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Frontiers: Shrinkflation Aversion: When and Why Product Size Decreases Are Seen as More Unfair than Equivalent Price Increases

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Abstract. Consumers worldwide have been struggling to keep up with rising costs of living. Although many firms have (directly) increased their prices, others have engaged in the practice of product downsizing—decreasing the size or quantity of the product without changing its price. In this research, I investigate consumers’ beliefs about the fairness of product downsizing compared with equivalent price increases (i.e., holding the price per unit of product constant). Five preregistered experiments demonstrate that, whereas the vast majority of people judge price increases in response to cost increases as fair, this pattern is attenuated—or even reversed—for product downsizing. Consequently, the proportion of consumers who view product downsizing as unfair is greater than the proportion who view an equivalent price increase as unfair. This phenomenon, referred to as “shrinkflation aversion,” is predominantly driven by consumers’ beliefs that product downsizing (versus price increases) is a deceptive practice. Importantly, I provide empirical evidence for two key moderators of the phenomenon: (1) the transparency of the product change and (2) the presence (versus absence) of increases in the firm’s costs.

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1. Introduction

In recent months, consumers worldwide have struggled to keep up with rising costs of living fueled by supply-demand imbalances in food, energy, and housing. In the United States, inflation was the single most important concern for voters in the recent midterm elections (Iacurci 2022). Exorbitant inflation rates are threatening consumers’ efforts to maintain their standards of living not only in the United States, but also in Europe (Cohen 2022), Asia (Tan 2022), Africa (Bolhuis and Kovacs 2022), and pretty much the rest of the world.

For firms, the current economic environment poses a seemingly insurmountable challenge. On one hand, they need to take action to deal with steep increases in production and operating costs that have taken a toll on their profitability. On the other hand, they need to tread carefully, by reacting to increases in costs without upsetting consumers. Interestingly, a large number of firms have refrained from increasing their prices in order to deal with rising costs. Rather, they are increasingly engaging in a different practice, which pundits commonly refer to as “shrinkflation” (*The Business Times* 2021, Butler and Avery 2022).

Shrinkflation refers to product downsizing—decreasing the size or quantity of the product without changing its price. Cookies are becoming smaller, potato chip bags have more air, and toilet paper rolls are slimming down. Oftentimes, consumers are unlikely to notice such changes. Indeed, classic research in psychology and psychophysics notes that people’s perception of an object’s size can deviate from said object’s true size (Boring 1946, Hastorf 1950, Schlosberg 1950, Gilinsky 1951). Further, people may fail to notice changes in an object’s size, such as a decrease in product size. This may be particularly true when the change in size is small relative to the reference (i.e., starting) point, such that it lies below our perceptual threshold for detecting a given change (Weber 1834, Treisman 1964, Evangelidis 2022). Further, people may attend to changes on a given dimension (e.g., the product’s height) relatively more (Piaget 1969, Krider et al. 2001), and they tend to underestimate a change in a product’s size when the change occurs on multiple dimensions, such as when the height, width, and length of the packaging all change at the same time (Chandon and Ordabayeva 2009). These biases in people’s perceptions of size are often exploited by firms

when the latter downsize their products in the hopes of consumers not noticing—or underestimating the magnitude of—the change.

As such, it appears that shrinkflation may be a more effective way to protect profits compared with traditional price increases, a tenet that is supported by research showing that consumer demand may be less sensitive to changes in product size than changes in price (Gourville and Koehler 2004, Çakır and Balagtas 2014, Yao et al. 2020, Kim 2024; although there is inconsistent evidence in Imai and Watanabe 2014). Nonetheless, consumers are becoming increasingly aware of, but also worried about, the prevalence of this phenomenon. In a recent survey in the United States, more than 6 out of 10 consumers were worried about shrinkflation (Moquin 2022). Further, consumers are actively participating in communities that document and discuss cases of shrinkflation (Reddit 2023).

Inspired by the increasing prevalence of the phenomenon, in this paper, I investigate consumers' beliefs about fairness, particularly the extent to which product downsizing is considered a fair practice compared with equivalent price increases that lead to the same price per unit of product. Prior academic literature notes that fairness has a central role in our economy, setting the boundaries for what actions firms can and cannot do when faced with changes in their cost structure (Kahneman et al. 1986, Rabin 1993, Bolton et al. 2003, Xia et al. 2004, Cui et al. 2007). Prior research, particularly the seminal work by Kahneman et al. (1986), has demonstrated that consumers judge price increases to be fair when firm's reference profits are threatened, such as when production costs increase. This article aims to extend the influential research of Kahneman et al. by examining consumers' fairness judgments regarding product downsizing compared with price increases when firms' reference profits are threatened.

Through this exploration, this study endeavors to make three main contributions to existing literature. Firstly, it holds the potential to uncover asymmetries in consumers' judgments of fairness concerning changes in a product's size, as opposed to its price. This could suggest that theories of fairness may need to distinguish between deviations from reference prices and reference sizes when assessing deviations from reference transactions. Secondly, prior research on product downsizing has primarily investigated how consumer demand responds to product downsizing relative to price increases. This paper contributes to that literature by examining another criterion variable: fairness perceptions. This investigation is important because it can yield distinct insights into consumers' attitudes toward product downsizing. For instance, upon observing that consumer demand is less sensitive to product downsizing relative to price increases, Kim (2024) concluded that consumers may actually prefer products becoming

smaller over having their prices raised. However, my research suggests that consumers are more averse to product downsizing compared with price increases. Thus, the prior findings showing that consumer demand is less sensitive to product downsizing than to price increases likely stem from consumers' reduced ability to detect and react to changes in product size as opposed to price changes, rather than from a genuine preference for product downsizing over price increases. Thirdly, in addition to comparing the perceived fairness of product downsizing and price increases, this research delves into consumers' cognitive processes concerning product downsizing. In doing so, it aims to uncover the reasons why consumers may perceive product downsizing differently than price increases.

2. Consumers' Beliefs About Product Downsizing

Kahneman et al. (1986) established *reference transaction* as a central concept when assessing the fairness of an action. A reference transaction is a precedent that serves as the reference point when judging whether a given action is fair. In the context of consumer purchases, Kahneman et al. note that a reference transaction is characterized by a reference price and by a positive reference profit for the firm. Building on this conceptualization, one could further introduce a reference product size or quantity. For example, if consumers previously bought a 52-oz. bottle of orange juice for \$4, then the reference price is \$4 and the reference quantity is 52 oz. By this view, Kahneman et al. illustrated that people concur that consumers are entitled to the terms of the reference transaction, while firms are entitled to the reference profit. When the reference profit is threatened, such as when costs increase, the firm may set new terms to protect its profit at consumers' expense. In the studies of Kahneman et al., participants did not typically object to (i.e., judge as unfair) price increases that followed increases in costs. That is, most participants endorsed the fairness of passing cost increases to consumers.

Importantly, when faced with cost increases, firms may protect their reference profits in two ways: by increasing the price or by decreasing the size of their product (i.e., product downsizing). In theory, holding the product's unit price constant, one may expect that the two practices—price increases and product downsizing—should be seen as equally fair, given that they represent equivalent procedures for maintaining the firms' reference profits. However, Kahneman et al. (1986) did not test this hypothesis, as their studies were focused on price increases alone. Related research by Friedman and Toubia (2022) reports that consumers may find product downgrades—lowering the quality of the product while holding the price constant—as more unfair than maintaining prices when the firm's costs

decrease. Although quality downgrades typically differ in nature from product downsizing, this finding may suggest that consumers are averse to changes in the product. As such, it is plausible that consumers will judge product downsizing to be more unfair than equivalent price increases.

Why would consumers judge product downsizing to be more unfair than an (equivalent) increase in price? There are multiple reasons why that might be the case. In this paper, I present compelling empirical evidence for one reason: consumers believe that product downsizing is more unfair than raising prices because the former is often less conspicuous, giving the impression of a deceptive practice aimed at misleading consumers. As previously discussed, consumers may have a hard time discerning changes in the product's size compared with changes in its price. In turn, upon noticing the change in product size, consumers may perceive product downsizing as more unfair than a price increase, as they might feel that the company is attempting to deceive them by selling reduced quantities of the product at the same price, without their awareness (Ferguson 2014). Note that, in my empirical investigation below, I consider and investigate additional reasons why product downsizing may be seen as unfair.

3. Empirical Overview

I investigate consumers' beliefs about shrinkflation in five preregistered experiments. Across studies, I find consistent evidence for *shrinkflation aversion*: the proportion of participants who view product downsizing as unfair is greater than the proportion who view equivalent price increases as unfair. Study 1 provides preliminary evidence for the phenomenon. Studies 2 and 3 investigate why consumers believe that product downsizing is more unfair than price increases. Both studies provide converging evidence that shrinkflation aversion is predominantly driven by consumers' beliefs that product downsizing (versus price increases) is a deceptive practice because consumers are unlikely to notice it. Studies 4 and 5 moderate shrinkflation aversion. Study 4 shows that shrinkflation aversion is eliminated when product changes are made transparent, such as when the firm explicitly communicates those changes to consumers. Study 5 shows that the difference in fairness judgments between product downsizing and price increases is larger in magnitude when the firm faces increases in costs (versus when costs have not increased).

Akin to Kahneman et al., Studies 1–5 feature scenarios in which a firm makes decisions that entail changes in the size or price of its products, hence affecting the outcomes of its customers. Participants read those scenarios and evaluate the fairness of the action. For robustness, the studies use two different versions of the dependent measure. Akin to Kahneman et al. (1986), participants in

Study 1 are asked to choose whether the change is acceptable versus unfair. Participants in Studies 2–5 choose whether the change is fair versus unfair. Note that all studies feature low-cost consumer packaged goods (CPGs) because consumers typically encounter shrinkflation when shopping for CPG products. Future research may wish to investigate whether the results reported here generalize to other types of goods, such as services or durables.

All studies were preregistered. There were no exclusions of participants. Data were analyzed through logistic regression models, unless noted otherwise (i.e., mediation analyses in Study 3). For Studies 1–3, the logistic models only included dummy variables of the experimental factors as predictors, whereas for Studies 4 and 5, the models additionally included interaction terms between the variables. The dependent variable was whether the change was judged to be unfair (one if yes; otherwise zero). Materials, preregistrations, data, and analyses code are available at <https://researchbox.org/1032>.

4. Study 1: Is Product Downsizing as Fair as Equivalent Price Increases?

Participants ($n = 501$; prolific) were randomly assigned to answer one of two questions about a chocolate manufacturer and an orange juice manufacturer. Participants were told that the manufacturers either increased their price or decreased the size of their products in order to face increases in their production costs. Note that the two actions—price increase and product downsizing—in each scenario are equivalent, such that they result in the same price per unit (or quantity) of product. Participants judged whether the firm's action was acceptable versus unfair:

Study 1 ($n = 501$)

Chocolate Manufacturer—Price Increase ($n = 251$)

Production costs for a chocolate manufacturer have recently increased. As a result, the firm decided to increase the price of its product from \$4 to \$5. The size of the product will remain the same (10 oz). This is

-acceptable [69.3%]

-unfair [30.7%]

Chocolate Manufacturer—Product Downsizing ($n = 250$)

Production costs for a chocolate manufacturer have recently increased. As a result, the firm decided to decrease the size of its product from 10 oz to 8 oz. The price of the product will remain the same (\$4). This is

-acceptable [55.6%]

-unfair [44.4%]

Orange Juice Manufacturer – Price Increase ($n = 251$)

Production costs for an orange juice manufacturer have recently increased. As a result, the firm decided

to increase the price of its product from \$5 to \$6. The size of the product will remain the same (50 fl oz). This is

-acceptable [73.3%]

-unfair [26.7%]

Orange Juice Manufacturer – Product Downsizing
(*n* = 250)

Production costs for an orange juice manufacturer have recently increased. As a result, the firm decided to decrease the size of its product from 50 fl oz to 42 fl oz. The price of the product will remain the same (\$5). This is

-acceptable [54%]

-unfair [46%]

There was evidence of shrinkflation aversion: the proportion of participants who perceived product downsizing as an unfair practice was much higher than that of an equivalent price increase in both scenarios (chocolate: 44.4% versus 30.7%, $z = 3.158$, $p = 0.002$; orange juice manufacturer: 46% versus 26.7%, $z = 4.451$, $p < 0.001$). These findings highlight an important asymmetry in deviations from a reference transaction. When faced with cost increases, deviations from a reference price are seen as much more acceptable than deviations from a reference size, even when both lead to the same price per unit of product. Thus, consumers seem to be averse to the practice of shrinkflation. Study S1 in the online appendix replicates these results using a within-subjects design, where the same consumers jointly evaluate and respond to price increases and product downsizing. Therefore, data of Study S1 suggest that consumers may actually prefer paying higher prices over purchasing downsized products when it is clear that both lead to equivalent unit costs (cf. Kim 2024).

5. Studies 2 and 3: Process Evidence

Study 1 presented initial evidence supporting the core finding that consumers perceive product downsizing as less fair than equivalent price increases. To further explore this phenomenon, Studies 2 and 3 delve into the underlying reasons behind consumers' tendency to deem product downsizing as more unfair than price increases.

Participants in Study 2 were randomly assigned to one of two conditions of a scenario about a potato chips manufacturer:

Study 2 (*n* = 301; prolific)

Price Increase (*n* = 152)

Production costs for a potato chips manufacturer have recently increased. As a result, the firm decided to increase the price of its product from \$3 to \$4. The size of the product will remain the same (12 oz). This is

-fair [59.2%]

-unfair [40.8%]

Product Downsizing (*n* = 149)

Production costs for a potato chips manufacturer have recently increased. As a result, the firm decided to decrease the size of its product from 12 oz to 9 oz. The price of the product will remain the same (\$3). This is

-fair [40.3%]

-unfair [59.7%]

First, I replicated the results of Study 1. The proportion of participants who judged product downsizing (versus increasing prices) to be unfair was significantly higher (59.7% versus 40.8%, $z = 3.266$, $p = 0.001$).

Importantly, participants who indicated that the change they encountered—either product downsizing or the increase in price—was unfair were additionally asked to provide an explanation (“Why do you think that this is unfair?”). Participants typed an explanation in their own words in an open-ended box.

Two independent coders that were blind to the hypotheses coded participants' explanations using two binary variables (1 = yes, 0 = no): (1) whether the participant expressed the belief that the change is unfair because it is deceptive/devious/dishonest/misleading/sneaky (e.g., because the consumer is unlikely to notice the change/the change is not transparent); or (2) whether the participant expressed the belief that the change is unfair because it would force consumers to buy more units of the product to get the quantity that they need. Coders were instructed to create additional variables for other explanations that were commonly occurring in the data (i.e., specified as those provided by more than five respondents). Variables were not mutually exclusive. Disagreements in coding were solved upon discussion between the two coders.

The coders identified two additional explanations: (3) whether the participant simply thought the size of the price increase or size decrease was too much; and (4) whether participants explicitly mentioned shrinkflation, which implied that the action was dishonest. Because explanation (4) above largely overlapped with explanation (1) (i.e., there were only eight cases coded as evidence for explanation (4), seven of which were also coded as evidence for explanation (1)), explanation (4) will not be considered further.

Table 1 provides frequency information about participants' explanations. Note that all the explanations provided by participants are available in the data file of Study 2. Consistent with my hypotheses, numerous participants stated that product downsizing is a deceptive practice (28.1%), whereas that was not the case when price increased (3.2%). Further, some participants expressed the view that they will need to buy more units of the product to get the quantity that they need when

Table 1. Participants' Explanations (Study 2)

Explanation	Percent in price increase condition (%)	Percent in product downsizing condition (%)	Examples
(1) Change is deceptive (e.g., because consumers are unlikely to notice it).	3.2	28.1	"It is clearer to increase the price rather than reduce the package size. It is deceptive." "I think shrinkflation is a lot harder to detect than a price increase, so it is a bit deceptive to consumers." "It would be more honest to increase the price rather than decrease the size. Consumers may not realise that the size of the packet has decreased, which is why it is unfair. I don't suppose the manufacturers would have a big label saying 'New packet - now with 25% fewer chips!'"
(2) The change would force consumers to buy more units of the product to get the quantity that they need.	0	5.6	"Because shrinkflation is not a good option for very many people and the manufacturers shouldn't do it. It messes up people's dietary planning and purchase planning to lose product weight from packets, especially as the shrinkflation is often hidden by not reducing the size of the box. It's better to be honest and charge more." "I think you should charge more but keep the size of the portion the same. I might be hungry man." "To get the same amount as I would have had before (12 oz), I'll need to buy two units (2 × 9 oz). So actually this makes it significantly more expensive."
(3) The change is too big.	67.7	19.1	"That is a reduction of 25%. It is far too much in one go." "It's the hike in price. You can't nearly double the price of something so quickly." "It's a big increase for no improvement."

product size decreased (5.6%). Finally, many participants expressed the belief that the change was too big, and this was more commonly the case when price increased (67.7%), compared with when the size of the product decreased (19.1%).

Whereas Study 2 was exploratory in nature, Study 3 provides confirmatory evidence for the findings of Study 2. Specifically, Study 3 participants were provided with a scenario about a manufacturer of facial tissues:

Study 3 ($n = 1,000$; prolific)

Price Increase ($n = 500$)

Production costs for a manufacturer of facial tissues have recently increased. As a result, the firm decided to increase the price of its product from \$6 to \$7.5. The size of the product will remain the same (160 sheets). This is

-fair [50%]

-unfair [50%]

Product Downsizing ($n = 500$)

Production costs for a manufacturer of facial tissues have recently increased. As a result, the firm decided to decrease the size of its product from 160 sheets to 128 sheets. The price of the product will remain the same (\$6). This is

-fair [35.4%]

-unfair [64.6%]

Participants judged the fairness of the firm's action and indicated their level of agreement (1 = strongly

disagree, 7 = strongly agree) with three statements that were based on the explanations provided by participants in Study 2 (see Table 2). Note that the order of the measures was randomized.

Replicating previous findings, a significantly higher proportion of participants perceived product downsizing as unfair compared with an equivalent price increase (64.6% versus 50%, $z = 4.681$, $p < 0.001$). Importantly, corroborating the findings of Study 2, the data suggest that the effect of product downsizing (versus price increase) on fairness judgments is explained by consumers' beliefs that product downsizing is a deceptive practice because consumers are unlikely to notice the change in the product's size. All other indirect effect were not significant.

Finally, another alternative account of the phenomenon pertains to the alignability of the firm's action with increases in costs (Bolton and Alba 2006). Consumers may believe that increasing the product's price is more fair than decreasing its size because the former is more alignable with an increase in production costs (because both involve an increase). For instance, if the firm faces a decrease in raw materials supplied by vendors rather than production cost increases, fairness judgments based on alignability might lead consumers to view product downsizing as a fairer response than raising prices. Study S2 in the online appendix provides evidence against this hypothesis. Participants in Study S2 were equally averse to product downsizing, judging it to be more unfair than an equivalent price increase, irrespective of whether the

Table 2. Results of Study 3: Mediators

Mediators (M)	Price increase condition mean (SD)	Product downsizing condition mean (SD)	Path a (SE): X → M	Path b (SE): M → Y	Indirect effect (CIs)
(1) This change is deceptive because consumers are unlikely to notice it.	2.92 (1.79)	5.23 (1.65)	2.32 (0.11)***	0.23 (0.06)***	0.53 (0.28, 0.81)
(2) This change would force consumers to buy more units of the product to get the quantity that they need.	2.34 (1.81)	5.53 (1.59)	3.19 (0.11)***	0.04 (0.05)	0.14 (−0.23, 0.50)
(3) This change is too big.	4.88 (1.71)	4.81 (1.66)	−0.06 (0.11)	1.02 (0.07)***	−0.06 (−0.28, 0.16)

Notes. Coding: X (1 = product downsizing condition, 0 = price increase condition); M (1 = strongly disagree, 7 = strongly agree); Y (1 = unfair, 0 = fair). CI, 95% confidence intervals. Mediators were simultaneously considered in a parallel mediation analysis with three mediators (Hayes 2022). Indirect effects in bold are consistent with the main (overall) effect of X on Y.
*** $p < 0.001$.

reason underlying the firm’s action was an increase in costs versus a decrease in raw materials.

6. Study 4: Transparency of Changes Moderates Shrinkflation Aversion

Previous studies showed that consumers judge firms’ decisions to respond to increases in costs through product downsizing as more unfair than decisions involving equivalent price increases. According to Study 3, this result is largely explained by consumers’ beliefs that downsizing is a deceptive practice because it is more difficult for consumers to notice the change in the product’s size (versus price). Building on these insights, Study 4 attempts to moderate shrinkflation aversion by manipulating the transparency of the change. Presumably, the asymmetry in fairness judgments between product downsizing and price increases should be attenuated when the changes are transparent, such as when the firm explicitly communicates the changes to consumers. This proposition is in line with Ferguson (2014), who argued that sellers should consider disclosing product shrinkage to consumers prior to implementation, in order to mitigate perceptions of unfairness.

To test this hypothesis, consumers ($n = 4,010$; prolific) were randomly assigned to one of four conditions of a scenario about a detergent manufacturer:

Study 4 ($n = 4,010$)

Low Transparency—Price Increase ($n = 1,004$)

Production costs for a detergent manufacturer recently increased. A few days ago, the manufacturer increased the price of its product from \$16 to \$19. The net weight of the product remained the same (140 fl oz). This is

- fair [47%]
- unfair [53%]

Low Transparency—Product Downsizing ($n = 1,004$)

Production costs for a detergent manufacturer recently increased. A few days ago, the manufacturer decreased the net weight of its product from 140 fl oz to 118 fl

oz. The price of the product remained the same (\$16). This is

- fair [30.7%]
- unfair [69.3%]

High Transparency—Price Increase ($n = 1,000$)

Production costs for a detergent manufacturer recently increased. A few days ago, the manufacturer increased the price of its product from \$16 to \$19. The net weight of the product remained the same (140 fl oz). The firm explicitly communicates the change in the price of its product to consumers on the packaging (the packaging states: “\$19, 140 fl oz; previously \$16, 140 fl oz”). This is

- fair [64.6%]
- unfair [35.4%]

High Transparency—Product Downsizing ($n = 1,002$)

Production costs for a detergent manufacturer recently increased. A few days ago, the manufacturer decreased the net weight of its product from 140 fl oz to 118 fl oz. The price of the product remained the same (\$16). The firm explicitly communicates the change in the size of its product to consumers on the packaging (the packaging states: “\$16, 118 fl oz; previously \$16, 140 fl oz”). This is

- fair [63.1%]
- unfair [36.9%]

Replicating previous findings, when transparency was low, participants judged the firm’s decision to decrease the size of its product as more unfair than the decision to increase the price of the product (69.3% versus 53%, $z = 7.465$, $p < 0.001$). Importantly, consistent with the theoretical account, this result was eliminated when the firm explicitly communicated the changes to consumers (i.e., high transparency: 36.9% versus 35.4%, $z = 0.711$, $p = 0.477$; interaction: $z = -4.780$, $p < 0.001$). Thus, product downsizing is judged as more unfair than equivalent price increases only to the extent that the change is not transparent. Increasing the transparency of

the change allows product downsizing to be viewed as equally fair to raising the product's price.

7. Study 5: Changes in Costs as Another Moderator of Shrinkflation Aversion

Study 5 examines whether the asymmetry between product downsizing and price increases is attenuated when both actions come across as attempts to increase profits, such as when the firm is not facing an increase in costs. That is, when the firm's costs have not increased, consumers should judge that neither action is permissible, hence leading to an attenuation of the effect. Therefore, the occurrence of changes in the firm's costs may act as a boundary condition of the phenomenon.

To test this hypothesis, consumers ($n = 1,202$; prolific) were randomly assigned to one of four conditions of a scenario about a potato chips manufacturer:

Study 5 ($n = 1,202$)

Costs Increased—Price Increase ($n = 301$)

Costs for a potato chips manufacturer have increased. As a result, the manufacturer decided to increase the price of its product from \$3 to \$4. The size of the product remained the same (12 oz). This is

- fair [62.8%]
- unfair [37.2%]

Costs Increased—Product Downsizing ($n = 300$)

Costs for a potato chips manufacturer have increased. As a result, the manufacturer decided to decrease the size of its product from 12 oz to 9 oz. The price of the product remained the same (\$3). This is

- fair [37%]
- unfair [63%]

Same Costs—Price Increase ($n = 301$)

Costs for a potato chips manufacturer have not increased. However, the manufacturer decided to increase the price of its product from \$3 to \$4. The size of the product remained the same (12 oz). This is

- fair [20.9%]
- unfair [79.1%]

Same Costs—Product Downsizing ($n = 300$)

Costs for a potato chips manufacturer have not increased. However, the manufacturer decided to decrease the size of its product from 12 oz to 9 oz. The price of the product remained the same (\$3). This is

- fair [14%]
- unfair [86%]

Replicating previous findings, when costs increased, participants judged the firm's decision to decrease the

size of its product as more unfair than the decision to increase the price of the product (63% versus 37.2%, $z = 6.250$, $p < 0.001$). Importantly, consistent with my hypothesis, this result was attenuated when the firm's costs had not increased (86% versus 79.1%, $z = 2.225$, $p = 0.026$; interaction: $z = -2.061$, $p = 0.039$). Thus, when the firm is not experiencing an increase in costs, both product downsizing and raising prices are considered impermissible, resulting in a reduction of the disparity in fairness perceptions between product downsizing and price increases.

8. General Discussion

Fairness has a central role in modern societies because it sets the boundaries for what actions firms can and cannot do when faced with changes in their cost structure. The seminal research by Kahneman et al. (1986) previously investigated consumers' fairness perceptions regarding price increases. Building on the seminal work by Kahneman et al., the present research investigated consumers' fairness perceptions regarding product downsizing compared with equivalent price increases.

In doing so, this article identified an important asymmetry in community standards of fairness related to deviations from reference transactions. Although the vast majority of consumers judge price increases in response to rising costs as fair, the same is not true for product downsizing. That is, the proportion of consumers who judge product downsizing as a fair practice is much lower than the proportion of consumers who judge equivalent price increases as fair (Studies 1–5). This phenomenon, referred to as “shrinkflation aversion,” is largely driven by consumers' beliefs that, unlike raising prices, product downsizing is a deceptive practice because consumers are unlikely to notice changes in size (Studies 2 and 3). Importantly, shrinkflation aversion is eliminated when the product changes are transparent, such as when the firm explicitly communicates the changes to consumers on the product's packaging (Study 4). Finally, the disparity in fairness judgments is attenuated when the firm does not face an increase in costs, in which case both product downsizing and increasing the product's price are seen as impermissible by consumers (Study 5).

The present findings have important implications for theories of fairness. Kahneman et al. established that, when the firm's reference profit is threatened, such as when costs increase, the firm may set new terms aimed at protecting its profit at consumers' expense. In theory, the firm may protect its reference profits in two ways: by increasing the price or by decreasing the size of its product. Holding the unit price of the product constant, one may expect that the two practices—price increases and product downsizing—should be seen as equally fair, given that both represent equivalent procedures for maintaining the firm's reference profit. My data show, however, that consumers do not share this view.

Therefore, this research has two important implications for theories of fairness. First, the present findings highlight an important asymmetry in deviations from a reference transaction. When faced with cost increases, deviations from a reference size are seen as much more unfair than deviations from a reference price, even when both lead to the same price per unit. This finding suggests that community standards—and theories—of fairness ought to distinguish between deviations from reference prices and reference sizes. Second, in Kahneman et al. (1986), fairness judgments are assumed to be a function of changes in the firm's cost structure and shifts in demand, irrespective of how changes are implemented. However, my data suggest that the transparency of the change is a critical factor affecting fairness judgments, which was hitherto unexplored in prior research. Study 4 demonstrated that, when the changes are more transparent, consumers judge both price increases and product downsizing to be more fair. Thus, my data suggest that theories of fairness ought to incorporate transparency as a key driver of fairness judgments.

Further, these findings have important implications for firms and policy makers. For firms, the data suggest that neither raising prices nor downsizing products are permissible when firms are not experiencing cost increases. However, when firms are experiencing increases in their costs, it may be more preferable for them to opt for increasing prices rather than resorting to product downsizing. This preference arises, of course, based on the underlying assumption that firms are concerned about how they are perceived in terms of fairness. Overall, my data show that consumers may be particularly averse to product downsizing as a practice, especially when compared with raising prices. Thus, if the firm is concerned about consumers' perceptions of fairness, it may be more advisable to increase the price than to decrease the size of the product. Importantly, if the firm really wishes to engage in product downsizing, my data suggest that making the change transparent, such as by explicitly communicating the change to consumers (e.g., on the product's packaging), can increase consumers' acceptance of product downsizing.

For policy makers, the present findings suggest that there may be a need to closely monitor product downsizing. In light of the fact that a substantial proportion of consumers perceive product downsizing to be an unfair and deceptive practice, it may be necessary to protect consumers by imposing restrictions on downsizing or, at the very least, by increasing the transparency of downsizing practices. Indeed, the issue of protecting consumers against shrinkflation was recently raised for discussion in the European Parliament (Bizzotto 2022). In France, a prominent retailer introduced signs at its shelves warning consumers about shrinkflation (Hooker 2023). Further, consumers recently formed unofficial

communities on social media that document product downsizing (Reddit 2023), in an attempt to raise awareness about the issue. Policy makers could follow suit and establish platforms or bodies that formally keep track of changes in products' sizes, but also prices, as well as document downsizing practices. This could help protect consumers by providing them with accessible and reliable information about their favorite products, hence improving the quality of their consumption decisions, while simultaneously keeping firms in line on the issue of shrinkflation.

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References

- Bizzotto M (2022) 'Shrinkflation'—A deceptive marketing practice. Commission protection for consumers against the phenomenon of product downsizing. Accessed June 8, 2023, https://www.europarl.europa.eu/doceo/document/E-9-2022-002635_EN.html.
- Bolhuis M, Kovacs P (2022) Africa's inflation among region's most urgent challenges. Accessed December 22, 2022, <https://www.imf.org/en/Blogs/Articles/2022/10/20/africas-inflation-among-regions-most-urgent-challenges>.
- Bolton LE, Alba JW (2006) Price fairness: Good and service differences and the role of vendor costs. *J. Consumer Res.* 33(2):258–265.
- Bolton LE, Warlop L, Alba JW (2003) Consumer perceptions of price (un)fairness. *J. Consumer Res.* 29(4):474–491.
- Boring EG (1946) Perception of objects. *Amer. J. Phys.* 14:99–107.
- Butler P, Avery D (2022) What is shrinkflation and what does it mean for your favorite supermarket items? Accessed December 22, 2022, <https://www.cnet.com/personal-finance/what-is-shrinkflation/>.
- Çakır M, Balagtas JV (2014) Consumer response to package downsizing: Evidence from the Chicago ice cream market. *J. Retailing* 90(1):1–12.
- Chandon P, Ordabayeva N (2009) Supersize in one dimension, downsize in three dimensions: Effects of spatial dimensionality on size perceptions and preferences. *J. Marketing Res.* 46(6):739–753.
- Cohen P (2022) Inflation in Europe reaches a record 10.7% as officials face hard options. *New York Times* (October 31), <https://www.nytimes.com/2022/10/31/business/economy/eurozone-inflation-gdp.html>.
- Cui TH, Raju JS, Zhang J (2007) Fairness and channel coordination. *Management Sci.* 53(8):1303–1314.
- Evangelidis I (2022) Rapidly diminishing sensitivity and discrete sensitivity: Explaining people's sensitivity to outcomes across decisions. *J. Experiment. Psych. Gen.* 151(9):2115–2127.
- Ferguson JL (2014) Implementing price increases in turbulent economies: Pricing approaches for reducing perceptions of price unfairness. *J. Bus. Res.* 67(1):2732–2737.
- Friedman EMS, Toubia O (2022) Pricing fairness in a pandemic: Navigating unintended changes to value or cost. *J. Assoc. Consumer Res.* 7(1):89–97.
- Gilinsky AS (1951) Perceived size and distance in visual space. *Psych. Rev.* 58(6):460–482.
- Gourville JT, Koehler JJ (2004) Downsizing price increases: A greater sensitivity to price than quantity in consumer markets. Preprint, submitted June 30, <https://dx.doi.org/10.2139/ssrn.559482>.

- Hastorf AH (1950) The influence of suggestion on the relationship between stimulus size and perceived distance. *J. Psych.* 29(1): 195–217.
- Hayes AF (2022) *Introduction to Mediation, Moderation, and Conditional Process Analysis* (Guilford Press, New York).
- Hooker L (2023) France's Carrefour puts up 'shrinkflation' warning signs. Accessed October 2, 2023, <https://www.bbc.com/news/business-66809188>.
- Iacurci G (2022) Here's the inflation breakdown for October 2022—in one chart. Accessed December 22, 2022, <https://www.cnbc.com/2022/11/10/heres-the-inflation-breakdown-for-october-2022-in-one-chart.html>.
- Imai S, Watanabe T (2014) Product downsizing and hidden price increases: Evidence from Japan's deflationary period. *Asian Econom. Policy Rev.* 9(1):69–89.
- Kahneman D, Knetsch JL, Thaler R (1986) Fairness as a constraint on profit seeking: Entitlements in the market. *Amer. Econom. Rev.* 76(4):728–741.
- Kim IK (2024) Consumers' preference for downsizing over package price increases. *J. Econom. Management Strategy* 33(1):25–52.
- Krider RE, Raghubir P, Krishna A (2001) Pizzas: π or square? Psychophysical biases in area comparisons. *Marketing Sci.* 20(4): 405–425.
- Moquin E (2022) Consumers' sensitivity to 'shrinkflation' is leading them to switch food & beverage brands. Accessed December 22, 2022, <https://morningconsult.com/2022/08/29/consumer-sensitivity-to-shrinkflation/>.
- Piaget J (1969) *The Mechanisms of Perception* (Routledge, London).
- Rabin M (1993) Incorporating fairness into game theory and economics. *Amer. Econom. Rev.* 83(5):1281–1302.
- Reddit (2023) Shrinkflation: When product sizes shrink, but prices stay the same. Accessed May 30, 2023, <https://www.reddit.com/r/shrinkflation/>.
- Schlossberg H (1950) A note on depth perception, size constancy, and related topics. *Psych. Rev.* 57(5):314–317.
- Tan S-L (2022) Inflation is here to stay despite rising interest rates, Asian business leaders warn. Accessed December 22, 2022, <https://www.cnbc.com/2022/09/27/inflation-is-here-to-stay-asian-business-leaders-warn.html>.
- The Business Times* (2021) Less product, same price: Companies use 'shrinkflation' to hide price increases. Accessed October 2, 2023, <https://www.businesstimes.com.sg/companies-markets/consumer-healthcare/less-product-same-price-companies-use-shrinkflation-hide>.
- Treisman M (1964) Noise and Weber's law: The discrimination of brightness and other dimensions. *Psych. Rev.* 71(4):314–330.
- Weber EH (1834) *De Pulsu, Resorptione, Auditu et Tactu: Annotationes Anatomicae et Physiologicae, Auctore* [On Beat, Resorption, Hearing and Touch: Anatomical and Physiological Notes] (CF Koehler, San Diego, CA).
- Xia L, Monroe KB, Cox JL (2004) The price is unfair! A conceptual framework of price fairness perceptions. *J. Marketing* 68(4):1–15.
- Yao J, Oppewal H, Wang D (2020) Cheaper and smaller or more expensive and larger: How consumers respond to unit price increase tactics that simultaneously change product price and package size. *J. Acad. Marketing Sci.* 48:1075–1094.