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PRICE FORMAT AND THE EVALUATION OF MULTICOMPONENT GOODS

Abstract
A new link between price format and consumer preferences is introduced in the context of transactions related to multicomponent goods. Multicomponent goods combine a focal object or service (an item of clothing, theater tickets, etc.) with one or more infrastructural elements that fulfill some essential, subordinate role (shipping and handling, booking service, etc.). In this context firms need to decide whether to post a single price (aggregate pricing) or break down the expense into a set of charges that reflects the underlying product structure (disaggregate pricing). Evidence from five studies consistently supports the general hypothesis that price format modifies the shape of consumer response. An information processing explanation is proposed whereby the salience of infrastructural components in evaluation is contingent on price format. This theory reconciles existing contradictory results in the literature and suggests that pricing impacts perceived value as much as it captures it.

KEY WORDS: Consumer behavior, framing effects, attention, information processing, pricing research.
Imagine buying an office chair from an online furniture store. Upon checking out you see that the price of the chair is $85.95 including overnight shipping and handling. How would you rate this deal? Alternatively, imagine that you find the price of the chair to be $81 and overnight delivery to be charged separately at $4.95. Would your evaluation change? Would you pay more attention to the delivery service in the second scenario?

Whereas standard utility theory views normatively equivalent methods of presentation as irrelevant, the extensive literature on the effects of framing on preference elicitation (e.g., Payne 1982; Slovic 1995; Tversky and Kahneman 1981, 1986) demonstrates that alternative ways of representing the same offer can strongly affect judgment and choice. In a preliminary study that employed the foregoing scenario, participants ($n = 52$) indicated that they viewed the $81 + $4.95 format significantly more likely to induce purchase than the $85.95 format ($M = 6.79$ on a 1-9 scale where $M = 5$ marked the indifference point; $t(51) = 6.42, p < .001$).

In practice, disaggregate pricing has become increasingly common.¹ We see component charges (product price plus shipping and handling fees, convenience charges, etc.) posted not only in predictable settings such as Internet sites and catalogs, but also in unexpected circumstances such as when furniture stores break out the cost of pillows for a sofa, hotels assess fees for extra room keys, and Christmas tree sellers separate the price of netting from that of the trees.

A few papers in the marketing literature have argued that partitioning an expense enhances the evaluation of a product and, consequently, increases demand for it (Chakravarti, Krish, Paul, and Srivastava 2002; Morwitz, Greenleaf, and Johnson 1998). But backlash in response to the proliferation

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of surcharges imposed by service firms and some inconsistencies in the existing literature suggest that consumers actually respond more favorably to aggregated prices.

With these ambiguities in mind, this paper systematically investigates the influence of price format on perceptions of value and proposes a parsimonious psychological mechanism that jointly explains contingent effects. The general hypothesis is that alternative price formats change the relative weight (or salience) of infrastructural components in goods evaluation and that this contingent weighing affects preferences in a predictable manner. This hypothesis builds on the premise that consumers trade off the perceived accuracy and effort of applying different evaluation strategies (Huber 1980; Johnson and Payne 1985; Shugan 1980). Because consumers invest sufficient cognitive effort in assessing their preferences for infrastructural components only when these are allocated a proportion of the total expense, an aggregated price induces an evaluation based exclusively on the merits of the focal component. Conversely, a disaggregated price facilitates evaluation of both components resulting in a multivariate judgment that, ironically, often assigns excessive importance to infrastructural components.

Throughout, the analysis focuses on consumer evaluations of multicomponent goods (hereafter referred to simply as products). A multicomponent good is understood to be a product or service that involves two types of components, (1) a focal component, being the object of direct interest to the consumer (e.g., an item of clothing, theater tickets, groceries), and (2) an infrastructural component, a secondary or subordinate but nevertheless necessary element (e.g., shipping and handling, booking service, delivery scheduling).2 Firms that market multicomponent goods need to decide whether to post a single, consolidated price (aggregate pricing) or a set of smaller charges that reflect this underlying product structure (disaggregate pricing).

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2 Multicomponent goods differ from conventional bundles on one important dimension. Whereas bundles are typically composed of two or more distinct goods of independent value, the value of the infrastructural feature in a multicomponent good is contingent on demand for the focal object or service it complements.
In the next section we review the relevant literature on price format and discuss some of its key limitations. We then introduce a simple descriptive model of consumer response that addresses these concerns and captures the proposed link between price format and preference formation. Five studies that test the validity of the theory are then presented. We conclude with a discussion of the theoretical and managerial implications of our findings.

Background

The existing marketing literature includes theories consistent with an impact of price format on demand. Relying on mental accounting (Thaler 1985; Thaler and Johnson 1990), one could argue that posting a disaggregated price will increase the perceived impact of the loss of money associated with the transaction; that is, partitioning an expense increases price sensitivity.

A possibly stronger argument, however, might be made that disaggregated prices reduce price sensitivity. As pointed out by Ayres and Nalebuff (2003), disaggregate pricing could enable firms to increase revenue while seeming to price competitively in markets that correspond to separate components. Morwitz et al. (1998) have demonstrated that participants who were charged a tax on their bid price consistently paid more for the same product than those in a control group that was not so taxed. To explain this result, the authors suggested that consumers process disaggregated prices by anchoring on the larger expense and adjusting (insufficiently) for the remainder. Chakravarti et al. (2002) have proposed, with reference to mental accounting, that positive effects of disaggregated prices are attributable to an induced perception that benefits are multiple (segregated).

In the aggregate, existing evidence suggests that preferences are affected by price format. The direction of this effect, however, is ambiguous. Mental accounting has been evoked both to support and to discredit disaggregate pricing depending on whether the focus was on gains (benefits) or losses.
(expenses), respectively. Similarly, the argument that partitioned pricing increases demand due to an anchoring and adjustment heuristic was supported in auction but not in choice tasks. These empirical and theoretical ambiguities point to the need for a parsimonious theory that can make convincing contingent predictions.

The present work connects not only with the emerging literature on price format, but also with recent efforts in economics to formulate conditions under which profit-maximizing firms should market products that include “shrouded” attributes (Ellison 2005; Gabaix and Laibson 2005). An infrastructural component is a particular type of shrouded attribute, one that is both mandatory and common knowledge at the time of purchase. In these models the derived equilibrium is for firms to attract consumers by pricing the focal, desired component competitively and hiding from the naïve segment of the population ancillary charges on discretionary (but often unavoidable) components.

Themes such as the temporal reframing of transactions (Gourville 1998; Prelec and Loewensteing 1998) and of bundling as a vehicle for price discrimination under heterogeneous demand (e.g., Schmalensee 1982) or means to exploit the behavioral consequences of perceived savings (e.g., Yadav and Monroe 1993) are not directly addressed, the emphasis here being on single products with multiple components. Similarly, this paper is conceptually related to other discussions of framing effects (e.g., Hauser 1986; Levin, Schneider, and Gaeth 1998; Park, Jun, and Macinnis 2000), but distinguished by the focus on price as the key attribute of interest.

**Consumer Response to Price Format**

According to standard utility theory preferences should be invariant with respect to the mode of presentation of market offers. The present research argues, to the contrary, that alternative descriptions
of the same terms of exchange will, by affecting the relative salience of a product’s multiple contributions, produce systematically different judgments. Our theory can be captured in the following formalization of the evaluation of good $X$ composed of focal component $x_f$ and infrastructural component $x_i$ offered at total price $P$:

$$V(X, P, p_i) = v_f(x_f, P - p_i) + \delta_{[p_i > 0]} \cdot (1 + \beta) \cdot v_i(x_i, p_i)$$

where $\delta_{[p_i > 0]}$ is equal to 1 when a distinct positive price $p_i$ is posted for the infrastructural component (and equal to 0 otherwise), and $\beta \geq 0$ represents a bias that exaggerates the importance of the infrastructural component when it is accounted for. Such a bias is hypothesized because (when activated) the tangible and habitual nature of infrastructural elements is expected to confer on their evaluation a perception of relative certainty or diagnosticity that consumers might favor (Brynjolfsson and Smith 2000). The remainder of this section offers additional justification for this model and explains how our experimental studies test its underlying hypotheses.

Posting an all-inclusive price creates a mismatch between the number of components and prices to evaluate making the evaluation of individual components effortful and increasing the likelihood that buyers will fail to fully explore their preferences (Smith 1976). If one assumes that individuals trade off the perceived accuracy and effort of applying different evaluation strategies (Huber 1980; Johnson and Payne 1985; Shugan 1980), the most plausible scenario is that consumers will simplify the evaluation process and draw inferences based only on a single, perceptually dominant piece of information or heuristic cue: the focal component (Kardes, Posavac, and Cronley 2004; Yadav 1994). The use of this heuristic is instrumental in the sense that it is directed by the consumer’s prominent goal. By focusing on the most salient component the consumer minimizes cognitive effort (Fiske and Taylor 1984) and maximizes the likelihood of correctly evaluating the offer (as infrastructural...
components represent a smaller portion of the total expense).

It is easier for consumers to impute a subjective judgment for each component when the price of a good is disaggregated. But the literature on information processing suggests that integration of these values into an overall evaluation is subject to bias (Gaeth et al. 1990; Kahn and Meyer 1991). We propose that product evaluations are based on the appraisal of both focal and infrastructural components and that the weights assigned to each depend on their relative diagnosticity for the task at hand. We also suggest that consumers generally have a perception of greater diagnosticity for infrastructural components because these are more frequently encountered (e.g., virtually all catalog transactions involve delivery) and homogeneous (e.g., books might be many, but delivery methods are few) than the focal element. Infrastructural components thus tend to be overweighed during preference formation when the price format re-sensitizes consumers to their presence (Wathieu 2004). This logic can be contrasted with the anchoring and adjustment process suggested by Morwitz et al., price disaggregation in the present model being assumed to highlight the secondary component rather than cause it to be discounted.

Study 1, which illustrates the basic effect of price format on the likelihood that consumers evaluated the infrastructural component, shows the existence of the indicator function \( \delta_{\{p_i > 0\}} \). Because the relative weight of the infrastructural component varies depending on price format, the direction of the price format effect ultimately hinges on the attractiveness of this component. This result is replicated across multiple categories and persists even when the logical equivalence of price formats is made evident.

Study 2 examines disaggregate pricing exclusively to test for the existence of a bias \((\beta > 0)\). By varying the allocation of a total expense across components we demonstrate the propensity of individuals to overweigh the importance of infrastructural components that are assigned a specific
price. Study 3 rules out alternative explanations of the effect obtained in Study 2 and demonstrates that manipulation of the diagnosticity attached to either type of component affects the way component evaluations are integrated to form an overall judgment.

Study 4 is a predictive test of the underlying mechanism that measures consumer evaluations directly at the component level and compares various models of integration. Study 5, which justifies the relevance of the focal versus infrastructural distinction, shows that price format becomes irrelevant when an infrastructural component is replaced by an additional focal element.

**Study 1: Aggregate vs. Disaggregate Pricing**

This study investigates the basic effect of alternative price formats on preference formation. One objective is to show that the salience of an infrastructural component in the evaluation process is greater under disaggregate pricing. In addition, we want to demonstrate that this feature naturally leads to a parsimonious approach to determining whether aggregate or disaggregate pricing leads to greater perceived value.

**Method**

The experiment employed a 2 (price format: aggregate, disaggregate) × 2 (perceived value of infrastructural component: good deal, bad deal) between-subjects design. Each participant was exposed to two purchase scenarios, one involving air travel, the other flowers (Appendix A reproduces the stimulus used for the air travel replicate). The infrastructural components were in-flight entertainment plus meal service and a message card, respectively.
For each scenario participants were presented with two alternatives described by quality attributes and price. The within-subjects allocation of stimuli was randomized, with the added constraint that participants should not be exposed to the same condition twice. Option A, the *comparison* alternative, was held constant across conditions and featured low quality and price. Option B, the *test* alternative, varied with the experimental design and included a high-quality/high-price focal component. The perceived value of the infrastructural component was manipulated by varying, for the same price, the quality of the benefit provided. Participants were asked to read the scenario and indicate their relative preference using an 8-point scale (1 = “definitely option A,” 8 = “definitely option B”), then rate the overall attractiveness of each offer on a 7-point scale (1 = “very unattractive,” 7 = “very attractive”). As a manipulation check, the perceived value of the infrastructural component was measured by an attractiveness rating on a scale from -3 (“very unattractive”) to 3 (“very attractive”).

The participants were 210 registered members of a subject pool managed by the research center of a large business school on the east coast of the United States. The general population of 5,447 members is, on average, 39% male and 31 years of age. Eighty-seven percent of the members have completed undergraduate education or higher. Participants were selected at random and recruited via e-mail. No specific eligibility requirement was specified. The experiment was carried out online. Accessed through a designated URL, the experiment was introduced generically as an exercise in understanding consumer decision-making and interspersed among a series of other, unrelated survey questions. Participants were informed in advance of the expected duration of the poll (approximately 20 minutes) as well as the time interval during which the URL remained active (typically 24 hours). They were also told that participation involved hypothetical purchase decisions, that there were no

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3 The information (component types, quality levels, prices, etc.) used to develop the various stimuli presented in this paper reflects actual market conditions.
right or wrong answers, and that they should consider only their own preferences. Participation was voluntary, with a $5 payment upon completion.

Results

Responses were examined using analysis of variance (ANOVA) and planned orthogonal contrasts. A preliminary analysis showed no effect of the within-subjects allocation of replicates to participants. This analysis also indicated that the perceived value of the infrastructural components was manipulated as intended: participants rated “good deal” infrastructural components as more attractive than those that represented a “bad deal” ($M_{good\ deal} = 1.95$ versus $M_{bad\ deal} = -1.15$; $t(405) = 8.58, p < .001$). Finally, the use of product category as a covariate was significant. A separate ANOVA that included product category as a fully crossed factor, however, revealed a baseline main effect but no significant interaction with the remaining experimental variables. For that reason, it was decided to report only aggregate results.\(^4\)

The two preference measures (relative preference and overall attractiveness), being sufficiently correlated ($\alpha = .73$), were converted into one variable by standardizing both scales on a 10-point range and averaging (Nunnaly and Bernstein 1994). An ANOVA on this composite measure revealed that evaluations of the test alternative (option B) were sensitive to changes in the perceived value of the infrastructural component ($M_{good\ deal} = 7.28$ versus $M_{bad\ deal} = 6.33$; $F(1, 405) = 20.88, p < .001$). This effect was qualified, however, by a significant interaction with price format ($F(1, 403) = 22.41, p < .001$) as shown in Figure 1.

Recall that our framework implies (1) that a change in the perceived value of infrastructural components affects the overall evaluation of a product sold at a disaggregated price, but has no bearing when this price is all-inclusive, and (2) that a good (bad) deal on the infrastructural component of a

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\(^4\) A separate analysis of each product category confirmed this choice. Although scores on the air travel category were systematically higher, the pattern of responses across replicates was identical.
product offering is more (less) appealing if the posted price is disaggregated. To test the first hypothesis we held price format constant and isolated the manipulation of infrastructural components. As predicted, the effect on overall product evaluations was asymmetrical: a change in the perceived value of infrastructural components was significant with disaggregate ($M_{\text{disaggregate/good deal}} = 7.76$ versus $M_{\text{disaggregate/bad deal}} = 5.81$; $t(202) = 6.58, p < .001$) but not with aggregate ($M_{\text{aggregate/good deal}} = 6.81$ versus $M_{\text{aggregate/bad deal}} = 6.84$; $t(201) = -.12, p = .907$) pricing. Conversely, to test the second hypothesis we held the perceived value of infrastructural components constant and isolated the manipulation of price format. Consistent with our prediction we were able to show a reversal in the relative appeal of price formats: when the perception of infrastructural components was favorable the test alternative was more attractive if the price was disaggregated ($t(194) = 3.16, p = .002$). This result, however, was reversed when the perception of infrastructural components was unfavorable ($t(209) = -3.55, p = .001$).

FIGURE 1: Composite Preference Measure by Experimental Condition (Study 1).
Extension 1: Control Condition with Partial Description

Further evidence that aggregate pricing induced participants to neglect infrastructural components was obtained by complementing the main experimental design with a control condition in which the test alternative was described without reference to infrastructural components. If the proposed effect of price format on information processing holds, planned contrasts should reveal significant differences only with respect to the two disaggregated price conditions. Consistent with H1, participants evaluated the test alternative similarly across all aggregate pricing conditions (where $M_{control} = 6.78$) but reacted as predicted when presented with disaggregated prices (Table 1).

<table>
<thead>
<tr>
<th>Contrast type</th>
<th>Value of contrast</th>
<th>$t$-statistic ($df$)</th>
<th>$p$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$M_{disaggregate/good deal} - M_{control}$</td>
<td>.980</td>
<td>3.14 (193)</td>
<td>.002</td>
</tr>
<tr>
<td>$M_{disaggregate/bad deal} - M_{control}$</td>
<td>-.969</td>
<td>-3.21 (208)</td>
<td>.001</td>
</tr>
<tr>
<td>$M_{aggregate/good deal} - M_{control}$</td>
<td>.028</td>
<td>.09 (200)</td>
<td>.929</td>
</tr>
<tr>
<td>$M_{aggregate/bad deal} - M_{control}$</td>
<td>.062</td>
<td>.20 (201)</td>
<td>.840</td>
</tr>
</tbody>
</table>

Extension 2: Increased Salience of Price Format Manipulation

Would the results of Study 1 change if participants were explicitly told that the total price of the two alternatives is the same and that the only difference is in the way the expense is presented? To answer to this question we replicated the experimental design in Study 1, adding the following initial instructions.

In the following situation we are interested in understanding your response to alternative ways of presenting price information. The alternatives described below are equivalent in terms of total price but differ in how this price is broken up. Think about how you would react if you were facing this situation and then answer the accompanying questions.

This experiment employed a similar 2 (price format: aggregate, disaggregate) $\times$ 2 (perceived value of infrastructural component: good deal, bad deal) between-subjects design. Two new product categories were used – hotel accommodation plus fitness center access and groceries plus delivery scheduling –
and participants again answered questions for both scenarios (see Appendix B for an example) responding, in each instance, to the stimulus that the firm had recently increased its price and was now deciding how to present the new price to consumers. New Format 1 was held constant, listing a simple price without reference to the infrastructural component; New Format 2 changed according to the experimental conditions. The perceived value of the infrastructural component was manipulated by varying the fit between the needs of the average customer (as portrayed in the stimulus) and what the firm offered.

Participants were asked to read the scenario and rate on an 8-point scale the likelihood that they would buy from this firm if New Format 2 were adopted (1 = “definitely less likely,” 8 = “definitely more likely”) and to indicate which price format made the price change look more appealing (1 = “definitely format 1,” 8 = “definitely format 2”). As a manipulation check the perceived value of the infrastructural components was measured by an attractiveness rating on a 7-point scale (-3 = “very unattractive,” 3 = “very attractive”).

The participants were 218 members of the same database used for the first experiment, randomly selected from among those who had not yet participated and recruited via e-mail. A preliminary analysis showed no effect of the within-subjects allocation of replicates. The data were collapsed across dependent measures by averaging individual scores (α = .78). Inclusion of product category as a covariate was not significant so the data were also aggregated across replicates. The initial analysis confirmed that the perceived value of infrastructural components was manipulated as intended: participants rated infrastructural components related to their needs as more attractive than those that were unrelated (Mgood deal = 1.58 versus Mbad deal = - .81; t(429) = 5.06, p < .001).

Hypothesis testing was conducted using ANOVA and planned orthogonal contrasts. The ANOVA revealed a main effect of perceived value of infrastructural components (Mgood deal = 4.66
versus $M_{\text{bad deal}} = 4.12; F(1, 429) = 10.07, p = .002$). This effect was qualified, however, by a significant interaction with price format ($F(1, 427) = 10.73, p = .001$). The planned contrasts clearly support H1 and confirm the original findings. First, the participants’ evaluation of the overall product was stronger when the posted price was disaggregated and the infrastructural component was perceived to be a good deal ($M_{\text{disaggregate/good deal}} = 4.95$ versus $M_{\text{aggregate/good deal}} = 4.37; t(211) = 2.29, p = .023$). When the infrastructural component represented a bad deal, however, this result was reversed ($M_{\text{disaggregate/bad deal}} = 3.85$ versus $M_{\text{aggregate/bad deal}} = 4.39; t(216) = -2.25, p = .025$). Second, the influence of infrastructural components was felt exclusively within the disaggregated price structure ($t_{\text{disaggregate}}(216) = 4.59, p < .001; t_{\text{aggregate}}(211) = -.08, p = .936$).

Discussion

The main objective of Study 1 was to demonstrate that the evaluation of multicomponent goods is affected by the way price information is presented. To this end, two experiments provide convergent evidence that alternative price formats can either stimulate or inhibit the evaluation of an infrastructural component and, as predicted, that this asymmetry induces systematic shifts in preference. This effect was shown to be robust across different product categories and consumption settings. Informing participants of the objective equivalence of price formats before exposure to the stimuli had no substantial impact on responses.

A key finding is that infrastructural components have no distinct influence on evaluative judgments unless the price of the product is disaggregated. Consequently, contingent on the perceived value (positive or negative) of the infrastructural component, an offer can appear more or less desirable depending on which price format a firm selects. An airline, for example, would benefit by segregating the cost of in-flight entertainment as long as consumers view this component favorably. An online grocer, on the other hand, should integrate the price of delivery scheduling if this feature is perceived
to be a negatively valued weakness. This pattern of contingent results illustrates one approach to reconcile the contradictions found in the literature. By recognizing that price format affects the way consumers approach infrastructural components we have been able to generate situations in which one or the other price format is preferred.

**Study 2: Integration Bias Under Disaggregate Pricing**

The previous study demonstrates the irrelevance of infrastructural components under aggregate pricing. What remains unclear, however, is how important these infrastructural components become once a specific price is assigned to them. Normatively, we might expect consumers to weigh each individual component according to its relative monetary worth. On the other hand, evidence in the marketing literature suggests that individuals typically integrate product information with biases (Gaeth et al. 1990; Kahn and Meyer 1991). Our framework suggests that consumer preferences will systematically outweigh the importance of infrastructural components, the value of which is easier to assess than that of focal components.

The relative weight of components can be studied by holding total expense constant and measuring changes in product evaluations as the ratio of component prices is experimentally manipulated. To this end we define:

\[
\text{Component Price Ratio (CPR)} = \frac{\text{Price of Focal Component}}{\text{Price of Infrastructural Component}}
\]

If a decrease in the CPR leads to a decrease in the product’s overall evaluation (and the converse) one should conclude that the evaluation is driven by the price of the infrastructural component; that is, that price decreases at the level of the focal component fail to compensate for price increases at the level of the infrastructural component. Study 1 has shown that when the infrastructural component is not
considered attractive aggregated price formats are preferred. Similarly, for a given level of component attractiveness, if the relative price of the infrastructural component rises too high (for a fixed total price) aggregated price formats should become preferable.

**Pre-Test**

Thirty six undergraduate students participated in a pre-test conducted to elicit for ten pairs of focal and infrastructural components mean and variance estimates of willingness to pay (WTP). Participants approached on campus were asked to fill out a brief questionnaire.\(^5\) Table 2 summarizes the results. As predicted, individuals generally appear to have a more pointed estimate of their WTP for infrastructural components (as measured by the ratio of the mean range of acceptable prices over the mean WTP; \(M_{\text{infrastructural}} = .518\) versus \(M_{\text{focal}} = .417\); \(t(70) = 6.16, p < .001\)). For the main experiment, to ensure a conservative test of our hypothesis (which rests on the premise that consumers are more ambiguous in their evaluation of the focal component) we selected the two product categories (CDs and books) with the lowest variance on the focal component. The average WTP price of a top-40 CD was $15, that of a best-selling hardcover novel $24. For both categories the expected price of standard shipping and handling was $4.

**Method**

Study 2 employed a single-factor, six-level design. The six CPR levels included one aggregate and five disaggregate pricing conditions. Of the latter, one condition reproduced the WTP mean values collected in the pre-test; the remainder featured different price splits at $3 intervals. Table 3 lists all of these combinations together with the coding used for the analysis. Note that in all cases total expense was held constant across conditions.

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\(^5\) Details of this survey are available from the authors.
### TABLE 2: Mean and Variance Estimates of WTP (Study 2, Pre-Test).

<table>
<thead>
<tr>
<th>Product Category</th>
<th>Component Type</th>
<th>Description</th>
<th>Mean ($)</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compact Discs</td>
<td>Focal</td>
<td>Music CD</td>
<td>15.33</td>
<td>.351</td>
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<tr>
<td></td>
<td>Infrastructural</td>
<td>Shipping &amp; Handling</td>
<td>4.15</td>
<td>.214</td>
</tr>
<tr>
<td>Eyewear</td>
<td>Focal</td>
<td>Prescription Glasses</td>
<td>164.56</td>
<td>.659</td>
</tr>
<tr>
<td></td>
<td>Infrastructural</td>
<td>Anti-Scratch Proofing</td>
<td>46.50</td>
<td>.601</td>
</tr>
<tr>
<td>Air Travel</td>
<td>Focal</td>
<td>Ticket</td>
<td>249.53</td>
<td>.508</td>
</tr>
<tr>
<td></td>
<td>Infrastructural</td>
<td>In-Flight Entertainment</td>
<td>15.28</td>
<td>.401</td>
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<td>Theater</td>
<td>Focal</td>
<td>Ticket</td>
<td>97.43</td>
<td>.568</td>
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<td>Infrastructural</td>
<td>Booking Fee</td>
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<td>Focal</td>
<td>Car</td>
<td>54.73</td>
<td>.492</td>
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<td></td>
<td>Infrastructural</td>
<td>Insurance</td>
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<td>Focal</td>
<td>Ticket</td>
<td>8.19</td>
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<td></td>
<td>Infrastructural</td>
<td>Service Charge</td>
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<td>Shipping &amp; Handling</td>
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<td></td>
<td>Infrastructural</td>
<td>Joining Fee</td>
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<td>Room Rate</td>
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<td>.529</td>
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<td></td>
<td>Infrastructural</td>
<td>24-Hour Parking</td>
<td>24.09</td>
<td>.442</td>
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<tr>
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<tr>
<td></td>
<td>Infrastructural</td>
<td>Netting</td>
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<td>.640</td>
</tr>
</tbody>
</table>

* Participants were asked their willingness to pay for each component as well as the minimum and maximum price at which they would still consider purchasing. The adjusted variance measure is calculated by representing the price range (maximum – minimum) as a percentage of the mean WTP.

Participants were shown two purchase situations and told that they were interested in buying the product portrayed (the choice set included only one alternative). Each participant was then asked to rank three statements. “I consider this offer a good buy” (1 = “strongly disagree,” 9 = “strongly agree”). “Do you perceive this to be a good or bad deal?” (1 = “a very bad deal,” 9 = “a very good deal”). “The probability that I would buy from this seller is …” (1 = “very low,” 9 = “very high”). Appendix C replicates the stimulus used for the books category. The 250 participants in this study were members of the same subject pool who had not participated in either of the previous two studies. Other procedural steps were the same as for those studies.
TABLE 3: Component Price Ratios, CPR (Study 2).

<table>
<thead>
<tr>
<th>CPR type*</th>
<th>CDs</th>
<th>Books</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Focal</td>
<td>Infrastructural</td>
</tr>
<tr>
<td>H/L</td>
<td>$18</td>
<td>$1</td>
</tr>
<tr>
<td>WTP/WTP</td>
<td>$15</td>
<td>$4</td>
</tr>
<tr>
<td>L/H</td>
<td>$12</td>
<td>$7</td>
</tr>
<tr>
<td>LL/HH</td>
<td>$9</td>
<td>$10</td>
</tr>
<tr>
<td>LLL/HHH</td>
<td>$6</td>
<td>$13</td>
</tr>
<tr>
<td>Aggregated price</td>
<td>$19</td>
<td>$28</td>
</tr>
</tbody>
</table>

* To be read as follows:
WTP/WTP = price of both focal and infrastructural component set at WTP
LL/HH = price of focal component 2 levels below WTP/price of infrastructural component 2 levels above WTP

Results

The three dependent measures being highly correlated ($\alpha = .94$) as expected, the remainder of the analysis is based on an aggregate preference score. Given that both the within-subjects allocation of stimuli and use of product category as a covariate failed to reach significance in a one-way ANOVA, the data were also collapsed across replicates.

The first prediction was that, for the same total price, overall evaluation of a product would increase (decrease) monotonically as the ratio of component prices gradually increased (decreased). The pattern of results depicted in Figure 2 is consistent with this hypothesis. Statistically, a polynomial contrast revealed the expected linear effect ($F(5, 504) = 20.11, p < .001$). Four independent-sample $t$-tests explored the trend in detail: excepting the first, each increase in the CPR proved significantly higher than the previous one ($p = .431, p = .072, p = .001$, and $p = .056$, respectively).

Given this outcome, what (if anything) can be said about the comparison between aggregate and disaggregate pricing? Three findings stand out: aggregate pricing is preferred to disaggregate pricing when the CPR is higher than WTP/WTP; price format is irrelevant when the CPR is at WTP/WTP; and disaggregate pricing is preferred to aggregate pricing when the CPR is lower than...
WTP/WTP. To validate these findings we computed five planned contrasts, each anchored by the composite preference score obtained in the aggregate pricing condition. As hypothesized, participants evaluated the stimuli more favorably when the posted price was disaggregated and the infrastructural component priced below its WTP ($M_{H/L} = 5.05$ versus $M_{aggregate} = 4.25$; $t(174) = 2.47$, $p = .032$).

Conversely, for any CPR in which the infrastructural component was priced above its WTP the aggregated format led to higher product evaluations (e.g. $M_{LL/HH} = 2.68$ versus $M_{aggregate} = 4.25$; $t(174) = 4.85$, $p < .001$). There was no difference between price formats when the CPR was consistent with consumer price expectations ($M_{WTP/WTP} = 4.36$ versus $M_{aggregate} = 4.25$; $t(167) = -.32$, $p = .758$).

![FIGURE 2: Composite Preference Measure by Experimental Condition (Study 2).](image)

**Discussion**

The results of Study 2 reinforce our general framework that links price format to preference formation. In this experiment we concentrated on preferences under disaggregate pricing in order to test the prediction that infrastructural components become overly salient when assigned their own price in the transaction. The argument put forward to account for this effect is that for consumers infrastructural
components are more familiar and easy to evaluate than focal components. This leads consumers to concentrate their evaluation on the focal component under aggregate pricing and to assign (owing to more acute diagnosticity) an exaggerated weight to the infrastructural element when it is priced separately.

One limitation of this study is that the observed pattern of results is open to alternative explanations. First, decreasing product evaluations might be causally related to lower prices for the focal component if participants rely on price information to infer product quality (Rao and Monroe 1989). Second, if participants initially process infrastructural components as losses and focal components as gains, loss aversion would also predict overweighting of the former (Tversky and Kahneman 1991). Finally, it is plausible that the relationship between the CPR and consumer response is the consequence of a disparity in the internal coding of price differentials. The numerical cognition literature suggests that the psychological distance between them affects how numbers are processed (Dehaene 1992). Specifically, the magnitude effect indicates that, for equal numerical distance, it is easier to discriminate between small numbers (e.g., 1 versus 2) than large numbers (e.g., 8 versus 9). Given that focal components typically account for the majority of an expense, this logic implies that any deviation from the consumer’s WTP is likely to have a stronger impact on the evaluation of infrastructural components.

The following study attempts to rule out these alternative explanations by manipulating experimentally instead of inferring the diagnosticity of the infrastructural component. Doing so generates a set of predictions that, if confirmed, would be inconsistent with either of the competing accounts.
Study 3: The Impact of Diagnosticity on Component Weights

The main objective of this experiment is to verify that the weight of individual components following price disaggregation is, indeed, determined by their relative diagnosticity. To achieve the related goal of ruling out competing explanations compatible with the results of Study 2 we modify the experimental design used in that study to include component diagnosticity as an independent variable. We hypothesize a pattern of responses that is both consistent with and unique to our theory.

Predicted Effects

To manipulate diagnosticity the stimuli should be based on product categories for which the evaluation of either type of component is vague (e.g., trees and eyewear in Table 2). Starting from this “sterile” condition it is possible to capture the effect of diagnosticity on the relative weight of focal and infrastructural components. Specifically, for a total expense of constant value and a gradual increase in the price of the infrastructural component, overall product evaluations should (1) decrease monotonically when the infrastructural component alone is diagnostic (as in Study 2), (2) increase monotonically when the focal component alone is diagnostic, (3) remain constant when neither component is diagnostic, and (4) decrease when both components are diagnostic and either component is priced above the stated WTP (this inverted-U function is the result of loss aversion).

The advantage of manipulating diagnosticity is that the expected results are inconsistent with those predicted by all alternative explanations. Indeed, according to these accounts any increase in the price of infrastructural components should lead to lower product evaluations, irrespective of component diagnosticity.

Method

The experiment employed a 3 (CPR: H/L, WTP/WTP, L/H) × 4 (component diagnosticity: neither, focal only, infrastructural only, both) between-subjects design. The first factor, CPR, was replicated
from Study 2 but restricted, for simplicity, to only three levels: the WTP mean values collected in a pre-test (Table 2) and two price splits with each component offered both below and above the stated WTP. Total expense was again held constant across conditions. The second factor, component diagnosticity, was manipulated by adding component market prices to the stimuli when necessary. These prices were justified by experience with the category.

The layout of the stimuli, experimental procedure, and dependent measures were identical to those used in Study 2 save for the following changes. First, we drew from the pre-test in Study 2 to select the two product categories with the highest variance in component WTP. This criterion was used to ensure an efficient manipulation of component diagnosticity. The focal component of the first category was a Christmas tree (WTP: $40), the infrastructural component the netting ($6.50). In the second category the components were prescription glasses ($165) and anti-scratch proofing ($45), respectively. Second, participants were asked to indicate for each component, in addition to the three original preference measures, their WTP and degree of confidence in that assessment. Answers to the second question served as a manipulation check for component diagnosticity.

As in all previous experiments within-subjects allocation of stimuli to participants was such as to ensure no repetition and complete randomization of conditions. Participants were 553 members of the online subject pool. All other procedural steps dealing with selection and recruitment were the same.

Results

As was the case in Study 2, the three preference measures were highly correlated ($\alpha = .92$) and a composite preference score was calculated by averaging these values. An ANOVA with product

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6 For the tree replicate, the three CPR levels were set at $5 increments ($45/$1.50, $40/$6.50, and $35/$11.50). For the eyewear replicate this differential was $25 ($190/$20, $165/$45, and $140/$70).
category as a covariate and the allocation of stimuli as a within-subjects factor indicated that neither variable was statistically significant. For the main analysis the data were collapsed across replicates.

A series of planned contrasts verified that component diagnosticity was manipulated correctly. As expected, there was a significant discrepancy in the amount of uncertainty surrounding WTP estimates when only the focal ($M_{\text{focal}} = 5.67$ versus $M_{\text{infrastructural}} = 4.51$; $t(268) = 6.09, p < .001$) or infrastructural component ($M_{\text{focal}} = 4.95$ versus $M_{\text{infrastructural}} = 5.44$; $t(268) = -2.56, p = .011$) was diagnostic, but no such difference when neither ($M_{\text{focal}} = 4.83$ versus $M_{\text{infrastructural}} = 4.56$; $t(280) = 1.42, p = .155$) or both ($M_{\text{focal}} = 5.61$ versus $M_{\text{infrastructural}} = 5.44$; $t(279) = .93, p = .352$) components were diagnostic.

The key results of this experiment are summarized in Figure 3. Overall, the effect of component diagnosticity on preferences is consistent with the proposed framework, producing a pattern of results that contradicts any of the competing explanations that surfaced in the discussion of Study 2. First, when both focal and infrastructural components were diagnostic product evaluations peaked as component prices matched participants’ initial WTP. A polynomial contrast confirmed the expected quadratic effect ($M_{H/L} = 5.45, M_{WTP/WTP} = 6.04$, and $M_{L/H} = 5.14$; $F(2, 278) = 4.34, p = .006$), with independent-sample $t$-tests showing a significant difference between the first and second ($t(191) = -1.94, p = .053$) and second and third CPR levels ($t(179) = 2.88, p = .004$).

Second, linear trends were observed when either the focal or infrastructural component was diagnostic. In the former case, product evaluations gradually improved as the price of the focal component decreased ($M_{H/L} = 4.49, M_{WTP/WTP} = 5.36$, and $M_{L/H} = 6.17$; $F(2, 267) = 19.95, p < .001$). In the latter case, however, preferences steadily degenerated over the same range of component prices ($M_{H/L} = 5.80, M_{WTP/WTP} = 5.26$, and $M_{L/H} = 3.55$; $F(2, 267) = 30.38, p < .001$). Finally, and again as predicted by our framework, alternative ways to partition an expense had no apparent effect on
perception of value when neither component was diagnostic ($M_{H/L} = 4.97$, $M_{WTP/WTP} = 5.28$, and $M_{L/H} = 5.29$; $t_{H/L vs. WTP/WTP}(180) = -1.04$, $p = .298$; $t_{WTP/WTP vs. L/H}(192) = .05$, $p = .962$; $t_{H/L vs. L/H}(186) = -1.11$, $p = .270$).

![FIGURE 3: Composite Preference Measure by Experimental Condition (Study 3).](image)

Discussion

This experiment establishes the direct causal link between component diagnosticity and the relative salience of components in evaluation that was absent in Study 2. Specifically, we have demonstrated perception of value to be biased towards component evaluations that are held with greater certainty. This bias is significant because it generates preferences that are often inconsistent with the principle that component weights should reflect relative monetary worth. Additionally, we have been able to provide support for this association and simultaneously rule out a number of alternative explanations.
On a broader scale, it is important to note that each of the first three studies has drawn conclusions about inconsistencies in the evaluation and integration of components by observing discrepancies in aggregate product-level preferences. With that in mind, we argue that a more definitive test of the proposed theory would involve analysis of the phenomenon directly at the component level. To that end, the purpose of Study 4 is to decompose preferences as suggested.

**Study 4: Predicting Consumer Response Using Component-Level Evaluations**

In the previous studies consumers were evaluating a multicomponent good as a whole and variations in their evaluations suggested that the weighting of focal and infrastructural components was influenced by price format. In the present study, instead of inferring the presence of price format-dependent component weights we directly elicit the value of the separate components to test our theory’s prediction about the presence of a bias in the way component evaluations are combined to produce a product-level evaluation. According to the proposed framework the relative weight assigned to each component should depend on price format. When the price is aggregated we predict greater weight on the focal element. Conversely, disaggregate pricing leads to accentuation of the infrastructural component’s valuation.

For each price format the present study elicits both component and overall product evaluations. Four simple rules-of-thumb (‘algorithms’) are used to combine component evaluations (see Table 4). We hypothesize that the impact of price format on product evaluation will be better captured when aggregation is biased towards the infrastructural component in the presence of a disaggregated price. In other words, the algorithms’ ICO (score based on the infrastructural component only) and EW (equal weighting of components) will capture the impact of price format more accurately than the FCO (score based on the focal component only) and MVW (weighting according to monetary worth).
### Method

The experiment employed a 2 (price format: aggregate vs. disaggregate) × 2 (product evaluation: actual vs. calculated) between-subjects design. Each participant was asked to evaluate two product categories, a DVD rental and a cell phone service. As in all previous experiments within-subjects allocation of stimuli was randomized and duplicated conditions were ruled out. Infrastructural components were incoming and out-going shipping and handling and roaming and interstate connection (Appendix D replicates the scenario used in the cell phone service stimulus), respectively. For each scenario participants were asked to rate the attractiveness of one offer using a 10-point scale (1 = “highly unattractive,” 10 = “highly attractive”). Depending on the condition, price information was aggregated or disaggregated and participants rated either the overall product or each of the three components individually. The 141 participants were recruited from the same subject pool according to the same procedure discussed previously.

### Results

Prior to analyzing the data the individual component evaluations were integrated according to the importance weights specified by each of the algorithms in Table 4. The four calculated preference scores were then used in the ANOVA as one level of the product evaluation factor. A preliminary analysis found no significant effect for within-subjects allocation of replicates. Including product

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**TABLE 4: Algorithms for Integrating Individual Component Evaluations (Study 4).**

<table>
<thead>
<tr>
<th>Algorithm Type</th>
<th>Label</th>
<th>Weight of Focal Component</th>
<th>Weight of 1st Infrastructural Component</th>
<th>Weight of 2nd Infrastructural Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focal Component Only</td>
<td>FCO</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Monetary Value Weighting</td>
<td>MVW</td>
<td>.834</td>
<td>.083</td>
<td>.083</td>
</tr>
<tr>
<td>Equal Weighting</td>
<td>EW</td>
<td>.34</td>
<td>.33</td>
<td>.33</td>
</tr>
<tr>
<td>Infrastructural Component Only</td>
<td>ICO</td>
<td>0</td>
<td>.5</td>
<td>.5</td>
</tr>
</tbody>
</table>

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27
category as a covariate also failed to achieve significance, hence, the data were collapsed across replicates.

A separate ANOVA was conducted for each of the four algorithms tested (see Figure 4). Both the FCO and MVW distributions that placed greater emphasis on the focal component produced calculated preference scores that were inconsistent with actual product evaluations (FCO: $M_{\text{FCO}} = 6.19$ versus $M_{\text{actual}} = 5.41$, $F(1, 136) = 4.51$, $p = .036$; MVW: $M_{\text{MVW}} = 6.08$ versus $M_{\text{actual}} = 5.41$, $F(1, 136) = 3.59$, $p = .060$). This was the case, however, only when the price of the stimulus was disaggregated. Under aggregate pricing the outcome was reversed and calculated scores provided a good approximation of product-level preferences (FCO: $M_{\text{FCO}} = 5.72$ versus $M_{\text{actual}} = 5.57$, $F(1, 136) = 1.33$, $p = .692$; MVW: $M_{\text{MVW}} = 5.75$ versus $M_{\text{actual}} = 5.57$, $F(1, 136) = 2.09$, $p = .635$).

FIGURE 4: Composite Preference Measure by Experimental Condition (Study 4).
The performance of the two algorithms that assigned greater importance to the infrastructural components (EW and ICO) was the mirror image. Under aggregate pricing these distributions of component weights led to calculated preference scores that did not match actual product evaluations (EW: $M_{EW} = 6.19$ versus $M_{actual} = 5.57$, $F(1, 135) = 5.23$, $p = .024$; ICO: $M_{ICO} = 6.35$ versus $M_{actual} = 5.57$, $F(1, 135) = 6.94$, $p = .009$). Again, this result was not consistent across price formats. When the posted price was disaggregated these algorithms generated evaluations that were indistinguishable from product-level preferences (EW: $M_{EW} = 5.83$ versus $M_{actual} = 5.41$, $F(1, 136) = .68$, $p = .411$; ICO: $M_{ICO} = 5.88$ versus $M_{actual} = 5.41$, $F(1, 136) = 2.10$, $p = .365$).

Discussion

Study 4 highlights the stark contrast in preference formation caused by a simple, objectively meaningless change in price format. Importantly, it provides a more direct test of the proposed model by taking the component as the main unit of analysis. The predicted shift in component weights was confirmed by comparing actual and calculated product evaluations. Consumers appear to anchor their evaluations of infrastructural components if the posted price is disaggregated. An aggregated price, on the other hand, leads consumers to adopt the focal component as the central (if not exclusive) point of reference.

Study 5: Product Structure as a Boundary Condition

This research has shown all-inclusive prices to lead to product evaluations based exclusively on the merits of the focal component. To explain this result we have argued that the mismatch between the number of components and prices makes the appraisal of individual components effortful and, as a consequence, that consumers simplify the evaluation process by focusing exclusively on the most relevant factor.
Implicit in this line of reasoning is an association between price format and product structure that can potentially act as a boundary condition that limits the generalizability of our results. The relevant question, in this case, is whether consumers would invest sufficient cognitive effort in assessing their preferences if the original infrastructural component was replaced by an additional focal component. According to the present research, price format should be irrelevant in these circumstances. This study tests this proposition.

**Method**

This final experiment used a 2 (price format: aggregate, disaggregate) × 2 (perceived value of second component: good deal, bad deal) × 2 (type of second component: infrastructural, focal) between-subjects design. Participants were asked to evaluate a single purchase scenario involving cable TV service (the focal component) and a second component that was either the box and remote control hire (infrastructural) or telephone service (focal). Control of the second component was achieved by specifying in the stimulus that the participant was interested in contracting *both* the cable television and telephone service (see Appendix E). The posted price was $58.75 or $47.50 + $11.25 depending on price format. The perceived value of the second component was manipulated by varying the quality of the benefit provided.

Participants were asked to read the scenario and evaluate the offer on three dimensions (using the same preference scales as in Studies 2 and 3). Manipulation checks carried out on the second component included (a) measuring its perceived value using a scale from -3 (“very unattractive”) to 3 (“very attractive”) and (b) measuring its relative importance on two 1-7 scales (see Appendix E). The 365 participants in this experiment were members of the same subject pool used in the previous studies. The experiment was conducted online and a $5 remuneration paid upon completion. Other procedural steps dealing with selection and recruitment were unchanged from the earlier experiments.
Results

We begin with the manipulation checks. An independent-sample t-test indicated that the perceived value of the second component was manipulated as intended ($M_{\text{good deal}} = .57$ versus $M_{\text{bad deal}} = -.93$; $t(363) = 6.88$, $p < .001$) and the two measures of component importance were sufficiently correlated to be collapsed into one aggregate scale ($\alpha = .82$). As expected, a t-test revealed the telephone service ($M_{\text{focal}} = 4.15$) to be considered more central than the box and remote control hire to participants’ needs ($M_{\text{infrastructural}} = 3.66$; $t(363) = 2.41$, $p = .017$).

The main analysis was conducted using ANOVA and planned orthogonal contrasts. An ANOVA on the composite preference measure ($\alpha = .95$) indicated that product evaluations were affected by the perceived value ($M_{\text{good deal}} = 6.20$ versus $M_{\text{bad deal}} = 4.40$; $F(1, 363) = 62.59$, $p < .001$) and type ($M_{\text{infrastructural}} = 4.92$ versus $M_{\text{focal}} = 5.67$; $F(1, 363) = 10.98$, $p = .001$) of the second component. These effects were qualified, however, by significant two-way (second component perceived value × type; $F(1, 361) = 23.96$, $p = .024$) and three-way ($F(1, 357) = 19.63$, $p = .041$) interactions.

Our framework predicts that price format should affect preferences only when focal and infrastructural components are paired. When two focal components are brought together product evaluations are expected to improve as the perceived value of the second component increases, irrespective of price format. The planned comparisons on preferences for the focal plus infrastructural bundle showed a similar interaction to that seen in Study 1 (Figure 5, left diagram). A change in the perceived value of the second component was significant under disaggregate ($M_{\text{disaggregate/good deal}} = 5.96$ versus $M_{\text{disaggregate/bad deal}} = 3.86$; $t(87) = 5.00$, $p < .001$) but not under aggregate ($M_{\text{aggregate/good deal}} = 5.16$ versus $M_{\text{aggregate/bad deal}} = 4.71$; $t(89) = 1.09$, $p = .277$) pricing. For an attractive second component
disaggregate pricing led to a more favorable evaluation ($t(84) = 1.86, p = .064$). This result was reversed when the second component was perceived to be unappealing ($t(92) = 2.08, p = .039$).

When two focal components were paired this interaction vanished (Figure 5, right diagram). In this case, the perceived value of the second component affected not only preferences formed under disaggregate ($M_{\text{disaggregate/good deal}} = 6.56$ versus $M_{\text{disaggregate/bad deal}} = 4.35$; $t(91) = 4.54, p < .001$) but also those formed under aggregate ($M_{\text{aggregate/good deal}} = 7.10$ versus $M_{\text{aggregate/bad deal}} = 4.69$; $t(90) = 5.00, p < .001$) pricing. As a consequence, price format had no significant impact on product evaluations as the perceived value of the second component was varied ($t_{\text{good deal}}(79) = 1.07, p = .288$; $t_{\text{bad deal}}(102) = .74, p = .461$).

FIGURE 5: Composite Preference Measure by Experimental Condition (Study 5).

When two focal components were paired this interaction vanished (Figure 5, right diagram). In this case, the perceived value of the second component affected not only preferences formed under disaggregate ($M_{\text{disaggregate/good deal}} = 6.56$ versus $M_{\text{disaggregate/bad deal}} = 4.35$; $t(91) = 4.54, p < .001$) but also those formed under aggregate ($M_{\text{aggregate/good deal}} = 7.10$ versus $M_{\text{aggregate/bad deal}} = 4.69$; $t(90) = 5.00, p < .001$) pricing. As a consequence, price format had no significant impact on product evaluations as the perceived value of the second component was varied ($t_{\text{good deal}}(79) = 1.07, p = .288$; $t_{\text{bad deal}}(102) = .74, p = .461$).
Discussion

The main objective of this experiment was to demonstrate an important limitation of the influence of price format on perceptions of value. To this end, we have shown price format to have no significant effect on the evaluation of a second component that assumes an important role in addressing a participant’s needs. This result supports the broader proposition that aggregate pricing leads to heuristic processing only when an infrastructural component is present. Replacing this peripheral element with one that is more central to consumers provokes a thorough, judicious consideration of the product that is unlikely to ignore any potential benefit or detriment, irrespective of size.

General Discussion

The principal objective of this paper was to systematically investigate the link between price format and consumer preference and to suggest a simple mechanism that jointly explains this contingency. Earlier research offered conflicting conclusions, some researchers claiming that disaggregated prices increased demand by exploiting inconsistencies in the way consumers form their preferences, others emphasizing the negative effect of price partitioning on the perceived expense.

Our five studies support the general hypothesis that consumer preference is affected by price format. Moreover, the observed direction of this impact is consistent with our suggested mechanism. Preferences are generally insensitive to variations in the perceived value of infrastructural components presented with an aggregated price that seems to have the effects of inducing consumers to concentrate on the focal component of the offer. In contrast, disaggregate pricing leads consumers to account for the deal obtained with respect to the infrastructural component. Because the infrastructural component usually benefits from superior diagnosticity, consumers presented with a disaggregated price will place an exaggerated weight on their evaluation of the infrastructural component. Our results show how this
simple mechanism is sufficient to determine whether aggregate or disaggregate pricing leads to greater perceived value. Moreover, by testing some of the more peculiar implications of this mechanism we were able to rule out a number of alternative explanations.

Study 1 reveals that alternative descriptions of the same terms of exchange produce systematically evaluative judgments by affecting the relative salience of an infrastructural component. Studies 2 and 3 build on this basic finding by examining the impact of allocating a fixed total expense differentially across components. Study 2 highlighted the bias towards infrastructural components in the presence of disaggregate pricing, showing preference to decrease monotonically as the cost of the infrastructural component increases despite a compensating reduction of the price attached to the focal component. Study 3 refines this finding and rules out alternative explanations by manipulating component diagnosticity directly and generating a pattern of results that is inconsistent with any competing account.

Study 4 is a more straightforward test of the underlying mechanism that measures the valuation of each component directly and combines these valuations according to specifications compatible with our framework in order to demonstrate the fit between actual and predicted evaluations. Finally, Study 5 tests an important boundary condition, confirming that price format becomes irrelevant when an infrastructural component is replaced by an additional focal element.

The experimental results reveal price to be important not only because of the direct disutility it provides, but also because of its indirect effect on the way consumers perceive product benefits. More specifically, consumer research typically assumes price to be an objective, sterile attribute the tangible nature of which precludes meaningful interaction with other product attributes and information processing. This work makes the additional argument that pricing can affect as much as capture
perceived value: our results are consistent with recent efforts that view price as a stimulus or incentive for consumers to consider the full set of contingencies implied by their choices (Shiv, Carmon, and Ariely 2005; Wathieu and Bertini 2005).

With respect to previous work on price partitioning, the main contribution of this paper is its detailed account of consumer response to alternative ways of framing price information, which parsimoniously resolves some of the methodological and theoretical ambiguities present in the existing literature. An important objective was to identify a single mechanism that could account for the presence of both disaggregate and aggregate pricing in practice.

Finally, this paper offers clear and specific recommendations for practice. Research has demonstrated that consumers form rich inferences about firms’ intentions from their behavior (e.g. Kahneman, Knetsch, and Thaler 1986). Two factors that clearly influence these conclusions are the way products and prices are presented in the market. This paper presents one account of how these variables might interact to shape perceptions by showing price format to be an effective means of channeling consumers’ attention from one type of component to another. Firms that market differentiated focal components should mask irrelevant infrastructural benefits by posting aggregated prices (price together to hide futility). Conversely, firms that offer a commoditized product might well consider disaggregated prices if the infrastructural component is attractive (price separately to derail attention).

Although this research emphasizes an information processing perspective, we recognize the multidimensional nature of the topic and likelihood that other factors or interpretations also influence the relationship between price format and preference formation. In particular, whereas our framework relies on differences in the relative salience of components to motivate the analysis, related issues such as fairness, expectations, and sunk costs might also be relevant. Future research could extend this line
of investigation by incorporating some or all of the above concerns. That said, it is our opinion that alternative interpretations should remain sufficiently flexible to account for the presence of both aggregate and disaggregate pricing in practice.
APPENDIX A: Sample Stimulus (Study 1, Air Travel Replicate).
(experimental conditions in italics)

Imagine that you need to buy a one-way ticket for a trip from Boston to San Juan. For the departure date you want, only two well-known airlines cover this route. Airline A does not offer direct service between the two cities. Details and fare information for Airline A are as follow.

Depart Boston, 12:15pm - Arrive Atlanta, 4:09pm (duration 2hr 54m)
Depart Atlanta, 4:50pm - Arrive San Juan, 8:04pm (duration 3hr 14m)
Price: $165

Airline B does offer direct non-stop service between Boston and San Juan. Flight and fare information for Airline B are as follow (total price is itemized below).

Depart Boston, 11:55am - Arrive San Juan, 4:10pm (Duration 4hr 15m)
Price: $215 including in-flight entertainment (6 movie channels) and a full-service meal
$205 + $10 for in-flight entertainment (6 movie channels) and a full-service meal
$215 including in-flight entertainment (1 episode of a sitcom) and refreshments (coffee or tea)
$205 + $10 for in-flight entertainment (1 episode of a sitcom) and refreshments (coffee or tea)

Please answer the following questions.

1. Which airline will you fly with? (1 = definitely Airline A; 8 = definitely Airline B)
2. Please rate the attractiveness of each offer.
   Airline A (1 = very unattractive; 7 = very attractive)
   Airline B (1 = very unattractive; 7 = very attractive)
3. Please rate the attractiveness of the in-flight entertainment and meal service in this scenario.
   (-3 = very unattractive; 3 = very attractive)
APPENDIX B: Sample Stimulus (Study 1, Extension 2, Groceries Replicate).

*(experimental conditions in italics)*

In the following situation we are interested in understanding your response to alternative ways of presenting price information. The alternatives described below are equivalent in terms of total price but differ in how the price is broken up. Think about how you would react if you were facing this situation, then answer the accompanying questions.

An online grocer is considering an increase in the overall price of its service. The store has a good reputation, wide selection of products, and reliable service. Most customers …

... have work commitments such that it is very hard for them to be home in time to receive deliveries if the time slot is narrow.
... work from home and therefore don’t really have any problem with delivery times.

The management team is considering two ways to present this price increase. The shopping basket (i.e., the groceries purchased) is the same in each case. The only thing that changes is how the price is itemized.

Original Format: $149
New Format 1: $164
New Format 2: $164 including a scheduling fee
   $155 plus a $9 scheduling fee

(The delivery van waits for a maximum of two hours. The scheduling fee contributes to the cost of receiving flexible time slots.)

Please answer the following questions.

1. Would the likelihood of buying groceries from this store change if the price was presented to you using Format 2 instead of Format 1?
   (1 = definitely less likely to buy, 8 = definitely more likely to buy)

2. In your opinion, which new format makes the price change look more appealing?
   (1 = definitely Format 1, 8 = definitely Format 2)

3. Given the type of customer who usually buys from this store, how attractive is offering flexible time slots?
   (-3 = very unattractive, 3 = very attractive)
APPENDIX C: Sample Stimulus (Study 2, Books Replicate).

(experimental conditions in italics)

Imagine that you are interested in buying the new book by your favorite author. The book, a hardcover novel, is currently on the bestseller list. The online store you usually buy books from offers this book for ...

... $28 dollars, including standard shipping and handling (5-10 business days).
... $27 dollars, plus a $1 charge for standard shipping and handling (5-10 business days).
... $24 dollars, plus a $4 charge for standard shipping and handling (5-10 business days).
... $21 dollars, plus a $7 charge for standard shipping and handling (5-10 business days).
... $18 dollars, plus a $10 charge for standard shipping and handling (5-10 business days).
... $15 dollars, plus a $13 charge for standard shipping and handling (5-10 business days).

Please answer the following questions.

1. Evaluate this statement: “I consider this offer a good buy.”
   (1 = strongly disagree, 9 = strongly agree)
2. Do you perceive this to be a good or bad deal?
   (1 = a very bad deal, 9 = a very good deal)
3. The probability that I would buy from this seller is …
   (1 = very low, 9 = very high)
You decided to buy a cell phone in order to be more in touch with both family and work when you travel. You figure that all you need is a simple plan, although you are apprehensive about the fact that because you are away often you might have to pay roaming charges when you are outside your calling zone. Prices for most service contracts range between $30 and $60 per month depending on the number of minutes you purchase. The plan you are thinking about, which includes sufficient minutes, is sold by a reputable carrier for …

... $45 per month excludes 2 other fees, each for $4.50, ...
... $54 per month includes 2 other fees ...

… charged as flat rates for any roaming and interstate connection costs a customer might incur during the month.

Please answer the following question.

1. Please evaluate the …
   ... attractiveness of each of the items that make up this offer.
   … overall attractiveness of this offer.
   (1 = highly unattractive, 10 = highly attractive)
APPENDIX E: Sample Stimulus (Study 5).
(experimental conditions in italics)

Consider the following situation.

You just finished moving into a new apartment. Now that all the furniture is in place you would like to take care of the various services such as cable television, Internet, and telephone. You plan to make a few calls (using your cell phone) to schedule appointments with the respective providers. First on your list is cable television. You call the local cable company and the sales assistant explains that among their products is a standard package that features the most popular cable networks plus all local channels for ...

... $58.75. Included in this package price is a basic home telephone service that assigns the user a dedicated line and phone number but does not cover the cost of any phone calls made.
... $58.75. Included in this package price is an advanced home telephone service that covers unlimited local and long distance calling as well as call waiting.
... $58.75. Included in this package price is the rental of a refurbished analog set-top box and an entry-level remote control.
... $58.75. Included in this package price is the rental of a high-definition digital set-top box and a multi-function remote control.
... $47.50, plus an additional (required) $11.25 for a basic home telephone service that assigns the user a dedicated line and phone number but does not cover the cost of any phone calls made.
... $47.50, plus an additional (required) $11.25 for an advanced home telephone service that covers unlimited local and long distance calling as well as call waiting.
... $47.50, plus an additional (required) $11.25 for the rental of a refurbished analog set-top box and an entry-level remote control.
... $47.50, plus an additional (required) $11.25 for the rental of a high-definition digital set-top box and a multi-function remote control.

Please answer the following questions.

1. Evaluate this statement: “I consider this offer a good buy.”
   (1 = strongly disagree, 9 = strongly agree)
2. Do you perceive this to be a good or bad deal?
   (1 = a very bad deal, 9 = a very good deal)
3. The probability that I would buy from this seller is …
   (1 = very low, 9 = very high)
4. Considering the information provided in this scenario, please rate the [home telephone service] [set-top box and remote control hire] according to the role it plays in satisfying your current needs.
   (1 = this component plays a SUPPLEMENTARY role, 7 = this component plays a FOCAL role)
5. Evaluate the following statement: “I consider the [home telephone service] [set-top box and remote control hire] to be a focal component of the offer.”
   (1 = strongly disagree, 7 = strongly agree)
6. Please rate the overall attractiveness of the [home telephone service] [set-top box and remote control hire] component.
   (-3 = not at all attractive, 3 = very attractive)
References


