

Consumer Response to Versioning: How Brands' Production Methods Affect Perceptions of Unfairness

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Marketers often extend product lines by offering limited-capability models that are created by removing or degrading features in existing models. This production method, called versioning, has been lauded because of its ability to increase both consumer and firm welfare. According to rational utility models, consumers weigh benefits relative to their costs in evaluating a product. So the production method should not be relevant. Anecdotal evidence suggests otherwise. Six studies show how the production method of versioning may be perceived as unfair and unethical and lead to decreased purchase intentions for the brand. Building on prior work in fairness, the studies show that this effect is driven by violations of norms and the perceived similarity between the inferior, degraded version of a product and the full-featured model offered by the brand.

The idea of Apple gratuitously removing features that would have been actually easier to leave in is downright perplexing.

The intentional software crippling stance they have taken with the iPod Touch is disturbing at best. (Readers' responses to iPod Touch review on www.engadget.com)

Product versioning, the manufacturing strategy of deliberately *subtraction* of functionality from a product, has

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been recommended by economists as a production method that benefits both firms and consumers (Deneckere and McAfee 1996; Hahn 2006; Varian 2000). Firms benefit by reducing design and production costs and by increasing profits through price discrimination when multiple configurations of a product are offered. Consumers benefit because versioning results in lower prices and makes it possible for many to gain access to products that they might otherwise not be able to afford (Shapiro and Varian 1998; Varian 2000).

Versioning is typically achieved when a firm starts with an existing product and incurs at least a small cost to produce a lower-quality or reduced-feature configuration. A frequently cited example is IBM's slower version of its Laser Printer, produced by inserting a special chip in each unit whose sole purpose was to cut printing speed in half (Deneckere and McAfee 1996).

The use of versioning in manufacturing is common in many industries and has been employed by leading global brands including Sony, BMW, Intel, Microsoft, Verizon, Motorola, Canon, Sharp, and Apple (Hahn 2006). For instance, when first released, the Sony 20-gigabyte (GB) and 60 GB PlayStation 3 consoles both had all the components needed to play high-definition Blu-ray discs. Yet, the 20 GB model would not produce a high-definition image because Sony eliminated an output connector that is necessary for the higher-quality image to play (Block 2006). The Motorola V710 phone, available through Verizon, had full

Bluetooth capability, but consumers could use only a few Bluetooth features because Verizon disabled the rest (Wu 2007). Canon's PowerShot cameras were capable of functions found in higher-priced models, including depth of field calculators and Zebra mode, but consumers could not use these features because Canon disabled them (Melanson 2007; Sorrel 2007). Similarly, Sharp offered a digital video disc (DVD) player with the option to play either American or European standard DVDs. A second model of this player, built with the same components, played only American standard discs because the button that turns on the European option was hidden by a plastic covering (McAfee 2007).

While in the past consumers were typically unaware of these manufacturing practices, the increased use of social media and information-sharing technologies enable consumers to learn about firms' manufacturing practices and disseminate this information in online communities and product-specific Internet forums. Recently, consumer advocates, bloggers, and journalists have been using less than flattering terms to describe the versioning production method, calling it "crippleware," "product sabotage," "anti-features," "defective by design," and "damaged goods." Apple faced just such a negative reaction when it introduced its iPod Touch MP3 player. Technology experts, high-tech opinion leaders, and consumers bashed Apple for intentionally "crippling" the iPod Touch, claiming that Apple had removed features that were available in its base product—the Apple iPhone (Diaz 2007; Kingsley-Hughes 2007). Similarly, technology writers and gaming enthusiasts have openly criticized Sony's crippling of the PlayStation 3 (Block 2006; Perton 2006). Consumers were so angered by Verizon's disabling of the Bluetooth features in the Motorola V710 phone that Verizon eventually paid out over \$10 million to settle a class action lawsuit (Horowitz 2005). Table 1 provides other examples of versioned products discussed in the media and consumer response.

The potential for negative consumer responses to a manufacturing process is particularly important to understand because despite potential benefits of offering consumers lower-priced alternatives, prior work has shown that factors that are not directly associated with a product's features or benefits, including aspects of a firm's costs, may affect evaluations of fairness, consumer preferences, and product choice (Buchan, Croson, and Johnson 2004; Campbell 1999; Cohen 1974, 1982; Hui et al. 2004; Kahneman, Knetsch, and Thaler 1986; Oliver and Swan 1989). Further, the majority of research examining consumer evaluations of fairness in marketing has focused on the pricing practices of firms (cf. Bolton, Warlop, and Alba 2003; Xia, Monroe, and Cox 2004). To date, there has been no research that directly explores consumers' reactions to the fairness of the processes by which firms produce products.

The purpose of this article is to explore consumers' evaluations of fairness to production processes, in particular to production by versioning. We propose that versioning leads to evaluations of unfairness because consumers perceive that a violation of norms results in their receiving a relatively

worse outcome compared to the reference transaction offered in the full-feature alternative. Drawing on research on fairness and procedural justice, we explore how consumers hold norms or expectations that manufacturers incur greater costs to produce better products. However, through versioning these norms are violated, and products with identical attributes are perceived as less fair and are less preferred compared to when they are made using other methods. In addition, we examine the role of similarity as a moderator of this effect.

In the next section we review the literature on fairness and develop hypotheses. Our primary argument is that because versioning requires greater cost to produce inferior or reduced-feature products, it violates strongly held norms about the behaviors of marketers, and this leads to evaluations of unfairness. Further, because consumers look to the firm's offer of the superior version of the product as a reference transaction, factors that reduce perceived similarity between the superior and inferior versions, even if they require further costs, will attenuate evaluations of unfairness related to versioned products. Following the next section, six studies are presented that support our hypotheses.

FAIRNESS AND SIMILARITY

If consumers were strictly rational in their evaluation of an exchange, they would consider only the outcome or benefits they receive relative to inputs they provide. However, according to transaction utility theory, when consumers evaluate an offer, they consider two separate utilities: an acquisition utility, which encompasses the material value of what is received relative to what must be exchanged, and a transaction utility, which is an evaluation of the perceived merit of the exchange itself, primarily as an evaluation of the fairness of the exchange (Thaler 1985). This dual evaluation is also found in literature on equity and justice (Adams 1965; van den Bos et al. 1997). Here individuals are thought to consider how resources are distributed by focusing both on outputs relative to inputs and on the procedure or process by which the distribution is made. As in transaction utility theory, paramount to the procedural evaluation is a perception of the fairness of the exchange (Folger 1977; Walker et al. 1974). Because perceived fairness of a transaction can affect the overall evaluation of utility, offers having identical costs and benefits may receive very different evaluations and purchase intentions (Grewal, Monroe, and Krishnan 1998; Haws and Bearden 2006).

In marketing, the majority of research on perceptions and effects of fairness has focused on evaluations of price (Anderson and Simester 2008; Bolton et al. 2003; Darke and Dahl 2003; Haws and Bearden 2006; Xia et al. 2004), with only limited research exploring fairness related to advertising (Cohen 1974, 1982), service delivery (Hui et al. 2004), negotiations (Buchan et al. 2004), and satisfaction (Oliver and Swan 1989). Although there have been some examinations of consumers' ethical evaluations in reaction to firms' behaviors, such as the exploitation of labor (cf. Cryer and Ross 1997; Ingram, Skinner, and Taylor 2005), to date

TABLE 1
EXAMPLES OF VERSIONED PRODUCTS WITH CONSUMER OR MEDIA RESPONSE

Product	Category	Description of versioning	Consumer and media response examples
Sennheiser HD555	Audio speakers	Speaker output is reduced	"Aside from the aesthetic differences [between the HD555 and HD595], the only physical difference was an additional piece of foam inside the cheaper HD555 headphones, blocking about 50% of the outside-facing vents" (http://mikebeauchamp.com/misc/sennheiser-hd-555-to-hd-595-mod/)
BMW	Automobile	Launch control function is reduced	"The US M5 does have launch control, all be it a crippled version. The Euro M5 revs to 4000RPM. . . . 1600RPM is a ripoff and not likely to change" (E60orbust, http://www.bimmerfest.com/forums/archive/index.php/t-132832.html); see also Morrison 2005)
Mazda 2	Automobile	Performance is reduced	"The Mazda 2 comes . . . with two power levels: 75 and 86 CV, the difference resulting only from the electronic programming and to present both 129 grams of CO2 per kilometer" (http://www.4rodaspt.com/2007/09/26/mazda-2.html)
Toyota Tacoma	Automobile	Alarm system is disabled	"The Keyless Entry system is installed with all of the basic components required for the Alarm . . . locate a single-pin connector and disconnect it. . . . THATS IT! A free Alarm upgrade" (Hobart 2003)
Casio fx-82es scientific calculator	Calculator	Some calculation functions are disabled	"if you own [a Casio] fx-82es . . . you can upgrade it to a fx-911es. . . . This procedure basically makes the calculator confuse itself about which model it is" (http://www.thestudentroom.co.uk/2008)
Canon EOS 300D and DR cameras	Camera	Many electronic focusing and exposure features are disabled	"Almost laughably the majority of the EOS 300D's limitations are 'programmed in,' that is they are simply software features which have been disabled" (http://www.dpreview.com/reviews/canoneos300/page22.asp)
Apple iPhone	Cell phone	Music-playing functions disabled to allow only some formats to play	"Canon DR was intentionally crippled by firmware modifications from the higher-priced model. Will Canon gradually 'uncripple' the DR via firmware upgrades?" (drray on http://forums.dpreview.com/forums/) "iHandcuffs . . . crippleware . . . Apple officially calls its own standard 'FairPlay,' but fair it is not" (Stross 2007)

Verizon v710 phone	Cell phone	Bluetooth file-moving function is disabled	"Verizon sued in class action resulting in ten million dollar settlement. One reviewer is outraged enough to announce a \$3,000 prize for the first hacker to reverse Verizon's modifications" (Horowitz 2005)
Sharp DV740U	DVD player	Ability to play PAL formatted disks is disabled	"For those that aren't aware, [the DV740U] is a DVE611 in disguise" (clayts on http://theecorefiles.yuku.com/topic/1267/Sharp-DV740U ; see also McAfee 2007)
NVIDIA GeForce	Graphics card	Some functionality and compatibility with other systems are disabled	"NVIDIA was infamous for frequently selling identical hardware in its GeForce (consumer) and Quadro (commercial) lineups, while charging 2-5 times more for Quados. . . . Now similar news has broken regarding a new model of graphics card from Advanced Micro Devices (AMD)" (Mick 2010)
Apple iPod Touch	MP3 player	Disabled calendar and other features	"Taking a line of code out of a program to make some people buy the iPhone is a dodgy and surprising move by Apple. . . . people don't get this kind of artificial crippling" (Diaz 2007)
Microsoft Windows Home Edition Intel 486SX	Operating system Processor	Internet server capability is disabled Math coprocessor is disabled	"The Home edition of Windows includes the Internet Information Server component, which can't be used unless you hack the OS" (Diaz 2007) "Intel's 486SX chip is a standard 486DX chip with the co-processor diked out (in some early versions it was present but disabled)" (http://www.catb.org/jargon/html/C/crippleware.html)
Intel Pentium G6951	Processor	Chip capability is reduced	"A common criticism has been that it's unfair to charge customers just to unlock things that a processor can already do" (Bright 2010)
Federal Express second-day shipping	Shipping service	Second-day delivery packages are held back for later delivery	"You shouldn't have to pay \$50 for a code to turn those on. . . . just another ploy to make money" (Hruska 2010) "They are sandbagging on purpose to get you to pay more money. It feels bad! . . . your items will be left sitting just to 'make up' the time you paid for. . . . I am moving my business away from them. Not right" (http://www.hypersensory.com/content/fedex-delays-packages-no-reason ; see also McAfee 2007)
Verizon/Motorola Xoom	Tablet computer	WiFi feature is disabled	"The device's WiFi will be crippled until you fork over the cash for a data subscription." "it's almost as if Verizon and Motorola WANT this thing to fail" (bloggers on stechnica.com 2011)
Sony 20 GB Play Station 3	Video game console	High-definition video feature is eliminated by elimination of output connector	"Within minutes journalists homed in on a variety of factors that placed the lower-end PS3 into contention for the dreaded . . . classification of crippled-console. . . . Sony's thought process in crippling the \$499 PS3 in this respect is positively dumbfounding" (Gerry Block, gear.ign.com 2006)

there has been no research on fairness as it relates to the processes used by firms to design and/or manufacture products. Given the rise of social media, this information is increasingly transparent and available to consumers and, as such, is an important area of inquiry.

Researchers exploring issues of pricing fairness have made significant contributions to our understanding of consumers' fairness evaluations. Specifically, in making a judgment of fairness, individuals are thought to compare a current transaction or offer to a reference transaction and employ a principle of "dual entitlement" (Kahneman et al. 1986; Xia et al. 2004). This notion argues that when evaluating an offer, consumers believe they are entitled to a price associated with some reference transaction. However, they also accept that a firm is entitled to a reference profit. So, for example, the price of gasoline along a highway may be perceived as unfair because consumers consider a reference transaction in which a lower price was paid. But the perception of unfairness may be attenuated if they consider that the price was set to cover higher costs of transporting the fuel. Thus, evaluations of fairness depend on a comparison of a current transaction or offer and a reference transaction, as well as on the details of the specific reference transactions used in the comparison.

Within this framework, fairness evaluations have been shown to be influenced by factors including the reputation of the firm (Campbell 1999), the type of cost increases that a firm may face (Bolton et al. 2003), controllability of the price increase by the seller (Vaidyanathan and Aggarwal 2003), the price-setting mechanism (Cox 2001; Grewal, Hardesty, and Iyer 2004; Haws and Bearden 2006), and the status of the customer (Darke and Dahl 2003). With respect to product versioning, two additional factors that are expected to be important in influencing perceptions of fairness are the norms related to the transaction and the perceived similarity between the inferior and superior versions of the product offered by the firm.

Violations of Norms

Consumers hold specific beliefs about the norms or rules that govern appropriate or expected behaviors by marketers (Friestad and Wright 1994; Maxwell 1999). When a firm is perceived to violate procedural norms, then evaluations of fairness may be affected (Bolton et al. 2003; Xia et al. 2004). Support for this has been found in a number of studies that specifically examine norms associated with pricing. For example, Maxwell (2002) manipulated whether prices were set using socially acceptable or unacceptable rules. Participants rated the firm as less fair and were less willing to purchase from the firm when the socially unacceptable method was used.

Of course norms themselves may be specific to situational and cultural factors and may be subject to change through time (Cox 2001). So, although it may not be a violation of norms for a hardware store to raise prices on snow shovels when faced with a spike in costs, it would be a violation of norms for the store to raise prices when a snowstorm

causes a spike in demand. Violating these norms could lead to evaluations of unfairness (Kahneman et al. 1986). Similarly, although consumers generally expect firms to offer a product at the same price to all consumers, some types of differential pricing, such as senior citizen discounts, are widely used and considered acceptable (Cox 2001; Darke and Dahl 2003; Grewal et al. 2004). In other situations the norm is that the same price should be set even when products differ in meaningful ways, such as when pricing milk with varying fat content or clothing of different sizes. Anderson and Simester (2008) examined a situation in which a price premium was added to only the largest sizes in a clothing catalog. Finding a decrease in purchase rates, they speculated that violating this norm was the cause. Further, norms may evolve as a practice becomes more common (Kahneman et al. 1986). For example, Dickson and Kalapurakal (1994) found many differences in the commonness of pricing practices across different industrial energy markets. Within these markets, fairness evaluations of the practices were correlated to how common they were. Similarly, although consumers tend to perceive differential pricing as abnormal and unfair, yield management practices in the airline and hotel industries have come into wide use and increasing acceptance (Kimes 1994; Xia et al. 2004).

With respect to manufacturing of products, versioning is a relatively new process and is unlikely to be widely understood by consumers. Thus, to the extent that consumers do hold beliefs about norms of manufacturing, they will be consistent with more traditional methods. Specifically, it is hypothesized that when a firm offers both an inferior and a superior version of a product, consumers will expect the monetary costs, time, and effort to produce the superior version to be higher than those required to produce the inferior version. Producing an inferior product through degrading violates this norm because the firm incurs a greater cost to offer a product with reduced benefit. As a result, it is hypothesized that versioning will be perceived as an unfair process and will lead to a decrease in intent to purchase compared to manufacturing methods that do not violate this norm. Finally, as in evaluations of fairness in pricing, as consumers come to learn that versioning is a common practice, it will be perceived as less unfair.

The Role of Similarity

As noted above, evaluations of fairness involve a comparison between a current offer or transaction and a reference transaction (Kahneman et al. 1986). The reference transaction that is used for comparison may arise from several possible sources including prior transactions with the firm, offers by the firm in other channels, offers to other consumers, and offers made by competitors (Bolton et al. 2003; Huang, Chang, and Chen 2005). Consumers may also simulate a relevant reference transaction based on cultural, industry, or situational norms (Folger and Kass 2000; Kahneman et al. 1986; Maxwell 1999; Xia et al. 2004).

Prior research suggests that whether or not an offer is judged to be unfair may depend, at least in part, on the

degree to which it is perceived to be similar to the salient reference transaction. Social comparison theory suggests that people are more likely to compare themselves to similar others (Festinger 1954). So awareness of a similar other receiving more advantageous terms in an exchange with a seller may lead to evaluations of unfairness, while awareness of a dissimilar other with the same terms may be less likely to be perceived as unfair (Xia et al. 2004). The opposite appears to occur when consumers consider their similarity to the seller. For example, Novoseltsev and Warlop (2002) found that evaluations of unfairness were mitigated when participants saw a seller as having socioeconomic characteristics similar to theirs.

Xia et al. (2004) proposed expanding this notion of similarity beyond actors in the exchange, arguing that any decrease in similarity between current and reference transactions should mitigate evaluations of unfairness. Haws and Bearden (2006) theorized that one reason for this relates to the representative heuristic (Tversky and Kahneman 1974), whereby similarities between an object and the properties of a category are used to judge the probability that the object belongs to the category. They reasoned that fairness judgments may likewise be made on the basis of similarity between a current and a reference transaction. Such arguments are consistent with work exploring yield management pricing, where consumers frequently pay different prices for the same services (Kambil and Agrawal 2001; Kimes 2002). These researchers have proposed that one way to reduce evaluations of unfairness is to add or restrict service elements between offerings of different prices in order to make them appear less similar.

Recent empirical work has begun to bear out the moderating role of similarity, although it is still largely explored in the area of fairness with respect to pricing strategies. For example, participants rated a department store's pricing as less fair when one could purchase the same brands at a discount store compared to when different brands were sold at each store (Bolton et al. 2003). Anderson and Simester (2008) studied the effects of demanding a price premium for clothing that exceeded a certain size. Consumers whose size was just larger than the size that required no premium were less likely to purchase from a catalog compared to consumers whose size was much larger than, and thus less similar to, the smaller sizes that levied no price premium. Finally, both Dai (2010) and Haws and Bearden (2006) explored the effects of temporal proximity on evaluations of fairness and found that more recent price changes were more influential in evaluations of unfairness than those that were less recent.

When a consumer is considering a versioned product, a reference transaction that is likely to be salient is the non-degraded version of the product. Of course, the superior product is not an identical substitute as it differs in key features and benefits. Still, having a common origin, manufacturer, and components makes it likely to be a salient reference that consumers will consider when trying to make sense of the impact of the violation of norms associated with

versioning. On the basis of the preceding analysis, we hypothesize that when firms engage in versioning, factors across the marketing mix (e.g., product design, packaging, and distribution channels) that make the configurations less similar will decrease evaluations of unfairness.

In summary, we argue that the manufacturing process of versioning involves a strong violation of norms leading to perceptions of unfairness, but these perceptions may be moderated by the dissimilarity between the inferior and superior versions of the products. Specifically, we suggest that reducing comparability of the versioned models—through observable, unobservable, spatial, or temporal differentiation—will mitigate the perceived unfairness.

In the following sections we test these hypotheses. The first two studies examine the role of norms by first measuring (study 1) and then manipulating (study 2) perceptions of norms associated with manufacturing processes. In study 1, we examine consumers' spontaneous expectations of production costs and effort and show that versioning violates these norms, consequently leading to perceptions of the brand's manufacturing method as unfair and unethical and to lower purchase intentions. In study 2, we formally manipulate these norms to show that unfairness is mitigated when versioning is perceived as a common practice. In studies 3–6, we explore the role of similarity between the versioned alternatives and show that reducing similarity between the inferior and superior versioned alternatives attenuates the negative effects. We do this by manipulating similarity through observable physical differences (the products' color in study 3) and unobservable physical differences (internal components in study 4). Finally, we manipulate similarity through spatial differences in distribution (study 5) and temporal differences in manufacturing processes (study 6).

STUDY 1: MEASURING NORM VIOLATIONS

The purpose of study 1 was to explore the role of violation of norms in perceptions of unfairness of production methods. The stimuli for study 1 are based on the actual instance of versioning in which IBM added a computer chip to a printer to create an inferior model (Deneckere and McAfee 1994). Participants evaluated a printer made by an unnamed firm that also produces a superior performance printer. We manipulate the production method and measure evaluations of unfairness and product preference. To explore norms, we also examine beliefs about production costs. We hypothesize that consumers expect that a manufacturer does not spend more per unit (in terms of monetary cost, time, or effort) to produce an inferior version of a product. That is, consumers expect greater costs for a superior version of a product even when not specifically told there are more steps, more parts, or more sophisticated technologies in the production. Further, when consumers learn that these norms have been violated by degrading a superior version, we expect lower ratings of fairness and reduced preference for the product.

Method

Seventy-six individuals recruited through the participant pool of a large university were given payment of \$3 each for being part of study 1. The study was a three-cell (described method of production: degrading, enhancing, or control) between-subjects design. All participants were provided with a purchase scenario in which they chose between two printers capable of printing 15 pages per minute (ppm), the X-15 and the Y-15 (offered by two competing brands with corresponding brand X and brand Y labels). A purported *Consumer Reports* excerpt was provided that described most printers as producing between 5 and 25 ppm. The excerpt described the target brand, brand X, as also offering a faster 24 ppm printer. The participants in the "enhancing" condition were told that "Brand X makes two printers. In addition to the X-15 that you are considering, Brand X also makes the X-24. The X-15 prints 15 pages per minute. The X-24 prints 24 pages per minute. Here is how Brand X makes the units print at different speeds: All Brand X printers start out as X-15. To make the X-24 printer takes an extra step. A completed X-15 unit is opened up. A specialized computer chip is added. Then the unit is reassembled. With this computer chip added the X-24 printer goes faster than the X-15." In the "degrading" condition the final sentences were replaced with "All Brand X printers start out as X-24. To make the X-15 printer takes an extra step. A completed X-24 unit is opened up. A specialized computer chip is added. Then the unit is reassembled. With this computer chip added the X-15 printer goes slower than the X-24." In the control condition, participants received no information about the method of production of the printers. This condition allowed for a measure of expected norms when a firm produces more than one version of a product for comparison to the other production methods.

Participants then used a 13-point scale to provide their relative likelihood of purchasing the target brand's 15 ppm printer versus the competitor's 15 ppm printer. To assess perceptions of unfairness, participants rated the manufacturing process used by the target brand using a three-item scale, with items ranging from (1) unfair to (7) fair, (1) unethical to (7) ethical, and (1) unacceptable to (7) acceptable. This measure was adopted directly from prior work on fairness as it relates to pricing (Campbell 1999). The items were reverse coded to indicate perceptions of unfairness. Finally, to examine beliefs about the costs of production, participants provided their estimates of the cost, time, and effort that the target brand expended in producing the superior versus the inferior printer using 7-point scales anchored at 1 with "the X-15 is more" and at 7 with "the X-24 is more."

Results

Norms of Costs of Production. The three measures of cost, time, and effort were averaged to create a single measure ($\alpha = .91$). One-way ANOVA revealed that the mean cost estimate differed by condition ($F(2, 73) = 10.8, p < .001$).

We expected consumers to hold a norm that firms will spend more to produce superior versions of products and not spend more to produce inferior versions. The comparison between the enhancing and the control conditions provides support for this assertion. In the enhancing condition, where information was explicitly provided, participants reported that the firm incurred more costs to produce the faster compared to the slower printer ($M = 4.7$), and this was not significantly different from that inferred in the control condition, where no information about the production method was provided ($M = 4.3; F(1, 48) = 1.6, p > .05$).

By contrast, in the disabling condition, these expectations were violated, so that participants rightly reported that it cost more to produce the worse version ($M = 3.3$), and this did differ from inferences about the costs in the control condition, that is, when no information was provided ($M = 4.3; F(1, 52) = 11.0, p < .01$).

Perceptions of Unfairness. The three unfairness measures of "unfair," "unacceptable," and "unethical" were averaged to create a single unfairness measure ($\alpha = .90$). A one-way ANOVA revealed a difference in perceptions of unfairness by condition ($F(2, 73) = 7.7, p < .01$). Between the enhancing condition ($M = 3.4$) and the control ($M = 3.3$) there was no difference in unfairness evaluations ($F(1, 48) = .04, NS$). However, in the disabled condition the manufacturing process was seen as more unfair and unethical ($M = 4.7$) compared to either the control condition ($M = 3.3; F(1, 52) = 12.4, p < .001$) or the enhancing condition ($M = 3.4; F(1, 48) = 8.6, p < .01$).

Brand Preference. Production method also influenced preference for the target printer relative to the competition ($F(2, 73) = 15.7, p < .01$). Echoing the perceptions of unfairness, there was no difference in preference between the enhancing and the no-information conditions ($M = 5.1$ in both conditions), with participants favoring the target brand in both cases. However, compared to the no-information condition ($M = 5.1$), preference for the competition increased when the target's printer was degraded ($M = 9.2; F(1, 50) = 27.0, p < .001$).

Discussion

In all conditions of study 1, participants evaluated products that had identical features and benefits, with the only differences in evaluation and preference stemming from the production method. When the target brand used a degrading process (i.e., versioning), it was perceived as more unfair and was preferred less relative to a competing product than when the firm used an enhancing process or when there was no information about how the product is manufactured.

Consistent with the argument that norms influence these evaluations of fairness in production, we found that estimates of the relative costs of production were the same whether or not specific information was provided that the superior model cost more. Following the norms of produc-

tion, participants did not differ in their ratings of fairness in these two conditions. Yet, when the firm spent more to create a worse version, there was a departure from the norm, and in this (versioning) condition, the process was considered less fair and preference was diminished.

Although the production method was manipulated in this study, only the norms were measured. This was done intentionally in order to establish participants' lay theories about costs in manufacturing processes without other information. Of course, if norms indeed play a role in evaluations of versioned products, then manipulating norms is a better way to test this. Thus, in study 2 we manipulate information about both norms and the manufacturing process.

STUDY 2: MANIPULATING NORM VIOLATIONS

The primary purpose of study 2 was to further explore the role of violation of norms in evaluations of unfairness of production methods. We manipulate whether norms associated with versioning are violated by informing participants that it is a common manufacturing practice.

As in study 1, the stimuli for study 2 were based on an actual example of versioning. In this case we modeled the stimuli on Verizon's altering of software to disable features in a cell phone (Wu 2007). By using this scenario we increase the robustness of our findings to multiple product categories as well as multiple methods of achieving versioned products, as this process does not require any physical changes (adding a computer chip) as was described in study 1.

Method

One hundred and thirty-five participants from a national online panel participated in the study. Forty-one percent of the participants were male. Ages ranged from 18 to 65 with an average of 32 years. Participants were paid a prorated equivalent of \$6 per hour for their participation.

The study used a 2 (degrading vs. separate processes) \times 2 (norm revealed vs. not revealed) design. In all conditions participants were told to imagine that they were considering the purchase of a Neptune smart phone made by brand X. The Neptune was described as having features including G3 capability, global satellite positioning, a large keyboard, text messaging, a built in 3-megapixel camera, Internet browsing, and 15 megabytes (MB) of data storage. Participants were also told that brand X makes another phone, the Jupiter, which in addition to all the features of the Neptune also included Bluetooth, video capability, and an extra 10 MB of storage space.

All participants read a purported excerpt from a popular consumer magazine. In the degrading conditions, the Neptune and Jupiter phones were described as sharing software, but in the Neptune "a few special lines of encrypted computing code are added to the phone's operating software. This makes it so that on the Neptune phone the Bluetooth, video, and extra data storage capabilities will not function."

In the different process conditions participants read that "The Neptune and Jupiter phones are manufactured with different capabilities. The Neptune has software to operate its features. The Jupiter has different software to operate its features."

To manipulate norms, information about commonness of the manufacturing method was also provided in the excerpt. In the norms revealed conditions, participants read that "according to our engineers, this method of production is actually very common in the electronics industry. Our engineers were able to give us a list of companies, including such well known brands as Apple, Sony, IBM, Toshiba, and Nikon that make many of their products in much the same way." In the nonrevealed condition, participants did not receive any comments about whether this was a common or an uncommon production method. Next participants answered questions about intent to purchase and perceptions of unfairness. First they were asked, "How might this information change your likelihood of purchasing a Neptune smart phone?" using a 7-point scale anchored at "far less likely to buy the Neptune phone" and "far more likely to buy the Neptune phone." Then participants rated the unfairness of the manufacturing method using 7-point items for unfair, unacceptable, and unethical, as in study 1.

Results

Responses for ratings of unfair, unethical, and unacceptable were combined to form a single perception of unfairness measure ($\alpha = .94$). A 2×2 ANOVA found a significant main effect of the manufacturing process ($F(1, 131) = 30.7, p < .001$). As in study 1, when the manufacturer used a degrading process, participants found it more unfair and unethical ($M = 4.6$) than when separate processes were used ($M = 3.2$). This difference was qualified by an interaction with whether or not the method was described as being a norm ($F(1, 131) = 6.3, p < .05$). In the versioning conditions, describing the method as common decreased perceptions of unfairness ($M = 4.1$) compared to when it was not described as common ($M = 5.0; F(1, 76) = 7.0, p < .01$). In the separate process conditions, there was no significant difference between when the method was described as common ($M = 3.4$) and when it was not ($M = 3.1; F(1, 55) = .9, NS$).

Purchase intentions were consistent with the perceptions of unfairness. A 2×2 ANOVA revealed a significant main effect for the manufacturing process ($F(1, 131) = 37.1, p < .001$). When the manufacturer used a degrading process, participants were less likely to purchase ($M = 2.6$) than when each model was described as having its own software ($M = 3.9$). This was qualified by an interaction with whether or not the method was described as common ($F(1, 131) = 10.3, p < .01$). In the versioning conditions, describing the method as common increased purchase intent ($M = 3.2$) compared to when it was not described as common ($M = 2.1; F(1, 76) = 15.9, p < .001$). In the nonversioning conditions, there was no significant difference between methods

when the method was described as common ($M = 3.8$) versus not ($M = 4.0$; $F(1, 55) = .5$, NS).

Discussion

Prior research on evaluations of firms' pricing suggests that a violation of norms is an important element in perceptions of fairness (Kahneman et al. 1986; Maxwell 2002). Taken together, studies 1 and 2 support the hypothesis that a violation of norms influences perceptions of unfairness associated with the manufacturing of a product. In study 1, in the degrading (versioning) condition, where norms of costs of production were violated, participants rated the process as more unfair and unethical and were less likely to purchase. In study 2, manipulating norms by having a third party inform consumers that the degrading method is common mitigated the negative evaluations of unfairness. Further, these effects were observed in two product categories (printers and cell phones) and with two methods of versioning (physical manipulation and degrading by altering software). In studies 3–6, we explore the moderating influence on fairness of perceived similarity between the superior and inferior alternatives offered by a firm.

STUDY 3: MEANINGLESS PHYSICAL DIFFERENTIATION

The purpose of study 3 was to explore the moderating effect of perceived similarity between superior and inferior versions of a product. As noted above, in the context of pricing, Xia et al. (2004) proposed that decreasing similarity between a current offer and a reference transaction would attenuate unfairness evaluations. Here we examine the effects of similarity on fairness related to manufacturing methods. In addition to manipulating manufacturing method, we also manipulate the similarity of the superior and inferior versions of the firms' products by adding a meaningless yet observable difference between the versions. In this study, participants evaluate MP3 players. Similarity between the superior and inferior versions of the MP3 players is manipulated by making the color of the exterior case either the same or different (but equally preferred). This simple cosmetic difference, although irrelevant for performance, is expected to decrease the perceived similarity between the versions, thereby attenuating unfairness ratings.

Method

Ninety individuals from the participant pool of a large private university were each paid \$3 for participation in this 2 (method of production: enhancing vs. versioning) \times 2 (similarity: high vs. low) between-subjects design. All participants were asked to choose between two actual 256 MB MP3 players. They first read a purported excerpt from a consumer electronics magazine that described the importance of memory in MP3 players. The excerpt also provided information about price and manufacturing process of two actual brands of MP3 players, Mpio and Sonken. In all

conditions, both brands offered a 256 MB MP3 player for \$149.99. In addition, the article excerpt also described a superior, 512 MB model for \$249.99 that was manufactured by one of the brands (the target brand) but not by the other. The brand names of the target and competing brands were counterbalanced across conditions.

In the enhancing conditions, the target brand was described as producing the superior 512 MB model by adding a costly chip to the 256 MB model to improve the memory. In the degrading (versioning) conditions, the target brand was described as producing the 256 MB model by removing and destroying a costly chip from the 512 MB model to reduce the memory.

In the high-similarity conditions, the 512 MB and the 256 MB alternatives of the target brand were shown to have the same color external case in photographs provided in the magazine article. In the low-similarity conditions, the color of the external cases of the 512 MB and the 256 MB alternatives differed. To ensure that differences in preference and unfairness ratings were not due to differences in preference for the case color itself, a separate pretest verified that the colors of silver and metallic blue used in the study were equally preferred. In addition, the case colors were also counterbalanced between the versions within each condition.

After reading about the available MP3 players, participants indicated their intent to purchase either the target's or the competitor's 256 MB player using a 13-point scale anchored at each end with "definitely more likely to buy the Mpio 256 MB MP3 player" and "definitely more likely to buy the Sonken 256 MB MP3 player." Next, participants rated unfairness on the three 7-point scales (unfair, unacceptable, and unethical) as in the prior studies. As a manipulation check, participants also rated the perceived similarity of the target brand's 256 MB and 512 MB MP3 players using a 7-point scale anchored by "very dissimilar" to "very similar."

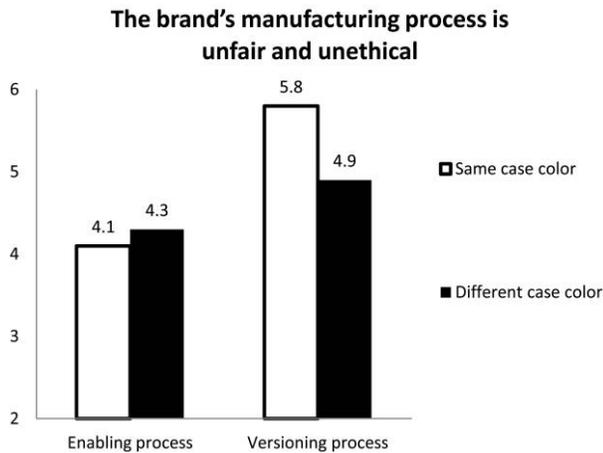
Results

Similarity. As noted above, pretesting indicated no difference in preference for one color over another, and colors were counterbalanced in the experiment. Yet, as expected, differentiating the target brand's 512 MB model from the 256 MB model by color decreased the perceived similarity between the two versions offered by the target brand ($M_{\text{same}} = 6.0$; $M_{\text{diff}} = 5.3$; $F(1, 86) = 4.9$, $p < .05$).

Perceptions of Unfairness. The three unfairness items were combined to create a single measure of perceived unfairness ($\alpha = .86$). First, ANOVA revealed a significant main effect on unfairness depending on the method of production ($F(1, 86) = 48.9$, $p < .001$), with higher perceptions of unfairness when degrading was used ($M = 5.3$) compared to enhancing ($M = 4.2$; see fig. 1). This was qualified by a method of production by similarity interaction ($F(1, 86) = 9.1$, $p < .01$). When the manufacturer used a degrading process, unfairness ratings were lower when the versioned

FIGURE 1

STUDY 3: THE EFFECT OF MEANINGLESS PHYSICAL DIFFERENTIATION ON PERCEPTIONS OF UNFAIRNESS



model was further differentiated by a different case color ($M = 4.9$) compared to when the case colors were the same ($M = 5.8$; $F(1, 42) = 8.2, p < .01$). When the enhancing process was used, there was no effect of case color ($M_{\text{same}} = 4.1$; $M_{\text{diff}} = 4.3$; $F(1, 44) = .9, NS$).

Brand Preference. Participants' ratings of intent to purchase the target versus the competing brand are presented in figure 2. ANOVA revealed a main effect for method of production ($F(1, 86) = 7.5, p < .01$), with participants less likely to purchase the target brand when it was described as being produced by degrading ($M = 5.5$) compared to when an enhancing process was used ($M = 7.3$). There also was a significant method of production by similarity interaction ($F(1, 86) = 5.2, p < .05$). Participants were more likely to purchase the degraded product from the target brand when it was further differentiated by a unique case color ($M = 6.7$) compared to when the colors were the same ($M = 4.0$; $F(1, 42) = 7.2, p < .01$). When enhancing was used, there was no effect of case color ($M_{\text{same}} = 7.6$; $M_{\text{diff}} = 7.0$; $F(1, 44) = .9, NS$).

Discussion

The results of study 3 support the hypothesis that evaluations of unfairness for versioned products depend on violation of norms and perceptions of similarity. First, a manufacturer's use of disabling compared to enhancing processes led to increased perceptions of unfairness and lower purchase intentions. Second, consistent with our hypotheses, the negative effect of versioning on fairness and purchase intent was attenuated by decreasing the similarity between the two product models, in this instance by altering the exterior color.

Of course, to perceive that objects are dissimilar may not

require observable differences. Unobserved characteristics associated with the method of production may also influence perceived similarity between the superior and inferior models. For example, Sharp restricted access to some features on one model of its video players by covering up a switch with a face plate, leaving the switch and working components "just out of reach" (McAfee 2007). An alternative (and likely more costly) method might have been for Sharp to entirely remove the components. In terms of performance and observable characteristics, removing an internal component and disabling the component are identical. Yet removing a component (compared to leaving it in place) decreases the similarity between the superior and inferior versions. Because the models are less similar when a component is removed, perceptions of unfairness are expected to be lower relative to when a component is merely disabled. Study 4 tests this prediction.

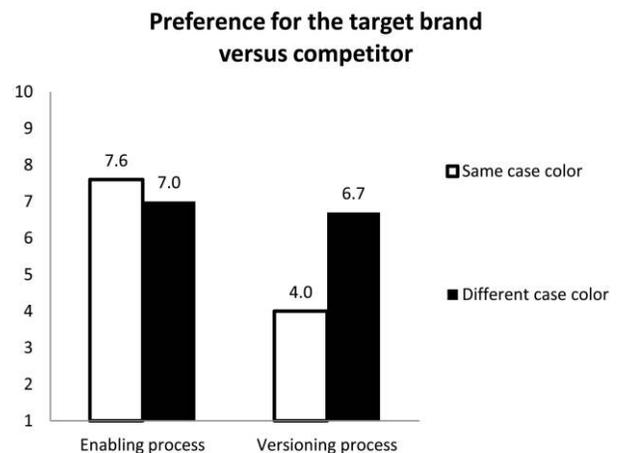
STUDY 4: VERSIONING AND MEANINGLESS UNOBSERVABLE DIFFERENTIATION

Method

Eighty-four undergraduate students from a large private university were each given \$3 for participating in study 4. All participants read a scenario involving the evaluation of a 256 MB MP3 player. The scenario included information from a consumer magazine that described how the company manufactured its MP3 players using a versioning process. In the high-similarity condition, participants read that to produce a 256 MB MP3 player the company started with a unit capable of 512 MB; prior to sealing the external case, a connection to a memory chip was cut so that it could not be repaired, but the chip remained in the unit. In the low-

FIGURE 2

STUDY 3: THE EFFECT OF MEANINGLESS PHYSICAL DIFFERENTIATION ON BRAND PREFERENCE



similarity condition, participants read that prior to sealing the external case, the connection to a memory chip was cut, and the memory chip was removed and destroyed. Thus, in the low-similarity condition, there was a greater physical (though unobservable) difference between the inferior and superior models (the former lacks a chip that the latter still has) compared to the high-similarity condition (both models still have the chip; the only difference is a severed connection). Importantly, between conditions there was no difference in performance or appearance.

A pretest ensured greater perceived similarity between the units when the chip was left in the unit compared to when it was removed. One hundred and five participants from a large university subject pool were randomly assigned to the high- or low-similarity conditions and read the same descriptions as those used in the main study. Using a marker that could be positioned from 0 to 100, they rated the similarity between the superior and inferior models. As expected, participants rated the configuration as more similar ($M = 68.6$) when the chip was left in the degraded unit than when it was removed ($M = 51.9$; $t(103) = 3.4$, $p < .001$). In each condition of the main study, participants provided ratings of unfairness as in the prior studies. Participants also provided ratings of liking for the target brand's inferior MP3 player on a 1–7 scale.

Results

Evaluations of the versioned MP3 players differed depending on the unobservable differences in the manufacturing methods. Under high similarity, when a connection was severed leaving a nonfunctioning component, the manufacturing process was perceived as more unfair and unethical ($M = 4.7$) than under low similarity, when the nonfunctioning component was removed ($M = 3.7$; $t(82) = 3.5$, $p < .001$). Preference ratings mirrored the unfairness ratings. The inferior MP3 player was less preferred in the high-similarity condition ($M = 2.9$) than in the low-similarity condition ($M = 3.6$; $t(82) = 2.0$, $p < .05$).

Discussion

Studies 3 and 4 manipulated the similarity of inferior and superior products by altering physical differences between them. In both studies, the effect of versioning on unfairness and preference was attenuated by decreasing the perceived similarity between the models. Of course, similarity need not be influenced solely through physical differences (a potentially expensive proposition for businesses). As previously noted, similarity of a current and a reference transaction may be diminished by intangible factors such as an increase in temporal distance (Dai 2010; Haws and Bearden 2006). Likewise, although not in the context of fairness, Kirmani, Sood, and Bridges (1999) showed that owners' negative reactions to a luxury brand's downward brand extension could be attenuated by decreasing similarity through subbranding.

In studies 5 and 6, we manipulate intangible differences

between product versions. In study 5, we explore spatial dissimilarity of the versioned products by manipulating the way the products are distributed. Indeed, some manufacturers who produce multiple versions of a product sell different versions side by side in the same outlets while others sell each version through different channels or retail outlets (Bergen, Dutta, and Shugan 1996). Since selling through a separate channel creates greater distance between the products, it is expected that perceptions of similarity between the products and unfairness will be reduced in these cases. In study 6, we manipulate the temporal similarity between the inferior and superior models by describing the act that degrades that product as occurring early in the manufacturing process (and temporally distant from the consumer and the final products) versus as the last step in the manufacturing process (and thus temporally close to the consumer and the final products).

STUDY 5: VERSIONING AND SPATIAL DIFFERENTIATION

The purpose of study 5 was to test whether increasing spatial distances between versioned products through use of different distribution channels would decrease perceptions of unfairness as decreasing physical similarity did in studies 3 and 4. The stimuli in study 5 were similar to those used in study 1, based on the actual instance of the IBM printer in which a chip was added to create a degraded version.

Method

Study 5 used a 2 (method of production: enhancing vs. degrading) \times 2 (spatial similarity: identical vs. separate distribution) between-subjects design. Two hundred and three volunteers from a large midwestern university were given extra credit in introductory marketing classes for participating. The stimuli were identical to those used in the enhancing and degrading conditions in study 1, in which participants chose between two printers offered by two competing brands. A purported *Consumer Reports* excerpt described the production method with the target brand producing both a faster (X-24) and a slower (X-15) printer. In the enhancing condition, the target added a computer chip to the X-15, speeding it up, to make the X-24. In the degrading condition, a chip was added to the X-24, slowing it down, to make the X-15. In addition, in study 5, the *Consumer Reports* information also described how the products were distributed. In the identical distribution conditions, participants were told that "Finally the X-15 and X-24 printers are loaded onto the same trucks and delivered at the same time to retailers Circuit City and Best Buy. At both stores, the X-24 is sold right next to the X-15 on the very same shelf." In the separate distribution conditions, this statement read "Finally, the X-24 and the X-15 are loaded onto different trucks. The X-24 is shipped for sale at Best Buy stores. The X-15 is shipped for sale at Circuit City retail stores." The retail store names are those of actual retailers that were operating at the time of data collection.

The store names were counterbalanced so that half the participants in the separate distribution conditions read that the target product was shipped for sale at Best Buy and half read that it was shipped to Circuit City. Finally, all participants read that the competing brand Y makes only one printer, which prints at 15 ppm and is available where the X-15 is sold. Dependent measures included the three fairness items (fair, acceptable, and ethical) using 7-point scales and relative preference for the target brand versus the competing brand on a 13-point scale.

A pretest was run to ensure that the degraded printer sold in the identical distribution condition was perceived as more similar than the degraded printer sold in the separate distribution conditions. One hundred and one participants from a large public university's subject pool were randomly assigned to either the same or different distribution conditions. Participants read the same descriptions as in the main study and rated the similarity between the inferior and superior models on a 7-point scale. As expected, the models were rated as more similar ($M = 4.6$) when sold at the same compared to different retailers ($M = 3.9$; $t(99) = 2.2$, $p < .05$).

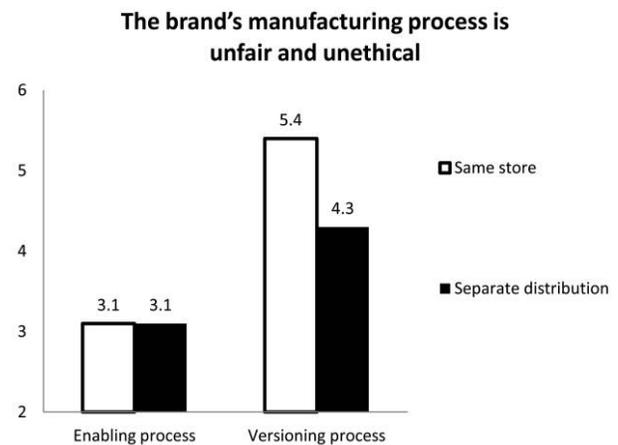
Results

Perceptions of Unfairness. The three unfairness items (unfair, unethical, and unacceptable) were combined to form a single unfairness score ($\alpha = .96$). Consistent with the prior studies, analysis of variance revealed a main effect for method of production ($F(1, 199) = 55.6$, $p < .001$), with the target brand considered less unfair and unethical in the enhancing ($M = 3.1$) compared to the degrading ($M = 4.9$) conditions (see fig. 3). The main effect for distribution method was not statistically significant ($F(1, 199) = 3.4$, $p > .05$). However, there was a method of production by distribution interaction ($F(1, 199) = 4.0$, $p < .05$). In the enhancing conditions, there was no significant difference in perceptions of unfairness for the target brand between the identical and separate distribution conditions ($M = 3.1$ in both conditions). By contrast, in the versioning conditions, separate distribution reduced perceived unfairness of the target brand ($M = 4.3$) compared to when the products were sold side by side at the same store ($M = 5.4$; $F(1, 199) = 6.7$, $p < .01$).

Brand Preference. Analysis of variance revealed a main effect for method of production ($F(1, 199) = 39.4$, $p < .001$). Participants preferred the target brand more in the enhancing ($M = 8.9$) compared to the degrading ($M = 5.6$) conditions. The main effect of distribution method was not significant ($F(1, 199) = 2.8$, NS). Again, however, there was a significant interaction between method of production and distribution method ($F(1, 199) = 8.2$, $p < .005$). In the enhancing condition, there was no significant preference difference between the identical ($M = 9.3$) and separate distribution conditions ($M = 8.6$; $F(1, 199) = .8$, NS). By contrast, as predicted, in the degrading conditions, separate distribution increased preference for the target brand ($M =$

FIGURE 3

STUDY 5: VERSIONING AND SPATIAL DIFFERENTIATION



6.8) compared to when identical distribution was used ($M = 4.4$; $F(1, 199) = 9.4$, $p < .005$).

Discussion

Overall, the results of study 5 are consistent with those of the prior studies by showing that otherwise identical products—produced through versioning—are evaluated as more unfair and are less likely to be purchased. More importantly, these results support the importance of similarity in these evaluations. While studies 3 and 4 manipulated physical similarity, study 5 manipulated similarity of distribution. Again, decreasing the similarity between superior and inferior versions attenuated the negative effects on fairness and preference. Next, in study 6, we manipulate temporal similarity by varying the timing of the versioning during the production process.

STUDY 6: VERSIONING AND TEMPORAL DIFFERENTIATION

The purpose of study 6 was to examine evaluations of unfairness when the timing of degrading differs in the production process. As noted above, prior research on pricing mechanisms has found that perceptions of unfairness may be decreased when a salient reference transaction is less recent (Dai 2010; Haws and Bearden 2006). We predict that participants will perceive that an inferior version is more similar to a superior one when degrading occurs at the very last moment in manufacturing (the inferior product is temporally close to the superior one) compared to when degrading occurs at an early step in the process (the inferior product is temporally distant from the superior one). The greater difference in time between the completed product and the act of degrading will decrease perceptions of unfairness.

Method

Study 6 manipulated the timing of degrading in the creation of an inferior model of a DVD player. All participants read about the manufacture of the DVD player that was described as having multiple steps. To create the degraded model, a computer chip responsible for higher-resolution (progressive scan) images was removed, destroyed, and replaced with a chip that would provide lower-resolution (interlaced scan) images. In the temporally close condition, the chip was described as being exchanged at the very last step in the manufacturing process, after all other components have been assembled. In contrast, in the temporally distant condition, the chip was said to be exchanged as one of the first steps in the process, before other components are assembled. The descriptions of the DVD players were otherwise held constant.

To verify that the temporally distant process indeed leads to decreased evaluations of similarity between the superior and inferior versions, a pretest was conducted. Fifty-six participants from a public university subject pool were randomly assigned to either the temporally close or the temporally distant condition. Participants read the same descriptions as in the main study and rated the similarity between the degraded and nondegraded configurations using 7-point scales. As expected, participants rated the configuration as more similar ($M = 5.0$) when the degrading occurred at the end of the manufacturing process than when it occurred at the beginning ($M = 4.1$; $t(54) = 2.0$, $p < .055$).

Seventy-seven individuals participated in the main study and evaluated the inferior version in terms of unfairness, using the same measures as in the prior studies as well as intent to purchase, using a -3 to $+3$ scale anchored with "definitely would not purchase" and "definitely would purchase."

Results

When the versioning method used to create the inferior DVD player was described as occurring at the last step in the manufacturing process, participants judged it as more unfair and unethical ($M = 5.2$) than when the versioning occurred earlier in the manufacturing process ($M = 4.5$; $t(76) = 2.2$, $p < .05$). Similarly, participants indicated they would be less willing to buy the DVD player when it was disabled at the last step ($M = -.4$) compared to earlier in the manufacturing process ($M = 1.2$; $t(77) = 2.3$, $p < .05$).

Discussion

In studies 5 and 6, participants evaluated identical sets of alternatives that differed only in how they were distributed or in the timing of degrading in their production. In study 5, perceptions of unfairness decreased and preference for the versioned alternative increased when spatial distance between the degraded inferior product and its superior base increased. Likewise, in study 6, perceived unfairness decreased and preference increased when temporal distance

between the versioned inferior product and its superior base increased.

GENERAL DISCUSSION

Key Findings and Theoretical Implications

Economists and management strategists have described versioning as Pareto optimal (Deneckere and McAfee 1996; Varian 2000). It is beneficial to firms, allowing them to price discriminate, extract consumer surplus, and reduce engineering and production costs. It is beneficial to consumers, increasing access to products and lowering prices. We show that despite these potential benefits, consumers may perceive versioning as unfair and may avoid purchase, particularly when the versioned (inferior) products are similar to their superior counterparts.

Six studies supported our hypotheses. Products with identical characteristics and features were perceived as more unfair and unethical, and preferred less, when their manufacture involved degrading a superior configuration compared to when it involved enhancing an inferior configuration or when no information about the production method was provided. However, the extent of unfairness and the decrease in preference depended on a number of factors.

First, in studies 1 and 2 we showed that, as in fairness evaluations of pricing strategies, violations of norms play an important role in fairness evaluations for production methods. Study 1 showed that given no information about the production methods, consumers infer that production costs are greater for superior compared to inferior product models. When a degrading method is used, this norm is violated. Even though the products offered the same benefits regardless of production method, participants rated the degrading method as more unfair and unethical, and they were more likely to purchase a competitor's product. Study 2 further supported this by manipulating information about norms. Again the degrading method was deemed more unfair, and purchase intent was reduced. However, learning from a third party that this is a common production method reduced the negative effects.

Next, in studies 3–6, we showed that reducing the similarity between the inferior and superior alternatives attenuated the negative effects of versioning. This was true when similarity was diminished through an observable physical difference (the case color in study 3) and an unobservable physical difference (internal components in study 4). Additionally, reducing similarity through spatial differences (distribution method in study 5) and temporal differences in the manufacturing process (study 6) attenuated the perceived unfairness and preference shifts.

The present results contribute to the growing literature on consumers' perceptions of fairness. Earlier work asserted that fairness evaluations depend on the principle of dual entitlement, where increases in price are less likely to be considered unfair if they are enacted to maintain a firm's profits due to increases in its costs (Kahneman et al. 1986). More recent work finds that perceptions of price fairness

are more complex, with fairness evaluations also depending on such factors as the intentions and reputation of the firm as well as the specific source and types of costs incurred (Bolton and Alba 2006; Bolton et al. 2003; Campbell 1999; Xia et al. 2004).

This work adds to the literature on fairness in a number of important ways. Prior research on fairness in the marketing literature has focused primarily on pricing (Bolton et al. 2003; Xia et al. 2004). The present studies are the first to examine fairness as it relates to procedures in manufacturing. This is consistent with work on perceptions of justice that contends that people consider not only allocations and outcomes in judging fairness of resource distributions but also the procedures in resource allocation (Thibaut and Walker 1975). More importantly, the present studies build on prior work that highlights the importance of norms and similarity in evaluating fairness. As noted above, pricing practices that may be considered unfair in some markets or at some period of time may come to be acceptable as they become more common (Dickson and Kalapurakal 1994; Kahneman et al. 1986). We show that fairness of production methods is also influenced by norms and may come to be acceptable if they are perceived as common practice.

Prior work on similarity in evaluations of fairness has largely been done through examinations of perceptions by consumers of their own similarity to other consumers receiving an offer. Xia et al. (2004) proposed expanding this notion to encompass all aspects of similarity between a current offer and a reference transaction. We provide support for this by offering empirical evidence of the role of similarity between inferior and superior products offered by a firm.

Although this work focused on versioning, future work could further explore other evaluations of fairness related to firms' product decisions. For example, when selling products that require replaceable components, such as digital cameras that require memory cards, firms often provide a courtesy starter component that may not be intended for regular use, such as a memory card with very low capacity. While this may be intended as a benefit to consumers, it may be perceived as unfair if consumers simulate a reference transaction of the product in regular use. In such a case, the firm may appear to have provided less than a reasonable minimum starting setup. By contrast, providing no starter card at all may not cue the same reference transaction and as a result may not lead to negative evaluations. Future research could also explore other aspects of firms' procedural decisions in judgments of fairness. For example, firms sometimes intentionally limit or reduce distribution of products by constraining the timing, the quantity, or the channels of product availability (Brown 2001). Potentially, specific aspects of distribution decisions, like production decisions, may also lower perceptions of fairness in a similarly asymmetric manner.

Alternative Explanations. One potential alternative explanation for the negative reaction to versioning is that it is wasteful, and consumers react negatively to waste (Arkes

1996). Indeed utility is squandered through versioning, and perhaps negative evaluations of waste are similar to those associated with unfairness, as resources appear to be distributed in an inefficient manner. Similarly, it may be argued that versioning is unfair because of effort exerted by the firm to keep consumers from enjoying the product's potential utility. Prior work has found that consumers increase evaluations and willingness to pay when a firm puts forth effort (to make a product better) because of a desire to reciprocate and reward those who provide benefits (Gouldner 1960; Kruger et al. 2003; Morales 2005). When the effort causes harm or removes benefits, then reciprocity would suggest that consumers may punish rather than reward.

However, if concerns about waste or effort alone were driving evaluations of fairness, then one would expect greater negative evaluations in those conditions in which increased resources were expended to differentiate the products. However, this is not what we observed. In study 3, more resources were used to decrease the similarity between the versioned alternatives (by altering the case color). In study 4, more effort was expended to remove and destroy a component as opposed to simply cutting the connection to the component. In study 5, additional resources and effort were expended to ship the products to different retail locations. Across these studies, expending more effort and resources decreased, not increased, perceptions of unfairness.

Directions for Future Research. Our studies demonstrate that the production method used by the firm has important implications for the brand's image as fair and ethical. It would be interesting to further examine consumers' response to different production methods and the attributions and inferences consumers make about the company and the brand, based on how the product was produced. Research on consumers' perceptions of price unfairness demonstrates that the inferred motive of the firm for the price increase affects fairness evaluations. In addition, the firm's prior reputation can influence the inferred motive (Campbell 1999). Thus, future research can explore whether the firm's prior reputation and its perceived motives (Campbell and Kirmani 2000) moderate the negative response to versioning.

In studies 3 and 5, we demonstrate that simple methods of cosmetic and spatial differentiation can significantly affect consumers' perceptions of unfairness and purchase intentions. Future research can further examine what other inferences consumers make when two versions of the product have a different rather than the same color or when they are sold at two different retailers rather than at the same store and explore other methods for creating differentiation between versions. Additionally, these differentiation methods may also be effective in reducing negative response to other methods of price discrimination or to other types of line and brand extensions. Moreover, it would be interesting to examine when these differentiation strategies backfire and test under what conditions consumers perceive this differentiation as the firm's attempt to deceive its consumers (see Friestad and Wright 1994; Wright 1986). Consumers may

view this differentiation strategy as a firm's decision to incur additional costs that do not improve the product but simply manipulate their perceptions.

Practical Implications

The current results have a number of important implications for marketers. First, despite cost advantages, marketers should be aware that versioning may shift preferences toward competing brands. However, our research suggests that marketers may alleviate the detrimental effects of versioning. In industries where versioning is common, firms should consider making this known in order to alter perceptions of norms. Where versioning is less common, firms may work to decrease perceived similarity between models through such tactics as making cosmetic changes (e.g., changing the color of product cases), selling versions in separate channels, or publicizing manufacturing information that increases perceived temporal distance between the final product and the time at which the versioning occurs.

Finally, our work brings to light a curiosity about versioning and evaluations of fairness. Multiple models of products that are offered at different prices allow a firm to price discriminate among consumers. Doing so often means that a firm can profitably sell more units overall: some units at higher prices to those willing to pay more and some units at lower prices to those consumers who will not bear the higher price. As a result, versioning may lead to products being accessible to consumers who might otherwise not be able to afford them (Varian 2000). Perhaps it is ironic then that a process that benefits both businesses and consumers (Deneckere and McAfee 1996) is seen as unfair and can reduce product preferences. Future research might incorporate and vary consumers' knowledge and theories about firms' abilities to offer low-priced alternatives (Wright 2002). Perhaps if consumers see that sometimes firms cannot afford to offer lower-priced models without versioning, perceptions of unfairness might also be reversed.

REFERENCES

- Adams, John Stacey (1965), "Inequality in Social Exchange," in *Advances in Experimental Psychology*, ed. L. Berkowitz, New York: Academic Press, 267–99.
- Anderson, Eric, and Duncan 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.
- Arkes, Hal R. (1996), "The Psychology of Waste," *Journal of Behavioral Decision Making*, 9 (3), 213–24.
- Bergen, Mark, Shantanu Dutta, and Steven M. Shugan (1996), "Branded Variants: A Retail Perspective," *Journal of Marketing Research*, 33 (February), 9–19.
- Block, Gerry (2006), "Sony's Grave Error: The \$499 HDMI-Lacking PS3. No HDMI, No HDCP. That Equals No 1080p Thanks to ICS. This Equation Spells Disaster," IGN.com, <http://gear.ign.com/articles/709/709495p1.html>.
- Bolton, Lisa E., and Joseph W. Alba (2006), "Price Fairness: Good and Service Differences and the Role of Vendor Costs," *Journal of Consumer Research*, 33 (September), 258–65.
- Bolton, Lisa E., Luk Warlop, and Joseph W. Alba (2003), "Explorations in Price (Un)Fairness," *Journal of Consumer Research*, 29 (March), 474–91.
- Bright, Peter (2010), "Intel's Upgradable Processor: Good Sense or Utter Catastrophe?" <http://arstechnica.com/hardware/news/2010/09/intels-upgradable-processor-good-sense-or-utter-catastrophe.ars>.
- Brown, Steven (2001), "Torment Your Customers (They'll Love It)," *Harvard Business Review*, 79 (9), 82.
- Buchan, Nancy R., Rachel T. A. Croson, and Eric J. Johnson (2004), "When Do Fair Beliefs Influence Bargaining Behavior? Experimental Bargaining in Japan and the United States," *Journal of Consumer Research*, 31 (1), 181–90.
- Campbell, Margaret C. (1999), "Perceptions of Price Unfairness: Antecedents and Consequences," *Journal of Marketing Research*, 36 (2), 187–99.
- Campbell, Margaret, and A. Kirmani (2000), "Consumers' Use of Persuasion Knowledge: The Effects of Accessibility and Cognitive Capacity on Perceptions of an Influence Agent," *Journal of Consumer Research*, 27 (1), 69–83.
- Cohen, Dorothy (1974), "The Concept of Unfairness as It Relates to Advertising Legislation," *Journal of Marketing*, 38 (3), 8–13.
- (1982), "Unfairness in Advertising Revisited," *Journal of Marketing*, 46 (1), 73–81.
- Cox, Jennifer Lyn (2001), "Can Differential Prices Be Fair?" *Journal of Product and Brand Management*, 10 (5), 264–75.
- Cryer, E. H., and W. T. Ross (1997), "The Influence of Firm Behaviour on Purchase Intention: Do Consumers Really Care about Business Ethics?" *Journal of Consumer Marketing*, 14 (6), 421–33.
- Dai, Bo (2010), "The Impact of Perceived Price Fairness of Dynamic Pricing on Customer Satisfaction and Behavioral Intentions: The Moderating Role of Customer Loyalty," unpublished dissertation, Auburn University, Auburn, AL.
- Darke, Peter R., and Darren Dahl (2003), "Fairness and Discounts: The Subjective Value of a Bargain," *Journal of Consumer Psychology*, 13 (3), 328–38.
- Deneckere, Raymond J., and R. Preston McAfee (1996), "Damaged Goods," *Journal of Economics and Management Strategy*, 5 (2), 149–74.
- Diaz, Jesus (2007), "Apple iPod Touch Calendar Can't 'Add' Appointments: Why, and What Else Is Being Crippled?" <http://gizmodo.com/gadgets/breaking/apple-ipod-touch-calendar-cant-add-appointments-why-and-what-else-is-being-crippled-297994.php>.
- Dickson, Peter R., and Rosemary Kalapurakal (1994), "The Use of Perceived Fairness of Price-Setting Rules in the Bulk Electricity Market," *Journal of Economic Psychology*, 15 (3), 427–48.
- Festinger, Leon (1954), "A Theory of Social Comparison Processes," *Human Relations*, 7 (2), 117–40.
- Folger, Robert (1977), "Distributive and Procedural Justice: Combined Impact of Voice and Improvement on Experienced Inequity," *Journal of Personality and Social Psychology*, 35 (February), 108–19.
- Folger, Robert, and Edward Eliyahu Kass (2000), "Social Comparison and Fairness: A Counterfactual Simulations Perspective," in *Handbook of Social Comparison: Theory and Research*, ed. Jerry Suls and Ladd Wheeler, New York: Plenum, 423–41.

- Friestad, Marian, and Peter Wright (1994), "The Persuasion Knowledge Model: How People Cope with Persuasion Attempts," *Journal of Consumer Research*, 21 (June), 1–31.
- Gouldner, Alvin W. (1960), "The Norm of Reciprocity: A Preliminary Statement," *American Sociological Review*, 25 (2), 161–78.
- Grewal, Dhruv, David M. Hardesty, and Gopalkrishnan R. Iyer (2004), "The Effects of Buyer Identification and Purchase Timing on Consumers' Perceptions of Trust, Price Fairness, and Repurchase Intentions," *Journal of Interactive Marketing*, 18 (4), 87–100.
- Grewal, Dhruv, Kent B. Monroe, and R. Krishnan (1998), "The Effects of Price-Comparison Advertising on Buyers' Perceptions of Acquisition Value, Transaction Value, and Behavioral Intentions," *Journal of Marketing*, 62 (April), 46–59.
- Hahn, Jong-Hee (2006), "Damaged Durable Goods," *Rand Journal of Economics*, 37 (1), 121–33.
- Haws, Kelly L., and William O. Bearden (2006), "Dynamic Pricing and Consumer Fairness Perceptions," *Journal of Consumer Research*, 33 (December), 304–11.
- Hobart, Randy (2003), "2003 Keyless Entry System Upgrade," <http://www.customtacos.com/tech/index.php?article=12>.
- Horowitz, Adam (2005), "101 Dumbest Moments in Business," *Business 2.0*, http://money.cnn.com/magazines/business2/business2_archive/2005/01/01/8250237/index.htm.
- Hruska, Joel (2010), "Intel Test Marketing Artificially Constrained 'Upgradeable' Processors," <http://hothardware.com/News/Intel-Test-Marketing-Artificially-Constrained-Upgradeable-Processors/>.
- Huang, Jen-Hung, Ching-Te Chang, and Cathy Yi-Hsuan Chen (2005), "Perceived Fairness of Pricing on the Internet," *Journal of Economic Psychology*, 26 (3), 343–61.
- Hui, Michael K., Xiande Zhao, Xiucheng Fan, and Kevin Au (2004), "When Does the Service Process Matter? A Test of Two Competing Theories," *Journal of Consumer Research*, 31 (September), 465–75.
- Ingram, Rhea, Steven J. Skinner, and Valarie A. Taylor (2005), "Consumers' Evaluation of Unethical Marketing Behaviors: The Role of Customer Commitment," *Journal of Business Ethics*, 62 (3), 237–52.
- Kahneman, Daniel, Jack L. Knetsch, and Richard Thaler (1986), "Fairness as a Constraint on Profit Seeking: Entitlements in the Market," *American Economic Review*, 76 (4), 728–41.
- Kambil, Ajit, and Vipul Agrawal (2001), "The New Realities of Dynamic Pricing," *Accenture Outlook*, 2 (2), 15–21.
- Kimes, Sheryl E. (1994), "Perceived Fairness of Yield Management," *Cornell Hotel and Restaurant Administration Quarterly*, 35 (1), 22–29.
- (2002), "Perceived Fairness of Yield Management," *Cornell Hotel and Restaurant Administration Quarterly*, 43 (1), 21–30.
- Kingsley-Hughes, Adrian (2007), "iPod Touch—Nice Device, Shame Apple Crippled It," <http://www.zdnet.com/blog/hardware/ipod-touch-nice-device-shame-apple-crippled-it/904>.
- Kirmani, Amna, Sanjay Sood, and Sheri Bridges (1999), "The Ownership Effect in Consumer Responses to Brand Line Stretches," *Journal of Marketing*, 63 (1), 88–101.
- Kruger, Justin, Derrick Wirtz, Leaf van Boven, and T. William Altermatt (2003), "The Effort Heuristic," *Journal of Experimental Social Psychology*, 40 (1), 91–98.
- Maxwell, Sarah (1999), "The Social Norms of Discrete Consumer Exchange: Classification and Quantification," *American Journal of Economics and Sociology*, 58 (4), 999–1018.
- (2002), "Rule-Based Price Fairness and Its Effect on Willingness to Purchase," *Journal of Economic Psychology*, 23 (2), 191–212.
- McAfee, R. Preston (2007), "Pricing Damaged Goods," *Economics—the Open Access, Open Assessment E-Journal*, 1, <http://www.economics-ejournal.org/economics/discussionpapers/2007-1>.
- Melanson, Donald (2007), "Canon Firmware Hack Unlocks Features on DIGIC II-Based Cameras," <http://www.engadget.com/2007/09/11/Canon-Firmware-Hack-Unlocks-Features-on-DIGIC-II-Based-Cameras/>.
- Mick, Jason (2010), "Get Radeon HD 6970 for Price of HD 6950 via Firmware Unlock," <http://www.dailytech.com/Get+Radeon+HD+6970+for+Price+of+HD+6950+Via+Firmware+Unlock/article20485.htm>.
- Morales, Andrea C. (2005), "Giving Firms an 'E' for Effort: Consumer Responses to High-Effort Firms," *Journal of Consumer Research*, 31 (4), 806–12.
- Morrison, Mac (2005), "Still King Latest M5 Conquers All, Regardless of BMW's Gizmo Overload," *Autoweek* (December 5).
- Novoseltsev, Alexey, and Luk Warlop (2002), "Toward Understanding of the Dual Entitlement Principle in Consumer Fair Price Judgments," in *Asia Pacific Advances in Consumer Research*, Vol. 5, ed. Rami Zwick and Tu Ping, Valdosta, GA: Association for Consumer Research, 180–85.
- Oliver, Richard L., and John E. Swan (1989), "Consumer Perceptions of Interpersonal Equity and Satisfaction in Transactions: A Field Survey Approach," *Journal of Marketing*, 53 (2), 21–35.
- Perton, Mark (2006), "\$500 PS3 to Lack HDMI, WiFi, Card Reader," <http://www.engadget.com/2006/05/08/500-ps3-to-lack-hdmi-wifi-cardreader/>.
- Shapiro, Carl, and Hal R. Varian (1998), "Versioning: The Smart Way to Sell Information," *Harvard Business Review*, 76 (6), 106–14.
- Sorrel, Charlie (2007), "Add Features to Low End Canon Cameras: Free," <http://blog.wired.com/gadgets/2007/09/add-features-to.html>.
- Stross, Randall (2007), "Want an iPhone? Beware the iHandcuffs," *New York Times*, January 14, <http://www.nytimes.com/2007/01/14/business/yourmoney/14digi.html?pagewanted=all>.
- Thaler, Richard (1985), "Mental Accounting and Consumer Choice," *Marketing Science*, 4 (3), 199–214.
- Thibaut, John, and Laurens Walker (1975), *Procedural Justice: A Psychological Analysis*, Hillsdale, NJ: Erlbaum.
- Tversky, Amos, and Daniel Kahneman (1974), "Judgment under Uncertainty: Heuristics and Biases," *Science* 185 (September 27), 1124–31.
- Vaidyanathan, Rajiv, and Praveen Aggarwal (2003), "Who Is the Fairest of Them All? An Attributional Approach to Price Fairness Perceptions," *Journal of Business Research*, 56 (June), 453–63.
- van den Bos, Kees, E. Allan Lind, Riël Vermunt, and Henk A. M. Wilke (1997), "How Do I Judge My Outcome When I Do Not Know the Outcome of Others? The Psychology of the Fair Process Effect," *Journal of Personality and Social Psychology*, 72 (5), 1034–46.
- Varian, Hal R. (2000), "Versioning Information Goods," in *Internet Publishing and Beyond*, ed. Brian Kahin and Hal R. Varian, Cambridge, MA: MIT Press, 190–202.

- Walker, Laurens, Stephen LaTour, F. Allan Lind, and John Thibaut (1974), "Reactions of Participants and Observers to Modes of Adjudication," *Journal of Applied Social Psychology*, 4 (October–December), 295–310.
- Wright, Peter (1986), "Schemer Schema: Consumers' Intuitive Theories about Marketers' Influence Tactics," *Advances in Consumer Research*, 13, 1–3.
- (2002), "Marketplace Metacognition and Social Intelligence," *Journal of Consumer Research*, 28 (4), 677–82.
- Wu, Tim (2007) "Wireless Net Neutrality: Cellular Carterfone and Consumer Choice in Mobile Broadband," http://www.newamerica.net/publications/policy/wireless_net_neutrality.
- Xia, Lan, Kent B. Monroe, and Jennifer L. Cox (2004), "The Price Is Unfair! A Conceptual Framework of Price Fairness Perceptions," *Journal of Marketing*, 68 (4), 1–15.