven price increase. Versions vary (1) the source (hardware-store products or bus fare), (2) the magnitude of the price increase (6 percent or 18 percent), and (3) the tone of an initial description of COVID (positive or negative).

Results: The price increase was perceived to be fairer when it involved the hardware store or when it was smaller. The relationship between fairness and magnitude was context-specific, as fairness perceptions were insensitive to the magnitude of the price increase in the bus scenario or when the initial description of COVID had a positive tone.

Conclusion: Retailers and municipalities may face different fairness constraints as they consider pandemic-driven price increases. The tone of COVID information may affect price fairness through its impact on sensitivity to magnitude.

As more components of economic life open up in the United States in the aftermath of widespread vaccination against COVID-19, pandemic-driven changes in economic conditions will inevitably affect price levels. As shown in the seminal work of Kahneman et al. (1986a, 1986b) and Bolton et al. (2003), context-dependent attitudes toward price increases can serve as a constraint that interferes with market-clearing price adjustments. Yet, while the perceived fairness of price increases has been widely studied, businesses and municipalities contemplating price increases have little empirical guidance to help them anticipate public sentiment toward higher prices coming out of a crisis as intense, impactful, and emotionally charged as the COVID-19 pandemic.

The analysis presented here examines how the perceived fairness of COVID-19-driven price increases varies across different contexts. It uses different versions of a vignette that describes a price increase, which occurs as the economy opens up following the severe disruptions caused by the pandemic. To study context-dependence, three variables are systematically manipulated within the vignette while all other aspects remain equivalent. First, in light of the diverse types of economic domains that face potential price
increases coming out of the pandemic, the vignette varies whether the price increase involves a hardware store raising the prices of its products or a city raising the price of bus fare. Any differences between fairness perceptions across these two sources would suggest that cities and municipalities considering increases in the prices of their services post-COVID should think differently about the resulting public sentiments as compared with standard retail entities. Second, the vignette varies the magnitude of the price increase (6 or 18 percent) in order to test how fairness perceptions change with the magnitude of a price increase. Third, motivated by the disproportionately negative tone of COVID-19 coverage within U.S. news media (Sacerdote et al., 2020), as well as an earlier finding in the price-fairness literature that the emotional tone of photographs can affect the perceived fairness of price increases (Heussler et al., 2009), the vignette varies whether an introductory description highlights negative aspects of the pandemic (emphasizing loss, disruption, and vaccine inaccessibility) or positive aspects of the pandemic (emphasizing resilience, sacrifice, and vaccine development). In light of the diverse ways that media exposure can have economic and social impacts (DellaVigna and La Ferrara, 2015), the analysis tests whether it is reasonable to expect the underlying negativity of COVID-19 news coverage to affect attitudes toward pandemic-driven price increases.

By testing the effects of the source (bus or hardware store), the magnitude of the price increase and the emotional tone of the description of COVID-19—and by examining how these variables interact—the analysis attempts to provide insight into what factors might be driving COVID-related perceptions of price fairness. The study’s results show main effects associated with the source and with the magnitude of the price increase, as the price increase was considered to be fairer when it was the decision of the hardware store (as compared with the city raising bus fare) or when it was small (as compared with large). There was no main effect associated with the emotional tone of the COVID description, however. In addition, the effects of the variables interacted in two noteworthy ways. First, a smaller price increase is only considered to be fairer than a larger price increase for the hardware-store scenario, indicating that the perceived fairness of a municipality’s decision to increase bus fare is less sensitive to how much the municipality increases the price. Second, despite there being no overall difference in perceived fairness across the negatively and positively toned description of COVID, the results show that fairness perceptions are affected by the magnitude of the price increase only when the negatively toned description is provided. Highlighting the positive aspects of the pandemic, similar to what was observed in the bus scenario, therefore serves to mute the responsiveness to the magnitude of the price increase.

This study analyzes perceptions of price fairness in the context of the U.S. economy as the heights of the pandemic recede and, as such, attempts to provide general insights regarding how context affects perceptions of price fairness in the aftermath of severe crises. Moreover, given that any price increase must come bundled with a decision regarding how much to increase prices, the study intends to shed light on when businesses and municipalities should expect stakeholder perceptions of fairness to be sensitive to both the existence of a price increase and to a price increase’s magnitude.

PRICE FAIRNESS AND EMOTIONAL ANTECEDENTS

The context dependence of the perceived fairness of prices has been a widely studied topic. Although fairness preferences are analytically separate from willingness to purchase and actual purchasing behavior, studies have found that a price increase that is perceived to be unfair reduces consumers’ satisfaction (Herrmann et al., 2007) and willingness to purchase (Campbell, 1999; Hupertz et al., 1978; Konuk, 2018; Malc et al., 2020; Maxwell, 2002; Xia et al., 2004; Yen, 2019), and unfair pricing has been found to decrease real, as opposed to hypothetical, demand (Anderson and Simester, 2008; Sonnabend, 2016). Seminal papers by Kahneman et al. (1986a, 1986b) found that price increases involving consumer goods, wages, and rents were more likely to be found fair when the higher price was necessary to preserve a reference profit (and less likely to be fair when it took advantage of increased demand). While Kahneman et al. (1986a, 1986b) focused on past prices as the source of reference transactions that drive perceptions of price fairness, Bolton et al. (2003) showed that comparisons to competitor prices and to vendor costs also shape the perceived fairness of a particular price increase. Studying responses to safety-driven changes in
business practices during the COVID-19 pandemic, Friedman and Toubia (2022) found that, in situations when product quality is degraded, lost consumer surplus drives perceptions of price fairness rather than a seller’s entitlement to reference profit. Looking beyond the effect of reference transactions, other work has found that price increases are perceived to be more unfair when customers infer negative motives (Campbell, 1999), when they come from human sources (e.g., a salesman) as opposed to non-human sources (e.g., marketing communication) (Campbell, 2007), when there are perceptions of seller volition (Vaidyanathan and Aggarwal, 2003) and when price-setting procedures deviate from socially acceptable rules (Maxwell, 2002).

Extending beyond general findings of context dependence in perceptions of price fairness, many other studies have examined the specific role that emotions play as antecedents to price fairness. Xia et al. (2004) emphasized the role of affective responses in their conceptual framework of price-fairness perceptions. Expanding on this conceptual framework, Malc et al. (2020) found a strong relationship between negative emotions induced by a price change (irritation, anger, discontent, and sadness) and perceptions of price fairness. Campbell (2007), studying the differential effects of human and non-human sources of price information, found that human-generated price increases led to significantly higher levels of negative affect compared with non-human-generated price increases. O’Neill and Lambert (2001) explored how the emotions generated by a price interact with consumer characteristics and drive responses to prices; they found that characteristics associated with product familiarity lead to greater levels of enjoyment and surprise from a price. Heussler et al. (2009) showed that emotions induced by photographs significantly affect the perceived fairness of a price increase and the stated willingness to pay for a good. Specifically, participants who saw photographs that induced negative emotions (e.g., soldier, famished dog, cemetery, and dead cow) rated price increases as being significantly less fair (and were willing to pay significantly less for the good) compared with participants who saw photographs that induced positive emotions (e.g., sunset, father and baby, puppies, and rabbit).

The study run by Heussler et al. (2009), to our knowledge, is the only work that has drawn a connection between incidental emotional states (which stem from stimuli that are separate from the decision tasks being examined) and responses to price increases. Additional work, however, points to a robust relationship between incidental emotions and other behavioral economic phenomena, as they have been found to influence risk preferences (Mittal and Ross, 1998; Yang et al., 2020; Zhao et al., 2016), time preferences (Lempert and Phelps, 2016; Luo et al., 2014), and economic decisions (Lerner et al., 2004). Most relevant to the present study, there is also an established connection between incidental emotions and perceptions of fairness. Andrade and Ariely (2009), Harlé et al. (2012), Harlé and Sanfey (2007), Liu et al. (2016), and Moretti and Di Pellegrino (2010) all found that incidental negative emotions increased second-movers’ rejection rates of unfair offers in ultimatum games, leading to outcomes with both players earning 0, rather than the second-mover earning a disproportionately lower share of the surplus.

Looked at collectively, this research on incidental emotions provides an important source of motivation for varying the positivity or negativity of the description of COVID at the start of the vignette in the present study. Sacerdote et al. (2020) analyzed the text of English language news sources and found that media coverage of the pandemic in the most popular U.S. sources is significantly more negative in tone compared with coverage in international sources. In light of this evidence regarding the negativity of coverage in the United States, it is important to understand the consequences that negative information about the pandemic has on the economy and social life more generally. The study presented here represents an initial test of whether positive and negative information about COVID-19 have different effects on how people perceive the fairness of post-COVID price increases. The manner in which the initial description of COVID is presented using a positive or negative tone resembles the experimental manipulations used in the issue framing literature (Tversky and Kahneman, 1986), which describes how positive and negative framing affects judgments and decisions across a variety of domains, including distributive justice (Gamliel and Peer, 2006), product quality assessment (Levin and Gaeth, 1988), purchase intentions (Jin et al., 2017; Yang et al., 2018), support for international trade (Hiscox, 2006), risk-taking (Mittal and Ross, 1998), and cooperation (Andreoni, 1995).
In addition to exploring effects attached to the manipulation of the positivity or negativity of a description of COVID-19, the design also varies the magnitude of the price increase and whether the source of the price increase is a retail context or a public service. Earlier work has found both the magnitude and source of a price change to affect perceptions of price fairness. Regarding price-change magnitude, Homburg et al. (2005) found that repurchase intentions decrease as the magnitude of a price increase rises. Heussler et al. (2009), in their study using photograph-induced emotional states, found that smaller price increases were seen as less unfair than larger price increases, and that the effect of emotion on price fairness became less impactful for larger price increases. Ferguson and Ellen (2013) found that larger price increases required more extensive explanations in order for them to be considered to be fair. Tarrahi et al. (2016), in a meta-analysis of the drivers of price fairness, identified the size of the increase as a factor that matters across multiple studies.

Regarding the source of the price increase, earlier work has examined the degree to which perceptions of price fairness vary depending on the type of good or service being exchanged. Kahneman et al. (1986a) found reference transactions to similarly influence perceptions of price fairness across exchanges that involved consumer goods, wages, and rent. Huangfu and Zhu (2012) found that, for Chinese consumers, price increases created by state-owned enterprises were considered to be fairer than equivalent price increases by private companies. Differences in price-fairness perceptions across goods and services have also been explored across several studies. Bolton et al. (2003) found that price increases were considered to be less fair for repeated rental of a good compared to an equivalent service. Bolton and Alba (2006) found that, when price changes were not aligned with changes in costs, increasing the price of services was seen as being fairer than increasing the price of goods. Martín-Ruiz and Rondán-Cataluña (2008) found that, while perceptions of price fairness and unfairness across goods and services share similar antecedents, consumers of services react more strongly than consumers of goods to perceptions of unfair prices. Becker et al. (2017) showed that differential pricing for identical goods/services across different channels (e.g., online or offline) is perceived to be fairer for goods as compared to services. Both Martín-Ruiz and Rondán-Cataluña (2008) and Becker et al. (2017) attribute their findings to the intangibility of services, which increases consumers’ perceived vulnerability to unfair prices (Martín-Ruiz and Rondán-Cataluña, 2008) and makes price differences across channels harder to justify (Becker et al., 2017).

Taking stock, the present study’s design builds off of this earlier work, which shows that emotions, price-change magnitude, and the source of the price change affect the perceived fairness of prices. Although the literature that examines the role that emotions have on price fairness points to emotions being the mechanism that is likely to drive any difference across responses with the positive versus negative description, the present study manipulates the tone of a written description rather than manipulating participants’ emotions explicitly or measuring the emotional response to the stimulus. Since the study aspires to generate insight into how the tone of media coverage potentially affects perceptions of post-pandemic price fairness, knowledge of the psychological mechanism behind different responses to positive- and negative-toned descriptions is less important than knowledge that different responses exist. Moreover, although earlier work examining price fairness provides, and tests for the effects of, explicit information about costs, competition, and/or economic conditions, the present study intentionally leaves such information out of the vignette in order to examine the public’s homegrown perceptions of fairness that arise naturally when they encounter actual price increases.

METHODS AND EXPERIMENTAL DESIGN

Amazon Mechanical Turk (MTurk), a popular tool for crowdsourcing labor tasks and for implementing research studies, was used to recruit and pay participants. Only people in the United States were eligible to participate. Quality control was achieved by restricting access to workers who had at least 90 percent approval rates on past assignments and by embedding a multiple-choice comprehension check into the study, which asked participants to select the description that matched the scenario they read. Any participant who did not answer the comprehension check correctly was omitted from the data analysis. The
study was completed by 1217 people, but 192 answered the comprehension check incorrectly, leaving 1025 participants used in the analysis. Table 1 compares the sample’s demographic information to U.S. population estimates. As is typical with MTurk samples, the study participants are disproportionately whiter and more highly educated than the U.S. general population. Despite not being perfectly representative, the representativeness of MTurk samples exceeds that of the typical convenience sample used in academic research (Berinsky et al., 2012; Buhrmester et al., 2011; Mason and Suri, 2012). Work has also found that “Turkers” replicate established psychological findings (Berinsky et al., 2012; Goodman et al., 2013; Paolacci et al., 2010), express inequality-averse social preferences that parallel those shown by university convenience samples (Beranek et al., 2015) and take actual risks in incentivized tasks that significantly correlate with reported willingness to take risks (Johnson and Ryan, 2020).

After accepting the assignment on MTurk, participants were guided to a Qualtrics survey, where they provided informed consent, were randomly assigned to a condition, and completed the study. They received a confirmation code at the end of the study, which they entered into MTurk to ensure completion and receive payment. The 1025 participants included in the data analysis took, on average, 3.13 minutes to complete the study. All participants were paid $0.65.

The exact wording used in the vignette is provided in Table S1 of the Supplementary Appendix. All versions of the vignette include an introductory description of how everyday life has typically been affected by the pandemic, as well as a description of a post-pandemic price increase. Different versions vary across three dimensions. First, the introductory description of the pandemic has either a negative or a positive tone. The negative version refers to the pandemic as a “horrible tragedy” that has forced us to stay at home, threatened our health and safety, and disturbed our lives. The high death toll is referenced, as is vaccine inaccessibility. In contrast, the positive version refers to the pandemic as something that has “brought opportunities for learning and growth,” leading us to find ways to protect other people’s health and safety. Lives saved through precautions and rapid vaccine development are referenced instead of death and inaccessibility. Second, the price increase either involves a city raising the price of bus fare or a hardware store raising the price of products. Third, the price change is either relatively large (18 percent) or small (6 percent).

The introductory description segues into the description of the price change with the following line for the negative-tone condition: “As we attempt to move on from the horrors of the pandemic and return to normal life, governments and businesses face difficult choices.” In the positive-tone condition, “horrors

### Table 1: Sample compared to U.S. population estimates (all figures taken from 2019 U.S. Census Bureau “U.S. Population and Housing Unit Estimates,” unless otherwise indicated)

| Demographic variables                  | Population estimates | Current sample |
|----------------------------------------|----------------------|----------------|
| Percent female                         | 50.8%                | 45.4%          |
| Median household income                | $62,843              | $45,001–60,000 |
| Median age                             | 38.4                 | 38             |
| Percentage with bachelor's degree or higher | 32.1%                | 69.9%          |
| Percent white (alone)                  | 76.3%                | 78.9%          |
| Percent African American (alone)       | 13.4%                | 9.6%           |
| Percent two or more races               | 2.8%                 | 1.9%           |
| Percent liberal                        | 25%\(^a\)            | 46.9%          |
| Percent moderate                       | 35%\(^b\)            | 15.2%          |
| Percent conservative                   | 36%\(^b\)            | 31.9%          |

\(^a\)2020 Gallop poll (found here: https://news.gallup.com/poll/328367/americans-political-ideology-held-steady-2020.aspx).
of the pandemic” is replaced with “sacrifices we’ve made.” Participants are then told that they will now read about a decision to raise prices, either by a city raising the price of bus fare or by a hardware store raising the price of products, and “we want to know how you feel about this decision.” The vignette then states that the city/store is raising prices “in order to make up for lost revenue during the pandemic,” and that prices are now 6 percent (or 18 percent) higher than they were before the pandemic. Participants then had to indicate how fair they found the decision to raise prices to be on a six-point scale, which included “completely unfair,” “moderately unfair,” “slightly unfair,” “slightly fair,” “moderately fair,” and “completely fair.”

A specific justification for the price increase was given in order to control for implicit assumptions about underlying causes. The justification of making up for lost revenue from the pandemic was specifically chosen because of expectations that it would be morally neutral, leaving space for different perceptions of fairness, and because it makes it clear that the price increase is the result of economic conditions brought about by the pandemic. Given how the presence of any explicit justification has been found to significantly shift perceptions of price fairness (Martin et al., 2009; Maxwell, 2002; Tarrahi et al., 2016), it is likely that the specific justification provided in the vignette exerted a lump-sum effect on price fairness that would differ from, for example, the effect associated with a demand- or cost-driven justification. But, critically, the fact that the same justification is used across all versions of the vignette means that it cannot explain any observed differences across treatments. In addition, providing the revenue-driven justification allows us to shed light on responses to price changes when people perceive that higher prices stem from a desire to make up for lost revenue, even if broader (and typically misunderstood) forces of inflation, supply, and/or demand serve as the actual reason.

In addition to the responses to the vignette, participants’ characteristics along several dimensions were solicited in order to control for personal characteristics and allow for an exploration of connections between personal characteristics and the perceived fairness of post-COVID price increases. Participants were specifically asked their age, gender identity, race, personal income, household income, education level, employment status, political views, and voting choices in the last three U.S. Presidential elections. A short debriefing statement, summarizing the study’s purpose and pointing participants to additional references, closed the study.

**HYPOTHESES**

The experiment can be described as a 2 (positive tone or negative tone) × 2 (bus source or hardware-store source) × 2 (smaller magnitude or larger magnitude), with a total of eight combinations of treatment variables. Main effects associated with magnitude, source, and tone are tested. Letting \( F \) denote distributions of fairness ratings across various conditions, the design will test the following null hypotheses:

- **Magnitude:** \( F_{\text{Small}} = F_{\text{Large}} \)
- **Source:** \( F_{\text{Bus}} = F_{\text{Hardware}} \)
- **Tone:** \( F_{\text{Negative}} = F_{\text{Positive}} \)

Differences across sources and tones will be explored without *ex ante* directional hypotheses \( (F_{\text{Bus}} \neq F_{\text{Hardware}}, F_{\text{Negative}} \neq F_{\text{Positive}}) \) while the alternative hypothesis for the effect of magnitude will predict that \( F_{\text{Small}} > F_{\text{Large}} \).

In addition to main effects, interactions between conditions will also be explored speculatively. Given that any decision to raise prices comes with an additional decision regarding how much to raise prices, context-specific effects that price-change magnitude has on fairness perceptions are important to understand. Specifically, does a municipality weighing an increase in the price of public services have to consider public sensitivity to how much prices increase to the same extent as a store increasing its price? Additionally, in light of the finding by Heussler et al. (2009) that emotions affected price fairness for small, but not large, price increases, it is also worth examining whether magnitude sensitivity to post-COVID
price increases is affected by the emotional tone of information. The analysis will include an exploration for meaningful interactions between variables that help us better understand fairness perceptions of post-COVID price increases in a complex economy.

RESULTS

Table 2 provides mean fairness ratings across the different conditions. Mean ratings range between 3 (slightly unfair) and 4 (slightly fair). The lowest mean fairness rating (3.02) is seen with a large price increase for bus fare, while the largest mean fairness rating (3.87) is seen with a small price increase for hardware-store products. Main effects are measured with Mann–Whitney tests that measure differences in distributions of fairness ratings. Fairness ratings are significantly higher when small price changes are smaller compared with larger ($z = 3.847, p = 0.0001$) and when the price increase involves hardware-store products compared with bus fare ($z = 5.002, p = 0.0000$). There is no significant difference when comparing fairness ratings with positive and negative tone ($z = 0.113, p = 0.9100$). The null hypotheses with respect to the main effects of magnitude and source can therefore be rejected, while the null hypothesis with respect to the main effect of positive/negative framing cannot.

Table 3 presents results from ordered logistic and logistic regressions, which include the entire sample of 1025 participants. The coefficients attached to the manipulated variables reinforce the results provided above under both ordered-logistic regression (with the 1–6 fairness rating as the dependent variable) and logistic regression (with a binary dependent variable set equal to 1 if the participant found the price increase to be “slightly fair,” “moderately fair,” or “completely fair”). Across both ordered logistic and logistic regressions, regardless of whether demographic and socioeconomic/political characteristics are controlled for, price increases are perceived as being fairer when they are smaller and when they involve the hardware store.

Table 4 provides estimates of effect sizes across the full sample (specification 1) and across subsets of the data sorted by the values of manipulated variables (specifications 2–7). Although the analysis relies on marginal effects from logistic regression, the results from Table 3, which compare logistic and
TABLE 3  Ordered logistic and logistic regression results for the entire sample

| Variables                 | Treatments only | Adding demographics | Adding socioeconomic and political |
|---------------------------|-----------------|---------------------|-----------------------------------|
|                           | I. Ordered logit | II. Logit           | III. Ordered logit | IV. Logit | V. Ordered logit | VI. Logit |
| Negative tone             | -0.00910        | -0.108              | -0.0175          | -0.113    | -0.0214         | -0.117   |
|                           | (0.110)         | (0.129)             | (0.111)          | (0.130)   | (0.111)         | (0.132)  |
| Bus                       | -0.549***       | -0.774***           | -0.549***       | -0.778*** | -0.557***      | -0.811***|
|                           | (0.114)         | (0.129)             | (0.114)          | (0.130)   | (0.114)         | (0.132)  |
| Small increase            | 0.410***        | 0.499***            | 0.376***         | 0.474***  | 0.384***        | 0.497*** |
|                           | (0.111)         | (0.129)             | (0.112)          | (0.130)   | (0.112)         | (0.132)  |
| Male                      | 0.377***        | 0.445***            | 0.331***         | 0.407***  |                  |          |
|                           | (0.112)         | (0.131)             | (0.115)          | (0.133)   |                  |          |
| Age                       | -0.010**        | -0.0116**           | -0.00883*       | -0.00954*|
|                           | (0.00440)       | (0.00530)           | (0.00459)       | (0.00562) |
| White                     | 0.200           | 0.310*              | 0.165            | 0.252     |                  |          |
|                           | (0.138)         | (0.163)             | (0.141)          | (0.164)   |                  |          |
| Household income < 30k    |                 |                     |                  |          | 0.139           | 0.248    |
|                           |                 |                     |                  |          | (0.154)         | (0.177)  |
| Advanced degree           |                 |                     | 0.290**          | 0.295*    |                  |          |
|                           |                 |                     | (0.137)          | (0.164)   |                  |          |
| Work full time            |                 |                     | 0.340***         | 0.482***  |                  |          |
|                           |                 |                     | (0.130)          | (0.158)   |                  |          |
| Liberal                   |                 |                     | -0.298***        | -0.399*** |
|                           |                 |                     | (0.111)          | (0.133)   |                  |          |
| Constant                  | 0.262***        | 0.269               | -0.0122          |          |                  |          |
|                           | (0.129)         | (0.277)             | (0.332)          |          |                  |          |
| Pseudo $R^2$              | 0.011           | 0.038               | 0.017            | 0.053     | 0.022            | 0.069    |
| Observations              | 1025            | 1025                | 1025             | 1025      | 1025             | 1025     |

Robust standard errors in parentheses.  
*p < 0.1.  
**p < 0.05.  
***p < 0.01. 

ordered-logistic coefficients for the entire sample, and the results provided in Supplementary Tables S2–S4, which compare logistic and order-logistic coefficients across the subsets sorted by manipulated variables, show that results are substantively similar across the two different regression techniques. Overall, as shown in the first specification of Table 4, participants who saw the bus condition were 18.4 percentage points less likely (p < 0.0005) to find the price increase fair compared with participants who saw the hardware-store condition; participants who saw the small price increase were 11.3 percentage points more likely (p < 0.0005) to find the price increase fair compared with participants who saw the large price increase.

Sorting the data based on which conditions participants were assigned to sheds light on the consistency or conditionality of the effects described above. In contrast to the effect of the bus versus hardware-store source, which remains significant regardless of the price-change magnitude or the positive or negative tone
(p < 0.002 across specifications 1, 4, 5, 6, and 7), the effects of price-change magnitude are observed only under specific conditions. Across the second and third specifications, with the sample sorted by source, the results show that the effect of the price-change magnitude is observed when the price increase involves the hardware store but not bus fare. For participants who saw the version involving the price of bus fare, the smaller price increase is only 5.57 percentage points more likely to be found fair compared with the larger price increase (\(z = 1.30, p = 0.193\)). In contrast, for participants who saw the version involving the price of hardware-store products, the smaller price increase is 16.52 percentage points more likely to be found fair compared with the larger price increase (\(z = 4.25, p < 0.0005\)). Additional support for the conditionality of the effect of price-change magnitude is shown across specifications six and seven of Table 4, which sort the data based on whether the positive or negative description of COVID was observed. The smaller price increase is only 6.44 percentage points more likely to be found fair than the larger price increase when the positive description of COVID is provided (\(z = 1.55, p = 0.122\)). In contrast, the smaller price increase is 16.20 percentage points more likely to be found fair when the negative description is provided (\(z = 4.05, p < 0.0005\)). This final result suggests that the positive or negative tone of the description of COVID, despite having no overall effect in the aggregated data, may impact perceptions of price fairness through

| Variables                      | Full sample | Sorted by source | Sorted by magnitude | Sorted by tone |
|--------------------------------|-------------|-----------------|---------------------|--------------|
|                                | I.          | II. Bus         | III. Store         | IV. Small    | V. Large     | VI. Positive | VII. Negative |
| Negative tone                  | −0.0266     | −0.0338         | −0.0139            | 0.0182       | −0.0655      | −0.171***    | −0.198***     |
|                                | (0.0298)    | (0.0430)        | (0.0412)           | (0.0408)     | (0.0431)     | (0.0397)     | (0.0387)      |
| Bus                            | −0.184***   |                 | −0.239***          | −0.131***    | −0.171***    | −0.198***    |               |
|                                | (0.0278)    |                 | (0.0363)           | (0.0418)     | (0.0397)     | (0.0387)     |               |
| Small increase                 | 0.113***    | 0.0557          | 0.165***           | 0.106***     | 0.0881**     | 0.131***     | 0.0618        |
|                                | (0.0291)    | (0.0428)        | (0.0389)           | (0.0405)     | (0.0429)     | (0.0410)     | (0.0419)      |
| Male                           | 0.0924***   | 0.0804*         | 0.111***           | 0.106***     | 0.0881**     | 0.131***     | 0.0618        |
|                                | (0.0296)    | (0.0435)        | (0.0400)           | (0.0405)     | (0.0429)     | (0.0410)     | (0.0419)      |
| Age                            | −0.00216*   | −0.000096       | −0.00326*          | −0.000760    | −0.00336*    | −0.00527***  | 0.00121       |
|                                | (0.00127)   | (0.00187)       | (0.00169)          | (0.00176)    | (0.00182)    | (0.00173)    | (0.00179)     |
| White                          | 0.0571      | 0.0172          | 0.0971*            | 0.0764       | 0.0320       | 0.0938*      | 0.0157        |
|                                | (0.0371)    | (0.0531)        | (0.0508)           | (0.0513)     | (0.0534)     | (0.0503)     | (0.0542)      |
| Hh income < 30k                | 0.0562      | 0.0776          | 0.0292             | 0.0120       | 0.0930       | 0.0128       | 0.0976*       |
|                                | (0.0401)    | (0.0574)        | (0.0562)           | (0.0544)     | (0.0578)     | (0.0544)     | (0.0577)      |
| Advanced degree                | 0.0670*     | 0.0272          | 0.102**            | 0.0731       | 0.0629       | 0.0528       | 0.0803        |
|                                | (0.0369)    | (0.0533)        | (0.0517)           | (0.0505)     | (0.0538)     | (0.0521)     | (0.0517)      |
| Work full time                 | 0.109***    | 0.160***        | 0.0616             | 0.125***     | 0.0910***    | 0.0565       | 0.155***      |
|                                | (0.0351)    | (0.0530)        | (0.0475)           | (0.0467)     | (0.0524)     | (0.0510)     | (0.0486)      |
| Liberal                        | −0.0905***  | −0.125***       | −0.0531            | −0.0991**    | −0.0860**    | −0.109***    | −0.0619       |
|                                | (0.0296)    | (0.0424)        | (0.0412)           | (0.0405)     | (0.0434)     | (0.0415)     | (0.0421)      |

Observations 1025 500 525 521 504 509 516

Standard errors in parentheses.

*p < 0.1.
**p < 0.05.
***p < 0.01.
an effect on participants’ responsiveness to the magnitude of the price increase. The positive description of COVID dampens the degree to which fairness ratings vary with the size of price increase.

Finally, although the effects of demographics and socioeconomic and political characteristics were not the main interest of the study, and did not motivate explicit *ex ante* hypotheses, the data do shed light on associations between personal characteristics and the perceived fairness of post-COVID price increases. Results from Table 3 show that, overall, males and people who work full time were more likely to find the price increase to be fair, while self-identified liberals are less likely to find the price increase to be fair. Table 4, however, which breaks down the overall effects across the different conditions, points to the effects of personal characteristics being context-dependent. Significant gender differences in perceived fairness are not present when the negative description of COVID is provided (p = 0.140 in specification 7, as opposed to p = 0.001 under the positive description shown in specification 6), and are only marginally significant for increases in the price of bus fare (p = 0.064 in specification 2, as opposed to p = 0.007 under the store scenario shown in specification 3). Those who work full time are not significantly more likely to find the price increase fair under the hardware-store scenario (p = 0.195 in specification 3, as opposed to p = 0.003 under the bus scenario in specification 2). Differences between self-identified liberals and other participants are not observed under the store scenario (p = 0.200 in specification 3, as opposed to p = 0.003 under the bus scenario in specification 2) or when COVID is described in a negative tone (p = 0.141 in specification 7, as opposed to p = 0.008 under the positive description in specification 6). While these results are speculative, and additional studies are needed to generate precise prescriptions for how businesses and municipalities should consider the characteristics of their customers and citizens when anticipating responses to post-pandemic price increases, they provide preliminary evidence suggesting that the effects of personal characteristics on COVID-related price fairness are mediated by context in complex ways.

**DISCUSSION**

Following methods used in other studies of price fairness, the study described here uses different versions of vignettes to examine the context sensitivity of the perceived fairness of post-COVID-19 price increases. As in earlier studies (Ferguson and Ellen, 2013; Homburg et al., 2005; Heussler et al., 2009; Tarrahi et al., 2016), the results found that a smaller price increase was perceived as being fairer than a larger price increase. The source of the price increase was also found to matter, with the price increase perceived as fairer when it came from a hardware store raising prices as opposed to a city raising the price of bus fare, while there was no main effect from differences in the positivity and negativity of an initial description of the COVID-19 pandemic.

Despite the main effects attached to price-change magnitude and source, interactions between the conditions should be considered to better predict how the public will perceive the fairness of post-COVID-19 price increases. Although, overall, the price increase was perceived to be more unfair when it was a city raising the price of a service, the magnitude of the price increase did not affect perceived fairness in the bus scenario. Combined, these results suggest that decisionmakers within cities or municipalities, if they are concerned with the fairness perceptions of the public, may face a lump-sum psychic cost from raising prices that is not highly sensitive to the magnitude of the increase. They should therefore be cautious when considering whether to raise prices but, once the decision to raise prices is made, they can afford to be less cautious when considering how much to raise prices. The hardware store, in contrast, should expect customers’ fairness perceptions to exhibit marginal sensitivity to the size of price increases. Consistent with Kahneman et al. (1986a), participants may feel like a for-profit entity like a hardware store is entitled to reference profits following a pandemic, and a small or moderate price increase may be seen as a means to preserve such profit. A larger price increase, however, may cross a line and be seen as exploitative rather than as an acceptable way to preserve reference profits. For the city raising the price of bus fare, in contrast, participants may not be applying the same standards of acceptable reference profits, with any price increase seen as a violation of public trust regardless of its magnitude. While additional work is needed to
identify the precise way in which reference profits drive post-pandemic fairness perceptions across private and public sources of price changes, the interaction between magnitude and source leads to a clear prescription regarding how retailers and municipalities concerned with the fairness perceptions attached to price increases should differentially consider the tradeoff between (1) whether and (2) how much to raise prices.

Although there was no overall difference in fairness perceptions across the positive and negative description of COVID-19, the results point to an interaction between the magnitude of the price increase and the emotional tone of the description. Participants only found the larger price increase to be more unfair than the smaller price increase when COVID-19 was initially described in a negative tone. Presenting COVID-19 in a positive tone dampened the responsiveness to magnitude, much like what was observed in the bus scenario. While additional work is needed to identify the precise psychological mechanism behind this result, potential explanations can be found in the literature that examines connections between affective states and judgment/decision making. As described above, studies using ultimatum games have found that negative incidental emotions increase rejection rates and, therefore, intensify concerns for fairness (Andrade and Ariely, 2009; Harlé et al., 2012; Harlé and Sanfey, 2007; Liu et al., 2016; Moretti and Di Pellegrino, 2010). In the present study, the negative description of COVID-19 may be intensifying concerns for fairness via an increased sensitivity to the magnitude of the price increase. Such a link between negative affects and information sensitivity would be consistent with earlier work. Mano (1994) and Mittal and Ross (1998) link negative affect to heightened arousal during risky decision making; Forgas (1995), summarizing and integrating earlier findings in the judgment and decision-making literature, argues that positive moods induce a reliance on heuristics, while negative moods bring about thinking that is more careful and substantive. Applied to the present study, the positive description of COVID-19 might have contributed to participants being unresponsive to the magnitude of the price increase due to their thinking becoming insufficiently rigorous and/or their attention becoming insufficiently aroused. Under the negative description of COVID, in contrast, responsiveness to magnitude may have stemmed from a greater degree of deliberate cognition and/or greater attention given to the details relevant to the price increase. Although this potential interpretation of results is speculative, the pronounced difference between the effect of magnitude across positive and negative tones (across specifications 6 and 7 of Table 4, \( p = 0.122 \) for positive; \( p < 0.0005 \) for negative) points to a substantive, rather than a spurious, connection that is important to recognize independent of the mechanism.

The study’s results should also be considered in light of inflationary pressures that are expected to drive prices up following the economic response to the pandemic. Since consumers systematically underestimate the effects of inflation when assessing prices in general (Eyster et al., 2017; Kahneman et al., 1986a; Shafir et al., 1997; Shiller, 1997; Ziano et al., 2021) and when forming perceptions of a product’s price fairness (Bolton et al., 2003), the role that complex economic forces play is likely, to some degree, to be ignored or underestimated in people’s emotional responses to pandemic-driven price increases. Higher prices that are outside of the control of individual firms and municipalities may, nonetheless, be attributed to intentional markups. Given the potential for prolonged inflationary pressures as the economy recovers from the pandemic, the differential impact of price-change magnitude across positive and negative tones implies that positive COVID coverage can potentially reduce the degree to which fairness perceptions are sensitive on the margin to how much prices increase. Negative coverage, in contrast, would instead contribute to greater perceptions of unfairness as inflationary pressures become stronger.

Finally, jointly considering inflationary pressures and the context-dependent insensitivity to price-change magnitude points to potential opportunities to markup prices without public backlash in the form of greater perceived unfairness. If prices are already increasing, and if the public’s fairness perceptions are insensitive to how much prices are increasing, then firms and/or municipalities would have slack to increase prices further without leading to stronger perceptions of unfairness. The study’s results, therefore, suggest that cities and municipalities making decisions over the prices of their services are likely to confront perceptions of unfairness as inflationary pressures push prices up, but that further increases in price would not be met with strengthened perceptions of unfairness. Likewise, the results imply that, if
media portrayal shifts to more pervasive positive content relating to the pandemic, inflation would lead to a degree of perceived unfairness that might not be intensified by any markups beyond inflation.

To close, as complex modern economies respond to a disruptive pandemic, and prices increase due to countless possible sources, public sentiment will react to higher prices and decisionmakers will want to be mindful of how prices can be raised so as not to alienate stakeholders during a time of economic and social unrest. The analysis provided here provides initial evidence regarding some factors that contribute to the fairness constraints faced by retailers and municipalities coming out of the COVID-19 pandemic, and suggest that decisions regarding whether to increase prices and how much to increase prices face different context-specific constraints. Future work can identify other important factors that drive the perceived fairness of pandemic-driven price increases or illuminate potential psychological mechanisms that drive the effects identified here.

ORCID
David Chavanne https://orcid.org/0000-0002-1397-7780

REFERENCES
Anderson, E. T., and D. I. Simester. 2008. “Research Note—Does Demand Fall When Customers Perceive That Prices Are Unfair? The Case of Premium Pricing for Large Sizes.” Marketing Science 27(3): 492–500.
Andrade, E. B., and D. Ariely. 2009. “The Enduring Impact of Transient Emotions on Decision Making.” Organizational Behavior and Human Decision Processes 109(1): 1–8.
Andreoni, J. 1995. “Warm-Glow Versus Cold-Prickle: The Effects of Positive and Negative Framing on Cooperation in Experiments.” The Quarterly Journal of Economics 110(1): 1–21.
Becker, L. C. B., R. L. Lionello, M. de Brito Nagel, R. Heldt, M. S. Trombetta, and L. A. Sloengo. 2017. “Pricing Strategy in Multi-Channel Retailing and Fairness Perception: An Examination of Boundary Conditions.” Revista de Administração IMED 6(2): 162–72.
Beranek, B., R. Cubitt, and S. Gächter. 2015. “Stated and Revealed Inequality Aversion in Three Subject Pools.” Journal of the Economic Science Association 1(1): 43–58.
Berinsky, A. J., G. A. Huber, and G. S. Lenz 2012. “Evaluating Online Labor Markets for Experimental Research: Amazon. com’s Mechanical Turk.” Political Analysis 20(3):351-68.
Bolton, L. E., and J. W. Alba 2006. “Price Fairness: Good and Service Differences and The Role of Vendor Costs.” Journal of Consumer Research 33(2): 258–65.
Bolton, L. E., L. Warlop, and J. W. Alba. 2003. “Consumer Perceptions of Price (Un)Fairness.” Journal of Consumer Research 29(4): 474–91.
Buhrmester, M., T. Kwang, and S. D. Gosling. 2011. “Amazon’s Mechanical Turk: A New Source of Inexpensive, Yet High-Quality, Data.” Perspectives on Psychological Science 6(1): 3–5.
Campbell, M. C. 1999. “Perceptions of Price Unfairness: Antecedents and Consequences.” Journal of Marketing Research 36(2):187–99.
Campbell, M. C. 2007. “Says Who?! How the Source of Price Information and Affect Influence Perceived Price (Un)Fairness.” Journal of Marketing Research 44(2): 261–71.
DellaVigna, S., and E. La Ferrara. 2015. “Economic and social impacts of the media.” In Handbook of Media Economics, edited by S. Anderson, D. Strömberg, and J. Waldfogel, Vol. 1, 723–68. Amsterdam: North-Holland.
Eyster, E., K. Madarasz, and P. Michallat. 2017. “Pricing When Customers Care About Fairness But Misinfer Markups (No. w23778).” National Bureau of Economic Research. https://doi.org/10.3386/w23778.
Ferguson, J. L., and P. S. Ellen. 2013. “Transparency in Pricing and Its Effect on Perceived Price Fairness.” Journal of Product & Brand Management 22(5/6): 9.
Forgas, J. P. 1995. “Mood and Judgment: The Affect Infusion Model (AIM).” Psychological Bulletin 117(1): 39.
Friedman, E., and O. Toubia. 2022. “Pricing Fairness in a Pandemic: Navigating Unintended Changes to Value or Cost.” Journal of the Association for Consumer Research 7(1). https://doi.org/10.1086/711850.
Gamliel, E., and E. Peer. 2006. “Positive Versus Negative Framing Affects Justice Judgments.” Social Justice Research 19(3): 307–22.
Goodman, J. K., C. E. Cryder, and A. Cheema. 2013. “Data Collection in a Flat World: The Strengths and Weaknesses of Mechanical Turk samples.” Journal of Behavioral Decision Making 26(3): 213–24.
Harlé, K. M., L. J. Chang, M. van't Wout, and A. G. Sanfey 2012. “The Neural Mechanisms of Affect Infusion in Social Economic Decision-Making: A Mediating Role of the Anterior Insula.” Neuroimage 61(1): 32–40.
Harlé, K. M., and A. G. Sanfey 2007. “Incidental Sadness Biases Social Economic Decisions in the Ultimatum Game.” Emotion 7(4): 876.
Herrmann, A., L. Xia, K. B. Monroe, and F. Huber 2007. “The Influence of Price Fairness on Customer Satisfaction: An Empirical Test in the context of Automobile Purchases.” Journal of Product & Brand Management 16(1), 49–58.
Heussler, T., H. Frank, and F. Meyer 2009. “Moderating Effects of Emotion on the Perceived Fairness of Price Increases.” *ACR North American Advances* 36:332–8.

Hiscox, M. J. 2006. “Through a Glass and Darkly: Attitudes Toward International Trade and the Curious Effects of Issue Framing.” *International Organization* 60(3): 755–80.

Homburg, C., W. D. Hoyer, and N. Koschathe. 2005. “Customers’ Reactions to Price Increases: Do Customer Satisfaction and Perceived Motive Fairness Matter?” *Journal of the Academy of Marketing Science* 33(1): 36–49.

Huangfu, G., and L. Zhu. 2012. “Do Consumers’ Perceptions of Price Fairness Differ According to Type of Firm Ownership?” *Social Behavior and Personality* 40(4): 693–8.

Huppertz, J. W., S. J. Arenson, and R. H. Evans. 1978. “An Application of Equity Theory to Buyer–Seller Exchange Situations.” *Journal of Marketing Research* 15(2): 250–60.

Jin, J., W. Zhang, and M. Chen. 2017. “How Consumers Are Affected by Product Descriptions in Online Shopping: Event-Related Potentials Evidence of the Attribute Framing Effect.” *Neuroscience Research* 125: 21–28.

Johnson, D., and J. B. Ryan. 2020. “Amazon Mechanical Turk Workers Can Provide Consistent and Economically Meaningful Data.” *Southern Economic Journal* 87(1): 369–85.

Kahneman, D., J. L. Knetsch, and R. H. Thaler 1986b. “Fairness and the Assumptions of Economics.” *Journal of Business* 59(4): S285–300.

Kahneman, D., J. L. Knetsch, and R. Thaler. 1986a. “Fairness as a Constraint on Profit Seeking: Entitlements in the Market.” *The American Economic Review* 76(4): 728–41.

Konuk, F. A. 2018. “Price Fairness, Satisfaction, and Trust as Antecedents of Purchase Intentions Towards Organic Food.” *Journal of Consumer Behaviour* 17(2): 141–8.

Lempert, K. M., and E. A. Phelps. 2016. “The Malleability of Intertemporal Choice.” *Trends in Cognitive Sciences* 20(1): 64–74.

Lerner, J. S., D. A. Small, and G. Loewenstein. 2004. “Heart Strings and Purse Strings: Carryover Effects of Emotions on Economic Decisions.” *Psychological Science* 15(5): 337–41.

Levin, I. P., and G. J. Gaeth. 1988. “How Consumers Are Affected by the Framing of Attribute Information Before and After Consuming the Product.” *Journal of Consumer Research* 15(3): 374–8.

Liu, C., J. W. Chai, and R. Yu. 2016. “Negative Emotional Incidents Augment Fairness Sensitivity.” *Scientific Reports* 6(1): 1–8.

Luo, S., G. Ansle, and J. Monterosso. 2014. “The Behavioral and Neural Effect of Emotional Primes on Intertemporal Decisions.” *Social Cognitive and Affective Neuroscience* 9(3): 283–91.

Malec, D., A. Selinšek, J. Dlačić, and B. Milčefner. 2020. “Exploring the Emotional Side of Price Fairness Perceptions and Its Consequences.” *Economic Research-Ekonomska Istraživanja* 34(1): 1931–48.

Mano, H. 1994. “Risk-Taking, Framing Effects, and Affect.” *Organizational Behavior and Human Decision Processes* 57(1): 38–58.

Martin, W. C., N. Ponder, and J. E. Lueg. 2009. “Price Fairness Perceptions and Customer Loyalty in a Retail Context.” *Journal of Business Research* 62(6): 588–93.

Martín-Ruiz, D., and F. J. Rondán-Cataluña. 2008. “The Nature and Consequences of Price Unfairness in Services: A Comparison to Tangible Goods.” *International Journal of Service Industry Management* 19(3): 325–52.

Mason, W., and S. Suri. 2012. “Conducting Behavioral Research on Amazon’s Mechanical Turk.” *Behavior Research Methods* 44(1): 1–23.

Maxwell, S. 2002. “Rule-Based Price Fairness and Its Effect on Willingness to Purchase.” *Journal of Economic Psychology* 23(2): 191–212.

Mittal, V., and W. T. Ross Jr. 1998. “The Impact of Positive and Negative Affect and Issue Framing on Issue Interpretation and Risk Taking.” *Organizational Behavior and Human Decision Processes* 76(3): 298–324.

Moretti, L., and G. Di Pellegrino. 2010. “Disgust Selectively Modulates Reciprocal Fairness in Economic Interactions.” *Emotion* 10(2): 169.

O’Neill, R. M., and D. R. Lambert. 2001. “The Emotional Side of Price.” *Psychology & Marketing* 18(3): 217–37.

Paolacci, G., J. Chandler, and P. G. Ipeirotis. 2010. “Running Experiments on Amazon Mechanical Turk.” *Judgment and Decision Making* 5(5): 411–9.

Sacerdote, B., R. Sehgal, and M. Cook. 2020. “Why Is All COVID-19 News Bad News? (No. w28110).” *National Bureau of Economic Research.*

Shafir, E., P. Diamond, and A. Tversky. 1997. “Money Illusion.” *The Quarterly Journal of Economics* 112(2): 341–74.

Shiller, Robert J. 1997. “Why Do People Dislike Inflation?” In Reducing Inflation: Motivation and Strategy, edited by Christina D. Romer and David H. Romer, chap. 1. Chicago: University of Chicago Press.

Sonnenbend, H. 2016. “Fairness Constraints on Profit-Seeking: Evidence From the German Club Concert Industry.” *Journal of Cultural Economics* 40(4): 529–45.

Tarrab, F., M. Eisend, and F. Dost. 2016. “A Meta-Analysis of Price Change Fairness Perceptions.” *International Journal of Research in Marketing* 33(1): 199–203.

Tversky, A., and D. Kahneman. 1986. “Rational Choice and the Framing of Decisions.” *The Journal of Business* 59(4): 251–78.

Vaidyanathan, R., and P. Aggarwal. 2003. “Who Is the Fairest of Them All? An Attributional Approach to Price Fairness Perceptions.” *Journal of Business Research* 56(6): 453–63.

Xia, L., K. Monroe, and J. Cox. 2004. “The Price Is Unfair! A Conceptual Framework of Price Fairness Perceptions.” *Journal of Marketing* 68(4): 1–15.

Yang, Q., S. Zhou, R. Gu, and Y. Wu. 2020. “How Do Different Kinds of Incidental Emotions Influence Risk Decision Making?” *Biological Psychology* 154: 107920.
Yang, Y., H. S. Solgaard, and J. Ren. 2018. “Does Positive Framing Matter? An Investigation of How Framing Affects Consumers’ Willingness to Buy Green Electricity in Denmark.” *Energy Research & Social Science* 46: 40–47.

Yen, Y. S. 2019. Exploring the Synergy Effect of Trust with Other Beliefs in Television Shopping. *Management Decision* 58(3): 428–47.

Zhao, D., R. Gu, P. Tang, Q. Yang, and Y. J. Luo. 2016. “Incidental Emotions Influence Risk Preference and Outcome Evaluation.” *Psychophysiology* 53(10): 1542–51.

Ziano, I., J. Li, S. M. Tsun, H. C. Lei, A. A. Kamath, B. L. Cheng, and G. Feldman. 2021. “Revisiting ‘Money Illusion’: Replication and Extension of Shafir, Diamond, and Tversky (1997).” *Journal of Economic Psychology* 83: 102349.

**SUPPORTING INFORMATION**

Additional supporting information may be found in the online version of the article at the publisher's website.

**How to cite this article:** Chavanne, D., Z. Danz, J. Dribssa, R. Powell, and M. Sambor. “Context and the Perceived Fairness of Price Increases Coming Out of COVID-19.” *Social Science Quarterly*. 2022;103: 55–68. [https://doi.org/10.1111/ssqu.13121](https://doi.org/10.1111/ssqu.13121)