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EDITED BY

Emin Karagözoğlu,
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REVIEWED BY

Francisco Guzman,
Monterrey Institute of Technology and
Higher Education (ITESM), Mexico
Gustavo Schneider,
Salisbury University, United States

*CORRESPONDENCE

Yannik A. Escher
✉ yannik.escher@leuphana.de

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How consumers evaluated precise, just-below, and round prices: evidence from two high- powered, preregistered experiments

Yannik A. Escher*, Eve Sarah Troll, Marie-Lena Henjes and
David D. Loschelder

School of Management and Technology, Leuphana University Lüneburg, Lüneburg, Germany

Round, just-below (e.g., 9.99), and precise (e.g., 9.87) prices are widespread in consumer markets, yet evidence on their psychological effects remains inconclusive, at times even contradictory, and heavily concentrated on the contrast between just-below and round prices. Recent work further shows that these price endings differ systematically in their prevalence across countries, underscoring the need to understand the consumer-level mechanisms that may make them effective in the first place. Across two preregistered, high-powered experiments (total $N = 729$), we therefore examined how round, just-below, and precise prices shape purchase intentions, price image, quality image, and price recall. Across studies, precise prices produced the most favorable price image and were most likely to be underestimated in recall, followed by just-below prices and then round prices. By contrast, price endings did not reliably affect quality image or purchase intentions. Exploratory mediation analyses suggest that the relative advantage of precise prices operates through price image rather than quality image or recall-based underestimation. These findings identify behavioral foundations of price-ending effects at the level of individual consumer judgment and complement recent macro-level evidence on cross-cultural differences in the prevalence of round, just-below, and precise prices.

KEYWORDS

just-below prices, precise prices, price endings, pricing, round prices

Introduction

Price endings are a pervasive feature of consumer markets. While just-below, 9-ending prices are highly prevalent (e.g., \$9.99; [Hung et al., 2021](#); [Madrigal et al., 2025](#); [Martínez-Ruiz et al., 2006](#)), precise (\$9.87) and round prices (\$10.00) comprise less common pricing strategies. Recent evidence suggests that these endings also differ systematically in their prevalence across real-world E-commerce settings and across countries ([Ventura et al., 2025](#)). Yet consumer research has focused mainly on the contrast between just-below and round prices, often assuming that just-below prices increase demand ([Levy et al., 2020](#); see [Troll et al., 2024](#), for a meta-analytical review). Empirical findings, however, remain mixed and inconclusive: while some studies report positive effects of just-below over round prices (e.g., [Banerjee et al., 2016](#); [Choi et al.,](#)

2014), others report null or even reversed effects (e.g., Allred et al., 2010; Carver and Padgett, 2012; Kurz et al., 2023; Wieseke et al., 2016). These mixed findings may result from opposing positive and negative effects of just-below prices (Troll et al., 2024).

Two broad accounts have been proposed to explain price-ending effects. First, *level effects* assume that consumers underestimate the magnitude of certain prices, especially just-below prices relative to round prices (Manning and Sprott, 2009). Second, according to *image effects*, just-below prices signal that a price is discounted but also of lower product quality (Schindler, 2006; Schindler and Kibarian, 2001). Accordingly, price endings may shape not only consumers' purchase intentions, but also the price image, quality image, and price recall (Chan, 2022).

The sole comparison of just-below vs. round prices is incomplete, however. A broader literature on numerical precision shows that precise numbers shape decision-making (Schultze and Loschelder, 2021), estimations (Janiszewski and Uy, 2008), negotiations (Loschelder et al., 2014; Yan and Pena-Marin, 2017), or dieting and goal setting (Frech et al., 2020, 2022). In the pricing domain, by contrast, precise prices have received comparatively little attention in recent years—showing both negative and positive effects so far (Cui et al., 2021; Kim et al., 2020).

Following Wieseke et al. (2016), we refer to 9-ending prices as 'just-below' prices (e.g., \$3.99 instead of \$4.00, or \$19.95 vs. \$20.00; Gonçalves et al., 2025). We use the term 'precise price' for prices with non-zero trailing digits (e.g., \$9.87 or \$10.13 instead of \$10.00; Dogerlioglu-Demir et al., 2022; Loschelder et al., 2017), whereas prices ending in one or more trailing zeros (e.g., \$4.00 or \$4.40) are denoted as round prices. While other strands of the literature have operationalized 9-ending prices as precise prices (Pena-Marin and Yan, 2021; Yan and Pena-Marin, 2017), we distinguish just-below from precise prices because the former are defined by threshold-adjacent charm-pricing cues (i.e., lying close to and 'just-below' a salient round price), whereas the latter are intended to convey exactness, calculation, accuracy, and specificity (Loschelder et al., 2014; Mason et al., 2013; Peev and Mayer, 2017; Thomas et al., 2010).

Theoretical accounts and extant empirical evidence

We shall briefly outline two prominent theoretical accounts for psychological price-ending effects. *Level effects* (also labeled 'underestimation effects'; Manning and Sprott, 2009; Thomas and Morwitz, 2005) attempt to explain why two prices of essentially the same amount (\$14.99 and \$15.00) are psychologically perceived as considerably different (Baumgartner and Steiner, 2007; Carver and Padgett, 2012; Wieseke et al., 2016). Three lines of reasoning are relevant: First, consumers round prices down to the next lower whole amount (\$14.99 as \$14.00; Bizer and Schindler, 2005). Second, consumers compare the digits of a price one by one and stop this comparison as soon as a difference is encountered [comparison between \$14.99 and \$15.00 stops after the second digit (4 vs. 5); Thomas and

Morwitz, 2005]. Third, consumers minimize cognitive effort by memorizing particularly the leftmost digit(s) of a price, which carries the highest monetary value (\$14.99 is remembered as \$14 "plus something"; Schneider et al., 2025; see also Sokolova et al., 2020). All these cognitive processes are interrelated but consistently lead to a substantial underestimation of the just-below vs. round price. A recent meta-analysis by Troll et al. (2024) found a moderate meta-analytical underestimation effect [$g = 0.67$, $CI_{95\%} (0.04, 1.30)$] for just-below compared to round prices.

According to *image effects*, consumers infer meaning from different price endings that signal distinct price and quality images (Schindler, 2006; Weisstein et al., 2013). First, a just-below price signals the price image that the respective product is on sale or that this is the lowest price on the market (Schindler and Kibarian, 2001). In contrast, quality image effects would assume that a just-below price signals lower product quality than a round price (Schindler and Kibarian, 2001). As suggested by cue-utilization theory, consumers use prices as cues for judging the product's quality (Jaikumar, 2018; Krishnamoorthy and Sainam, 2025; Wang et al., 2022) and have internalized the positive relationship between price magnitude and perceived quality ($r = .286$; for a meta-analysis, see Völckner and Hofmann, 2007). In stark contrast to price image effects, quality image effects assume a beneficial effect of round over just-below prices. In sum, there is more empirical support for price image effects than for quality image effects (see Troll et al., 2024, for a meta-analytic summary). Based on this theorizing, we hypothesized:

Hypothesis 1. Just-below (vs. round) prices will lead to higher purchase intention, better price images, worse quality images, as well as more underestimated and less accurate price recall.

The third, massively under-researched category of price endings is that of precise prices. In the last decade, precise price endings became increasingly common. Numeric precision has been shown to affect human decision making in various contexts (e.g., Frech et al., 2022; Janiszewski and Uy, 2008; Jha et al., 2024; Kim et al., 2020; Loschelder et al., 2014; Schultze and Loschelder, 2021; Thomas et al., 2010). Following research from negotiations (Loschelder et al., 2014, 2016), an advertiser who sells a product at a precise price should send a strong signal about the accuracy of the price; potential buyers should assume that the price more accurately reflects the true value of the product (Beracha and Seiler, 2014; see also Kalyanaram and Winer, 2022). Following this attribution-of-competence theorizing, we therefore hypothesized:

Hypothesis 2a. Precise (vs. round) prices will lead to higher purchase intention, more favorable price images, and more favorable quality images.

Other precision research, however, suggests diametrically opposed predictions: Round prices with trailing zeros are more fluently processed than precise ones, which elicits the experience of "feeling right" (Wadhwa and Zhang, 2015). The processing-fluency theory (Reber et al., 2004) suggests that consumers prefer round over precise prices. For example, Wadhwa and Zhang (2015) propose that round (vs. non-rounded) prices "feel right" and thus lead to particularly positive (emotional)

TABLE 1 Overview of preregistered predictions.

Comparison	Preregistration status	Hypothesis
H1: Round vs. just-below prices	Confirmatory	Just-below (vs. round) prices were predicted to lead to higher purchase intention, more favorable price image, less favorable quality image, and greater underestimation/worse recall than round prices.
H2a: Round vs. precise prices	Preregistered exploratory (competing hypothesis)	Attribution-of-competence theorizing predicts precise (vs. round) prices lead to higher purchase intention, more favorable price images, and more favorable quality images.
H2b: Round vs. precise prices	Preregistered exploratory (competing hypothesis)	Processing-fluency theorizing predicts that round (vs. precise) prices lead to higher purchase intention, more favorable price images, more favorable quality images, and better recall accuracy.
Precise vs. just-below prices	Preregistered exploratory (undirected hypothesis)	We explored whether precise and just-below prices differ in purchase intention, price image, quality image, and recall-related outcomes, as there is no sufficiently clear directional basis in the literature.

Preregistered hypotheses concerned the comparison between (1) just-below versus round prices, derived from the established literature on level effects and image effects, and between (2) precise versus round prices, derived from attribution-of-competence theorizing and processing-fluency theorizing. Predictions involving precise prices were preregistered as exploratory because the literature implied competing directional expectations.

responses and purchasing behavior.¹ In contrast to the attribution-based theorizing detailed above and based on processing-fluency theorizing, we therefore hypothesized:

Hypothesis 2b. Round (vs. precise prices) prices will lead to higher purchase intention, more favorable price images, more favorable quality images, and better recall accuracy.

The present research examines these competing theoretical predictions (Hypothesis 2a vs. Hypothesis 2b), which were preregistered as exploratory tests (see Table 1).

This question is especially timely in light of recent evidence that round, just-below, and precise prices differ systematically in their marketplace prevalence across countries (Ventura et al., 2025).² They document macro-level differences in the use of these price endings in E-commerce, and the present research complements that work by testing the behavioral foundations of how individual consumers perceive, recall, and evaluate these same price formats. In other words, if different price endings are used differently across markets, it is important to understand the consumer-level mechanisms that may make these formats more or less attractive.

The present research—overview and contribution

This research advances the field in three ways: First, considering the inconclusive evidence for just-below vs. round prices, we provide preregistered and high-powered³ tests of price-ending effects, which are particularly valuable in a literature marked by mixed findings (Troll et al., 2024). Second, to our knowledge, there is no previous study that has simultaneously examined (or reported) the effects of price endings on central dependent variables in this literature. In contrast to prior studies that focused on selected dependent variables, we examine four key outcomes within the same experimental paradigm: (1) purchase intention, (2) price image, (3) quality image, and (4) price recall. Third, we integrate research on just-below vs. round prices with work on numerical precision, thereby testing consumer responses to three price endings that are all relevant in real-world markets (Ventura et al., 2025).

Study 1

Study 1 provided the initial test of how round, just-below, and precise prices affect purchase intention, price image, quality image, and price recall.

Method

All experimental methods, original data, analyses scripts, and additional material are publicly available on the Open Science

¹This phenomenon, known as the “rounded price effect”, particularly intensifies consumer reactions toward the target product when the purchase decision is determined by feelings (and less by cognition; Wadhwa and Zhang, 2015).

²When focusing on the very last digit, most prices in the United States end in the digit 9 (69%), while the second most prevalent digit is 5 (12%; Levy et al., 2011; see Ventura et al., 2025). We conducted a pre-study, analyzing a total of 12,496 prices on Amazon, eBay, and common supermarkets in the U.S. and Germany: this showed considerable prevalence of just-below (66.18%) and round (11.08%), but also precise (22.74%) prices. Using the web scraping method (Bradley and James, 2019) we extracted price information from U.S. American and German sales homepages. On eBay and Amazon we collected price information for several products (i.e., lamp, toothbrush, backpack, shampoo, sofa, headphones). On the supermarket homepages (i.e., HEB in the U.S., REWE in Germany), we collected price information for products in the categories personal care and grocery. We then coded prices falling into the category of a just-below, precise, or round price. Please see the corresponding project on the Open Science Framework for detailed information on the web scraping process: <https://osf.io/cgke2>.

³A recent review of this literature established that the vast majority of prior studies were not preregistered and based on comparably small sample sizes (Troll et al., 2024). Consequently, publication bias analyses suggest the presence of small study effects (and possibly *p*-hacking) with corrected effect estimates of markedly smaller size and close to null. The authors conclude: “Given that different techniques suggested the presence of publication bias and that corrected effects were smaller and close to null, future pre-registered and high-powered research should examine the robustness of price-ending effects” (p. 321).

Framework (OSF; see <https://osf.io/4qfxu>, blinded for peer review). We preregistered the study's design, hypotheses, and the analysis plan (<https://osf.io/9f5dc>). We report all data exclusions, manipulations, and measures.

We applied a 3 (*price ending*: round vs. just-below vs. precise) $\times$ 6 (*product*: sofa, smoothie maker, bike lock, floor lamp, projector, backpack) mixed-design with repeated measures on the latter factor. Based on a sample size analysis in G*Power ($1-\beta = .90$; $\alpha = .05$; $f = 0.25$, assumed correlation between products of $r = .80$; Faul et al., 2007), we recruited 290 German students (67.2% women, 0.3% diverse; $M_{\text{age}} = 24.29$, $SD = 7.61$) at {Institution blinded for peer review} for course credit and a chance to win a 50€ online voucher. We excluded participants who exceeded $>|2.5| SD$ from the condition mean of purchase intention ($n = 2$), price image ($n = 1$), and quality image ($n = 4$).⁴ For the assumed effect of $f = 0.25$, the true power of the final $N = 284$ was $1-\beta = 98.91\%$.

Manipulations

We randomly assigned participants to a condition: round ($n = 96$), just-below ($n = 92$), and precise prices ($n = 96$). In the precise condition, half of the participants saw prices that were slightly lower (e.g., €28.83) vs. slightly higher (e.g., €31.17) than the round prices (e.g., €30.00). We followed prior research in collapsing across this over/under factor to rule out that outcome differences are driven by a difference in price magnitude between the precise and the round condition (see Tables S3, S7–S8; see also Janiszewski and Uy, 2008; Loschelder et al., 2017; Mason et al., 2013). The stimulus materials for all conditions are available on OSF (<https://osf.io/5twn4>).

Dependent measures

Participants imagined themselves seeking to buy six products in a randomly presented order (sofa, smoothie maker, bike lock, floor lamp, projector, backpack). For each product, we assessed all four key outcomes of the literature: (1) purchase intention, (2) price image (four items; $.70 < \alpha < .83$ ⁵; adapted from Schindler and Kibarian, 2001; Carver and Padgett, 2012), and (3) quality image (three items; $.79 < \alpha < .87$ ⁶; adapted from Schindler and Kibarian, 2001). All items were rated on 7-point scales (1 = *strongly disagree*; 7 = *strongly agree*; see OSF for full item list). After participants had completed (1)–(3), we assessed (4) correct (and underestimated) price recall by asking them to enter the price for all six products (Chan, 2022). We

operationalized price underestimation via price recall accuracy and underestimated recall, which capture a memory-based measure of underestimation (see Manning and Sprott, 2009); this differs from the direct comparison-based magnitude-perception paradigm used by Thomas and Morwitz (2005).

Results

Unless noted otherwise, analyses were preregistered (see OSF for preregistered analyses). For brevity, we only report the main effects of *price ending* from the 3 $\times$ 6 mixed ANOVA (see Table 2, detailed results in the SOM).

Effects of price endings

For price image, we found a significant price-ending effect, $F(2, 281) = 8.04$, $p < .001$, $\eta_p^2 = .054$. Contrast analyses showed that precise prices ($M = 3.70$, $SD = 0.77$) caused better price images than round ($M = 3.42$, $SD = 0.61$), $t(180.88) = 2.75$, $p = .007$, $d = 0.40$, and just-below prices ($M = 3.26$, $SD = 0.89$), $t(179.61) = 3.63$, $p < .001$, $d = 0.53$. The latter two did not differ, $t(160.44) = 1.49$, $p = .140$, $d = 0.22$. Similarly, a significant price-ending effect, $F(2, 281) = 714.83$, $p < .001$, $\eta_p^2 = .836$, showed that round prices ($M = 84\%$, $SD = 19\%$) were recalled more accurately than just-below ($M = 13\%$, $SD = 17\%$), $t(183.74) = 26.89$, $p < .001$, $d = 3.92$, and precise prices ($M = 4\%$, $SD = 10\%$), $t(145.92) = 35.31$, $p < .001$, $d = 5.10$. The latter two also differed, $t(152.15) = 4.26$, $p < .001$, $d = 0.63$. Also, a significant price-ending effect, $F(2, 281) = 150.88$, $p < .001$, $\eta_p^2 = .518$, showed that precise prices ($M = 65\%$, $SD = 24\%$) were more likely to be underestimated than just-below ($M = 44\%$, $SD = 25\%$), $t(185.40) = 5.93$, $p < .001$, $d = 0.87$, and round prices ($M = 11\%$, $SD = 15\%$), $t(155.92) = 18.61$, $p < .001$, $d = 2.69$. Again, the latter two also differed, $t(146.86) = 11.01$, $p < .001$, $d = 1.61$. Importantly, price endings did not affect purchase intentions or quality image, $F_s < 0.45$, $p_s > .640$, $\eta_p^2 < .003$ (Table 2).

Mediation analysis

We conducted exploratory multiple mediation analyses (Process Model 4; Hayes, 2013) to jointly illuminate how price image, quality image, and underestimated recall mediate the price-ending effects on purchase intentions (focusing on precise vs. round and just-below prices; see Figure 1). The indirect effect through price image was significant, $b = 0.18$, $SE = 0.05$, $CI_{95\%} [0.09, 0.29]$. The indirect effects through quality image, $b = 0.03$, $SE = 0.04$, $CI_{95\%} [-0.05, 0.11]$, and underestimated recall, $b = 0.06$, $SE = 0.07$, $CI_{95\%} [-0.07, 0.19]$, were not.

Interim discussion

In sum, Study 1 showed that precise prices produced the strongest underestimation in price recall (see level-effects theorizing) and the best price image (see image-effects and attribution-of-competence theorizing), thus supporting the price-image component of H2a

⁴This exclusion procedure was preregistered before data collection. Reassuringly, robustness analyses including the full sample corroborated the results of our analyses (see Tables S18–S19 in the SOM for the full comparison).

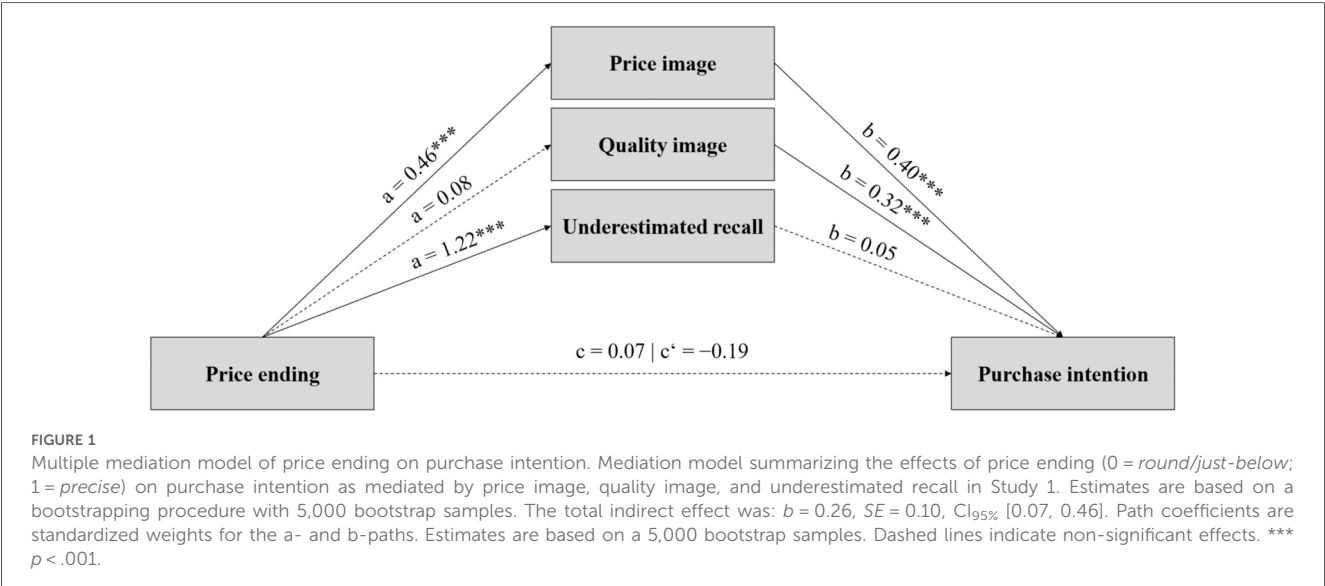
⁵We conducted exploratory factor analysis (EFA) with principle-axis factor extraction on the price image items of each product separately. These analyses consistently suggested one factorial solutions with eigenvalues > 2.14 that explained minimally 53.53% of the total variance and showed consistently high factor loadings ranging from .474 to .884.

⁶Again, EFAs on the quality image items of each product consistently suggested one factorial solutions with eigenvalues > 2.15 , uniformly high factor loadings ranging from .795 to .924, and explaining minimally 71.65% of the total variance.

TABLE 2 Means (standard deviations) and ANOVA effects on crucial consumer outcomes in study 1.

Outcome	Round	Just-below	Precise	<i>F</i> (2, 281)	η^2_p
Image effects					
Price image	3.42 (0.61) _a	3.26 (0.89) _a	3.70 (0.77) _b	8.04***	.054
Quality image	4.12 (0.57)	4.05 (0.77)	4.14 (0.68)	0.45	.003
Level effects					
Correct recall	84% (19%) _a	13% (17%) _b	4% (10%) _c	714.83***	.836
Underestimated recall	11% (15%) _a	44% (25%) _b	65% (24%) _c	150.88***	.518
Consumer demand					
Purchase intention	3.48 (0.84)	3.49 (1.02)	3.56 (0.98)	0.16	.001

Mean (standard deviation in parentheses) are based on the complete sample of $N = 284$ in Study 1. F -values for preregistered main effects of Price Ending are based on 3 (Price Ending) $\times$ 6 (Product) mixed ANOVAs with repeated measures on the latter factor. In case of a significant main effect, means with different subscripts (a, b, c) per row are significantly different from each other based on *post-hoc* contrast analyses (i.e., $t_s < 2.75$, $p_s < .007$). For all other analyses, see SOM.
*** $p < .001$.



(while contradicting H2b). Exploratory mediation analyses suggested that price image in turn emerged as an indirect pathway to participants' purchase intentions. Supporting our H1, just-below prices were also more underestimated than round prices, consistent with level-effects theorizing.

Study 2

The aim of Study 2 was twofold: To replicate Study 1 and to extend our findings by examining the impact of comparison prices (Choi and Coulter, 2012; Lowe and Alpert, 2010; Weisstein et al., 2013). These have repeatedly been found to be relevant for purchase decisions in advertising (Jaikumar, 2018), retail (Chen et al., 2024), or auctions (Liu and Popkowski Leszczyc, 2023). We expected price-ending effects to be particularly pronounced when target prices were juxtaposed with non-matching round comparison prices (see Troll et al., 2024).

Method

The design and procedure of Study 2 were similar to Study 1 with one exception: We added comparison prices as an exploratory factor with two levels (round vs. matching comparison prices): Each product was accompanied by four comparable products featuring round prices vs. prices that matched the respective price condition (i.e., just-below, precise, or round). In sum, a 3 (price ending: round vs. just-below vs. precise) $\times$ 2 (comparison price: round vs. matching) $\times$ 6 (product: armchair, pan, water boiler, vacuum cleaner, plates, mattress) mixed-design with repeated measures for the latter factor emerged. The preregistration document (<https://osf.io/8t3sy>) and stimulus material is available on OSF (<https://osf.io/sr7xz>). In total, we recruited 439 German students (66.5% women, 0.5% diverse; $M_{age} = 27.46$, $SD = 10.10$) who were randomly assigned to an experimental condition. As preregistered, we excluded participants $>|2.5| SD$ of their condition mean for purchase intention ($n = 5$), price image ($n = 3$), and quality image

($n = 14$).⁷ The final sample ($N = 417$) yielded a total power of $1 - \beta = 99.65\%$. We used the same measures as in Study 1 to assess purchase intention, price image ($.65 < \alpha < .72$), quality image⁸ ($.83 < \alpha < .87$), and price recall. By presenting explicit comparison prices alongside the target price, Study 2 moves conceptually closer to comparison-based paradigms of price perception, although our outcome measure for (underestimated) recall remains memory-based rather than a direct judgment of relative price magnitude.

Results

We report preregistered, confirmatory hypotheses for price-ending effects and explored *comparison price* as a moderator in 3 (Price Ending) $\times 6$ (Product) $\times 2$ (Comparison Price) mixed ANOVAs (see complete results and robustness analyses in the SOM). Because we did not preregister formal hypotheses for comparison-price moderation, these analyses are interpreted as exploratory.

Effects of price endings and comparison prices

In line with Study 1, no price-ending effects on *purchase intentions* emerged, $F(2, 411) = 0.10$, $p = .907$, $\eta_p^2 = .000$. A significant main effect for comparison price, however, $F(1, 411) = 13.34$, $p < .001$, $\eta_p^2 = .031$, showed higher purchase intentions when round comparison prices ($M = 3.42$, $SD = 0.92$) rather than matching comparison prices ($M = 3.07$, $SD = 1.05$) were included (interaction: $F[2, 411] = 0.21$, $p = .808$, $\eta_p^2 = .001$).

We replicated the price-ending main effect, $F(2, 411) = 12.14$, $p < .001$, $\eta_p^2 = .056$, in that precise prices ($M = 2.88$, $SD = 0.86$) evoked better *price images* than round ($M = 2.46$, $SD = 0.69$), $t(258.70) = 4.52$, $p < .001$, $d = 0.55$, and just-below prices ($M = 2.57$, $SD = 0.86$), $t(265.53) = 3.30$, $p = .001$, $d = 0.40$. The latter two again did not differ, $t(278.88) = 1.30$, $p = .196$, $d = 0.16$. In addition, a comparison-price main effect, $F(1, 411) = 22.25$, $p < .001$, $\eta_p^2 = .051$, showed more advantageous price images for round ($M = 2.81$, $SD = 0.79$) compared to matching comparison prices ($M = 2.47$, $SD = 0.73$). Both main effects were driven by a particularly positive price-image effect of precise prices that emerged for round comparison prices (interaction: $F[2, 411] = 3.00$, $p = .051$, $\eta_p^2 = .014$; Figure 2).

As in Study 1, price endings did not impact *quality image*, $F(2, 411) = 0.85$, $p = .428$, $\eta_p^2 = .004$. A significant comparison-price main effect, $F(1, 411) = 23.09$, $p < .001$, $\eta_p^2 = .053$, however, revealed higher quality images for round ($M = 4.52$, $SD = 0.68$) compared to matching comparison prices ($M = 4.19$, $SD = 0.72$; interaction: $F[2, 411] = 0.12$, $p = .887$, $\eta_p^2 = .000$).

Corroborating Study 1, a significant price-ending effect, $F(2, 411) = 286.57$, $p < .001$, $\eta_p^2 = .582$, showed that round prices ($M = 65\%$, $SD = 23\%$) were *recalled* more accurately than just-below ($M = 26\%$, $SD = 30\%$), $t(265.49) = 12.23$, $p < .001$, $d = 1.46$, and precise prices ($M = 1\%$, $SD = 4\%$), $t(147.01) = 31.85$, $p < .001$, $d = 3.84$. The latter two also differed, $t(148.32) = 9.68$, $p < .001$, $d = 1.15$ (all other F s < 1.98 , p s $> .139$).

A significant price-ending effect, $F(2, 411) = 133.19$, $p < .001$, $\eta_p^2 = .393$, showed that precise prices ($M = 60\%$, $SD = 23\%$) were, as in Study 1, more likely underestimated than just-below ($M = 38\%$, $SD = 27\%$), $t(273.30) = 7.35$, $p < .001$, $d = 0.88$, and round prices ($M = 15\%$, $SD = 17\%$), $t(252.55) = 18.33$, $p < .001$, $d = 2.22$. The latter two also differed, $t(244.00) = 8.54$, $p < .001$, $d = 1.02$ (all other F s < 1.45 , p s $> .236$).

Moderated mediation analysis

We conducted exploratory moderated mediation analyses (Process Model 8; Hayes, 2013; see Study 1) with comparison price as a potential moderator (see Figure 3). Corroborating Study 1, the indirect effects through quality image and underestimated recall were not significant. Also as in Study 1, the indirect effect through price image was significant, but only for round comparison prices, $IMM = -0.17$, $SE = 0.08$, $CI_{95\%} [-0.34, -0.03]$, which adds nuance to the only marginally significant omnibus interaction reported above. The conditional indirect effect was significantly stronger for round, $b = 0.26$, $SE = 0.07$, $CI_{95\%} [0.13, 0.40]$, than for matching comparison prices, $b = 0.08$, $SE = 0.05$, $CI_{95\%} [-0.01, 0.19]$.

Discussion

Despite widespread use in consumer markets (Ventura et al., 2025), research has shown inconsistent effects of just-below (\$9.99; Hung et al., 2021; Martínez-Ruiz et al., 2006) vs. round prices (\$10.00; Guéguen et al., 2009; Wieseke et al., 2016). A recent meta-analysis also established small-study effects and publication bias; corrected meta-analytical effects are much smaller and close to zero (Troll et al., 2024). Surprisingly, the literature is void of preregistered and high-powered price-ending experiments. In addition, the effects of precise prices (\$9.67) have received comparatively little direct attention in the pricing literature (Cui et al., 2021; Kim et al., 2020). To address these gaps, two experiments examined how all three price endings affect key outcomes—price image, purchase intention, quality image, and price recall. In contrast to previous research, our high-powered studies did not replicate the price-ending effects on quality image (e.g., Völckner and Hofmann, 2007; cf. Kurz et al., 2023) or on purchase intentions (e.g., Choi et al., 2014). The absence of direct effects on purchase intentions and quality image may reflect habituation to common pricing practices (Chen et al., 2024; Troll et al., 2024) or the possibility that price endings alone provide insufficient quality information to shape broader product evaluations (Pennesi, 2025). While price endings did not impact quality image and purchase intentions as strongly as was long thought (Gendall et al., 1997; Schindler and Kibarian, 2001; Völckner and Hofmann, 2007), they did impact price images in an interesting way.

⁷Reassuringly, robustness analyses including the full sample corroborated the results of our analyses and all decisions were the same with and without excluding outliers (see Tables S18–S19).

⁸Again, EFAs with principle-axis factor extraction consistently suggested one factorial solutions with eigenvalues > 2.04 (price image) and > 2.24 (quality image), medium to high factor loadings ranging from .329 to .904 (price image) and .815 to .922 (quality image), explaining minimally 50.97% (price) and 74.56% (quality image) of the total variance.

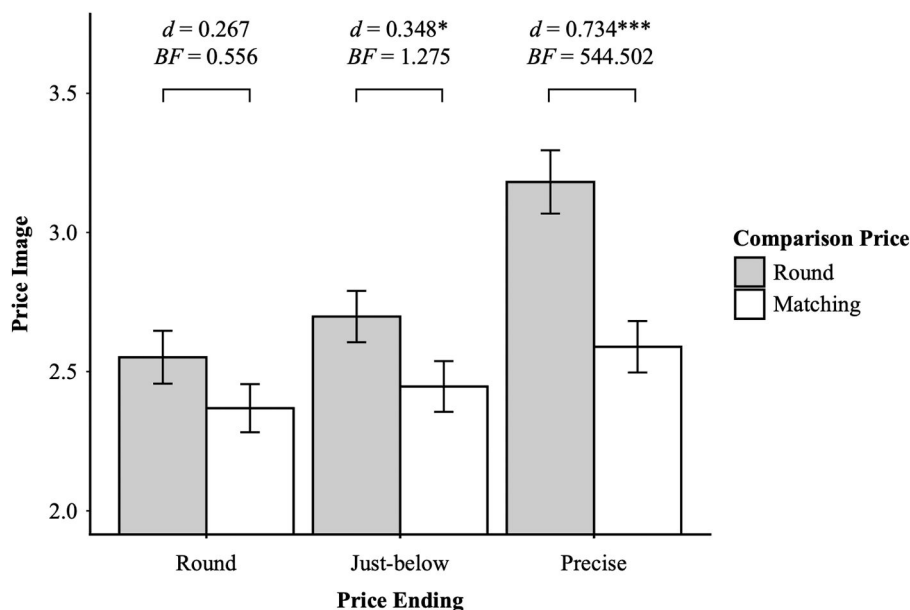


FIGURE 2

Price images as a function of price endings and comparison prices. Mean price image as a function of (1) round, just-below, and precise price endings, as well as (2) round (grey) and matching (white) comparison prices in Study 2. Contrast analyses showed significant effects of comparison price in just-below, $t(140.88) = 2.084$, $p = .039$, $d = 0.348$, and precise prices, $t(128.30) = 4.268$, $p < .001$, $d = 0.734$, but not for round prices where both conditions were equal (round target prices with round comparison prices), $t(135.96) = 1.569$, $p = .119$, $d = 0.267$. BF values indicate Bayesian evidence for the presence of an effect (common conventions suggest that a BF between 1 and 3 equals 'anecdotal' evidence, a $BF > 3$ equals 'moderate', a $BF > 10$ suggests 'strong', a $BF > 30$ equals 'very strong', and a $BF > 100$ suggests 'extreme' evidence; Lee and Wagenmakers, 2013). Error bars show 95% CI. * $p < .05$, *** $p < .001$.

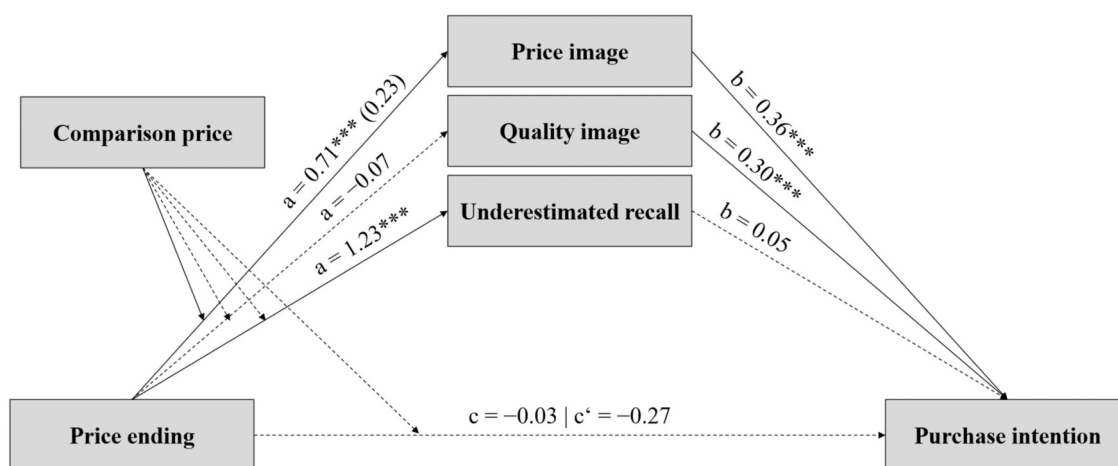


FIGURE 3

Moderated multiple mediation model of price ending on purchase intention. Moderated mediation model summarizing the effects of price ending (0 = precise/just-below, 1 = precise) on purchase intention as mediated by price image, quality image, and underestimated recall in Study 2. The total indirect effect was: $b = 0.21$, $SE = 0.08$, $CI_{95\%} [0.05, 0.37]$. Path coefficients are standardized weights for the a- and b-paths at value 0 of the moderator (i.e., round comparison prices); in case of a significant index of moderated mediation, standardized weights at value 1 of the moderator (i.e., matching comparison prices) are given in parentheses. Estimates are based on a 5,000 bootstrap samples. Dashed lines indicate non-significant effects. *** $p < .001$.

Precise prices resulted in the most advantageous price image. This suggests that previous benefits of just-below prices—assuming a true phenomenon and as hypothesized in our H1—are not (or at least not exclusively) due to classical image effects alone (Gonçalves et al., 2025). Other processes (e.g., attribution or expectation effects) come into play, particularly for precise

prices (e.g., Kurz et al., 2023; see also Frech et al., 2020). Consumers might infer more diagnostic value from a numerically precise price (Guo et al., 2025) and perceive it as particularly fair and accurate (Kalyanaram and Winer, 2022; Loschelder et al., 2014), thus increasing purchase intention (see H2a).

Our data expand the literature in three more ways: First, our results show that precise prices were indeed more often underestimated in price recall than just-below and round prices—that is, level effects were most pronounced in these prices (Chan, 2022; Manning and Sprott, 2009). Presumably, this is due to distinguishable cognitive processes, such as processing fluency (Reber et al., 2004; Wieseke et al., 2016). Second, our exploratory mediation analyses suggest that the more favorable price image, associated with precise prices, served as an indirect pathway to purchase intentions (Gonçalves et al., 2025). Third, and finally, our study offers preliminary experimental evidence that this mediation is moderated by comparison prices in the direct vicinity of the target price (Choi and Coulter, 2012; Lowe and Alpert, 2010). Juxtaposed to round prices, the image of precise prices was particularly positive, and comparison prices emerged as a significant moderator in the exploratory mediation analysis (Biswas et al., 2002). Note, however, that these findings are based on exploratory analyses and should be interpreted cautiously.

Avenues for future research and implications

The present study suggests avenues for future research. First, we acknowledge that—although our experimental material was closely adapted to today's real-world advertising experiences—we provide experimental evidence in imagined buying situations that should be replicated in field settings. The present studies also offer impetus for future investigation of the underlying processes: With the present data, it remains unclear whether the relative advantage of precise prices is due to basic cognitive and emotional processes (e.g., fluency; Wadhwa and Zhang, 2015) or more complex attribution effects known from decision-making and negotiations (e.g., Loschelder et al., 2016). For example, it may be theoretically worthwhile to compare different categories of precise price endings (e.g., \$33.97 vs. \$33.99). Future research is needed to investigate more thoroughly, and causally, the underlying psychological processes and potential moderators like decision context, price level, or consumer-level factors (Chen et al., 2024; Najafi-Ghobadi and Kalantary, 2026). Finally, although product effects and product $\times$ price-ending interactions were beyond the main scope of this brief report and are therefore reported only in the SOM, these analyses suggest that price-ending effects may differ across products. Future research could examine more systematically when and for which product categories round, just-below, and precise prices are most effective.

Our study suggests cautious implications for advertising and E-Commerce. First, it seems plausible that an overabundance of just-below prices may have weakened the price-image effects reported in earlier studies from past decades. More generally, past pricing effects should be interpreted cautiously, as they may have been overestimated in size (Troll et al., 2024) and may depend on the surrounding price context, such as the presence of other products and prices featured around them (Biswas et al., 2002; Thomas and Morwitz, 2005). Expanding the literature beyond just-below prices, our results suggest that

scarcely researched precise prices can shape consumer price perceptions and judgments—particularly when presented juxtaposed with round comparison prices (Study 2). At the same time, these implications should not be overstated: Our studies relied on student samples and imagined purchase situations rather than consequential field behavior. The present findings therefore point to potentially relevant consumer-level processes, but stronger managerial conclusions require replication in consequential and field-based market settings. Precise prices may be promising in some contexts, but they are unlikely to constitute a panacea, nor should they be applied indiscriminately. Rather, they should be tested in more naturalistic and field-based settings before stronger managerial conclusions are drawn.

Conclusion

The present research extends the literature by offering a more comprehensive understanding of three common pricing strategies and the perceptual and evaluative processes through which they shape consumer perceptions and subsequent behavior. Our findings identify psychological advantages of thus far understudied precise prices, in that they are frequently underestimated by consumers and generate a more favorable price image than both just-below and round prices. In doing so, we challenge the long-standing assumption that 9-ending prices are consistently the most effective (Study 1). Further expanding extant literature, exploratory mediation analyses suggest that price image serves as an indirect pathway through which precise price endings shape purchase evaluations, especially in the direct vicinity of round comparison prices (Study 2).

Data availability statement

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found below: <https://osf.io/4qfxu>.

Ethics statement

The requirement of ethical approval was waived by Ethical Research Commission of the School of Management and Technology at Leuphana University Lüneburg. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

YE: Conceptualization, Data curation, Formal analysis, Visualization, Writing – original draft, Writing – review & editing. ET: Conceptualization, Investigation, Writing – original draft. M-LH: Conceptualization, Investigation, Writing –

original draft. DL: Conceptualization, Investigation, Supervision, Writing – original draft.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that generative AI was not used in the creation of this manuscript.

References

- Allred, A., Valentin, E. K., and Chakraborty, G. (2010). Pricing risky services: preference and quality considerations. *J. Prod. Brand Manag.* 19 (1), 54–60. doi: 10.1108/10610421011018392
- Banerjee, P. J., Tripathi, S., and Sahay, A. (2016). When less is better than more: just-below discount in tensile price promotions. *J. Retail. Consum. Serv.* 31, 93–102. doi: 10.1016/j.jretconser.2016.03.012
- Baumgartner, B., and Steiner, W. J. (2007). Are consumers heterogeneous in their preferences for odd and even prices? Findings from a choice-based conjoint study. *Int. J. Res. Mark.* 24 (4), 312–323. doi: 10.1016/j.ijresmar.2007.05.003
- Beracha, E., and Seiler, M. J. (2014). The effect of listing price strategy on transaction selling prices. *J. Real Estate Fin. Econ.* 49 (2), 237–255. doi: 10.1007/s11146-013-9424-1
- Biswas, A., Pullig, C., Yagci, M. I., and Dean, D. H. (2002). Consumer evaluation of low price guarantees: the moderating role of reference price and store image. *J. Consum. Psychol.* 12 (2), 107–118. doi: 10.1207/s153276602760078640
- Bizer, G. Y., and Schindler, R. M. (2005). Direct evidence of ending-digit drop-off in price information processing. *Psychol. Mark.* 22 (10), 771–783. doi: 10.1002/mar.20084
- Bradley, A., and James, R. J. E. (2019). Web scraping using R. *Adv. Methods Pract. Psychol. Sci* 2 (3), 264–270. doi: 10.1177/2515245919859535
- Carver, J. R., and Padgett, D. T. (2012). Product category pricing and future price attractiveness: 99-ending pricing in a memory-based context. *J. Retail.* 88 (4), 497–511. doi: 10.1016/j.jretai.2012.05.001
- Chan, F. F. Y. (2022). Consumer recall and recognition of co-appearing brands in TV media: the moderating roles of product congruity and brand familiarity. *J. Advert. Res.* 62 (1), 18–34. doi: 10.2501/jar-2022-003
- Chen, M., Burke, R. R., Hui, S. K., and Leykin, A. (2024). Understanding shoppers' attention to price information at the point of consideration using in-store ambulatory eye-tracking. *J. Retail.* 100 (3), 439–455. doi: 10.1016/j.jretai.2024.06.003
- Choi, J., Li, Y. J., Rangan, P., Chatterjee, P., and Singh, S. N. (2014). The odd-ending price justification effect: the influence of price-endings on hedonic and utilitarian consumption. *J. Acad. Mark. Sci.* 42, 545–557. doi: 10.1007/s11747-014-0369-6
- Choi, P., and Coulter, K. S. (2012). It's not all relative: the effects of mental and physical positioning of comparative prices on absolute versus relative discount assessment. *J. Retail.* 88 (4), 512–527. doi: 10.1016/j.jretai.2012.04.001
- Cui, Y. G., Kim, S. S., and Kim, J. (2021). Impact of preciseness of price presentation on the magnitude of compromise and decoy effects. *J. Bus. Res.* 132, 641–652. doi: 10.1016/j.jbusres.2020.10.017
- Dogerlioglu-Demir, K., Akpinar, E., Gurhan-Canli, Z., and Koças, C. (2022). Are 1-endings the new 9-endings? An alternative for generating price discount perceptions. *J. Retail. Consum. Serv.* 66, 102912. doi: 10.1016/j.jretconser.2022.102912
- Faul, F., Erdfelder, E., Lang, A. G., and Buchner, A. (2007). G*power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav. Res. Methods* 39, 175–191. doi: 10.3758/BF03193146
- Frech, M.-L., Friese, M., and Loschelder, D. D. (2022). My goal is to lose 2.923 kg!™—efficacy of precise versus round goals for body weight reduction. *Front. Psychol.* 13, 793962. doi: 10.3389/fpsyg.2022.793962
- Frech, M.-L., Loschelder, D. D., and Friese, M. (2020). How attribution-of-competence and scale-granularity explain the anchor precision effect in negotiations and estimations. *Soc. Cogn.* 28 (1), 40–61. doi: 10.1521/soco.2020.38.1.40
- Gendall, P., Holdershaw, J., and Garland, R. (1997). The effect of odd pricing on demand. *Eur. J. Mark.* 31 (11–12), 799–813. doi: 10.1108/03090569710190541
- Gonçalves, M. G., Barbosa, B., Saura, J. R., and Mariani, M. (2025). Exploring the role of product attributes in 9-ending pricing strategies: a study on online retailing. *J. Bus. Res.* 192, 115285. doi: 10.1016/j.jbusres.2025.115285
- Guéguen, N., Jacob, C., Legohérel, P., and Ngobo, P. (2009). Nine-ending prices and consumer's behavior: a field study in a restaurant. *Int. J. Hosp. Manag.* 28 (1), 170–172. doi: 10.1016/j.ijhm.2008.03.009
- Guo, W., Tian, J., and Li, M. (2025). Reputation vs. Price: sequential recommendations based on cue diagnosticity theory. *J. Retail. Consum. Serv.* 83, 104157. doi: 10.1016/j.jretconser.2024.104157
- Hayes, A. F. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-based approach*. New York: Guilford Press.
- Hung, H.-H., Cheng, Y.-H., Chuang, S.-C., Yu, A. P.-I., and Lin, Y.-T. (2021). Consistent price endings increase consumers' perceptions of cheapness. *J. Retail. Consum. Serv.* 61, 102590. doi: 10.1016/j.jretconser.2021.102590
- Jaikumar, S. (2018). How do consumers choose sellers in e-marketplaces? The role of display price and sellers' review volume. *J. Advert. Res.* 58 (2), 232–241. doi: 10.2501/JAR-2018-028
- Janiszewski, C., and Uy, D. (2008). Precision of the anchor influences the amount of adjustment. *Psychol. Sci.* 19 (2), 121–127. doi: 10.1111/j.1467-9280.2008.02057.x
- Jha, S., Biswas, A., Guha, A., and Gauri, D. (2024). Can rounding up price discounts reduce sales? *J. Consum. Psychol.* 34, 343–350. doi: 10.1002/jcpy.1384
- Kalyanaram, G., and Winer, R. S. (2022). Behavioral response to price: data-based insights and future research for retailing. *J. Retail.* 98 (1), 46–70. doi: 10.1016/j.jretai.2022.02.009

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Supplementary material

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- Kim, J., Cui, Y. G., Choi, C., Lee, S. J., and Marshall, R. (2020). The influence of preciseness of price information on the travel option choice. *Tour. Manag.* 79, 104012. doi: 10.1016/j.tourman.2019.104012
- Krishnamoorthy, A., and Sainam, P. (2025). Pricing cues and retail competition. *J. Retail.* 101 (1), 55–67. doi: 10.1016/j.jretai.2024.12.002
- Kurz, J., Efendić, E., and Goukens, C. (2023). Pricey therefore good? Price affects expectations, but not quality perceptions and liking. *Psychol. Mark.* 40 (6), 1115–1129. doi: 10.1002/mar.21799
- Lee, M. D., and Wagenmakers, E.-J. (2013). *Bayesian Cognitive Modeling: A Practical Course*. Cambridge: Cambridge University Press. doi: 10.1017/CBO9781139087759
- Levy, D., Lee, D., Chen, H., Kauffman, R. J., and Bergen, M. (2011). Price points and price rigidity. *Rev. Econ. Stat.* 93 (4), 1417–1431. doi: 10.1162/REST_a_00178
- Levy, D., Snir, A., Gotler, A., and Chen, H. (2020). Not all price endings are created equal: price points and asymmetric price rigidity. *J. Monet. Econ.* 110, 33–49. doi: 10.1016/j.jmoneco.2019.01.005
- Liu, X., and Popkowski Leszczyc, P. T. L. (2023). The reference price effect of historical price lists in online auctions. *J. Retail. Consum. Serv.* 71, 103183. doi: 10.1016/j.jretconser.2022.103183
- Loschelder, D. D., Friese, M., Schaefer, M., and Galinsky, A. D. (2016). The too-much-precision effect: when and why precise anchors backfire with experts. *Psychol. Sci.* 27 (12), 1573–1587. doi: 10.1177/0956797616666074
- Loschelder, D. D., Friese, M., and Trötschel, R. (2017). How and why precise anchors distinctly affect anchor recipients and senders. *J. Exp. Soc. Psychol.* 70, 164–176. doi: 10.1016/j.jesp.2016.11.001
- Loschelder, D. D., Stuppi, J., and Trötschel, R. (2014). “€14,875!”: precision boosts the anchoring potency of first offers. *Soc. Psychol. Personal. Sci.* 5 (4), 491–499. doi: 10.1177/1948550613499942
- Lowe, B., and Alpert, F. (2010). Pricing strategy and the formation and evolution of reference price perceptions in new product categories. *Psychol. Mark.* 27 (9), 846–873. doi: 10.1002/mar.20361
- Madrigal, R., Soule, C. A. A., and King, J. (2025). Manipulating consumers with the truth: relative-difference claims in advertising and inferences of manipulative intent. *J. Advert.* 54 (1), 99–116. doi: 10.1080/00913367.2024.2306401
- Manning, K. C., and Sprott, D. E. (2009). Price endings, left-digit effects, and choice. *J. Consum. Res.* 36 (2), 328–335. doi: 10.1086/597215
- Martínez-Ruiz, M. P., Mollá-Descals, A., Gómez-Borja, M. A., and Rojo-Álvarez, J. L. (2006). Using daily store-level data to understand price promotion effects in a semiparametric regression model. *J. Retail. Consum. Serv.* 13 (3), 193–204. doi: 10.1016/j.jretconser.2005.08.017
- Mason, M. F., Lee, A. J., Wiley, E. A., and Ames, D. R. (2013). Precise offers are potent anchors: conciliatory counteroffers and attributions of knowledge in negotiations. *J. Exp. Soc. Psychol.* 49 (4), 759–763. doi: 10.1016/j.jesp.2013.02.012
- Najafi-Ghobadi, S., and Kalantary, M. R. (2026). Optimizing pricing in an online marketplace: the role of buy-now, pay-later option and return policies. *J. Retail. Consum. Serv.* 88, 104493. doi: 10.1016/j.jretconser.2025.104493
- Peev, P. P., and Mayer, J. M. (2017). Consumer perceptions of precise vs. Just-below prices in retail settings. *J. Promot. Manag.* 23 (5), 673–688. doi: 10.1080/10496491.2017.1297984
- Pena-Marin, J., and Yan, D. (2021). Reliance on numerical precision: compatibility between accuracy versus efficiency goals and numerical precision level influence attribute weighting in two-stage decisions. *J. Consum. Psychol.* 31 (1), 22–36. doi: 10.1002/jcpy.1178
- Pennesi, D. (2025). A behavioral model of consumer response to price information. *J. Econ. Behav. Organ.* 230, 106872. doi: 10.1016/j.jebo.2024.106872
- Reber, R., Schwarz, N., and Winkielman, P. (2004). Processing fluency and aesthetic pleasure: is beauty in the perceiver's processing experience? *Pers. Soc. Psychol. Rev.* 8 (4), 364–382. doi: 10.1207/s15327957pspr0804_3
- Schindler, R. M. (2006). The 99 price ending as a signal of a low-price appeal. *J. Retail.* 82 (1), 71–77. doi: 10.1016/j.jretai.2005.11.001
- Schindler, R. M., and Kibarian, T. M. (2001). Image communicated by the use of 99 endings in advertised prices. *J. Advert.* 30 (4), 95–99. doi: 10.1080/00913367.2001.10673654
- Schneider, G., Park, T., and Guha, A. (2025). Getting the most for a penny: how retailers can best use left-digit effects. *J. Retail.* 101 (2), 217–226. doi: 10.1016/j.jretai.2025.02.002
- Schultze, T., and Loschelder, D. D. (2021). How numeric advice precision affects advice taking. *J. Behav. Decis. Mak.* 34 (3), 303–310. doi: 10.1002/bdm.2211
- Sokolova, T., Seenivasan, S., and Thomas, M. (2020). The left-digit bias: when and why are consumers penny wise and pound foolish? *J. Mark. Res.* 57 (4), 771–788. doi: 10.1177/002243720932532
- Thomas, M., and Morwitz, V. (2005). Penny wise and pound foolish: the left-digit effect in price cognition. *J. Consum. Res.* 32 (1), 54–64. doi: 10.1086/429600
- Thomas, M., Simon, D. H., and Kadiyali, V. (2010). The price precision effect: evidence from laboratory and market data. *Mark. Sci.* 29 (1), 175–190. doi: 10.1287/mksc.1090.0512
- Troll, E. S., Frankenbach, J., Friese, M., and Loschelder, D. D. (2024). A meta-analysis on the effects of just-below versus round prices. *J. Consum. Psychol.* 34 (2), 299–325. doi: 10.1002/jcpy.1353
- Ventura, A., Troll, E. S., Soliman, M., and Loschelder, D. D. (2025). Round, just-below, or precise prices? Cultural differences in the prevalence of price endings in E-commerce. *Front. Behav. Econ.* 4, 1296207. doi: 10.3389/frmbe.2025.1296207
- Völckner, F., and Hofmann, J. (2007). The price-perceived quality relationship: a meta-analytic review and assessment of its determinants. *Mark. Lett.* 18, 181–196. doi: 10.1007/s11002-007-9013-2
- Wadhwa, M., and Zhang, K. (2015). This number just feels right: the impact of roundedness of price numbers on product evaluations. *J. Consum. Res.* 41 (5), 1172–1185. doi: 10.1086/678484
- Wang, X., Gu, Y., Xin, H., Qiu, P., and Wang, J. (2022). The role of product cues and regulatory focus in the consumers' response to green products: the mediation effects of green attitudes. *Front. Psychol.* 13, 918248. doi: 10.3389/fpsyg.2022.918248
- Weinstein, F. L., Monroe, K. B., and Kukar-Kinney, M. (2013). Effects of price framing on consumers' perceptions of online dynamic pricing practices. *J. Acad. Mark. Sci.* 41 (4), 501–514. doi: 10.1007/s11747-013-0325-6
- Wieseke, J., Kolberg, A., and Schons, L. M. (2016). Life could be so easy: the convenience effect of round price endings. *J. Acad. Mark. Sci.* 44 (4), 474–494. doi: 10.1007/s11747-015-0428-7
- Yan, D., and Pena-Marin, J. (2017). Round off the bargaining: the effects of offer roundness on willingness to accept. *J. Consum. Res.* 44 (2), 381–395. doi: 10.1093/jcr/ucx046