

The Dilution Effect of Bonus Packs: When Integrated Packaging Lowers Perceived Product Efficacy

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Abstract:

Bonus packs are widely used promotional tools, yet prior research largely frames them as providing a straightforward economic gain and overlooks how packaging format shapes consumer perceptions. This research examines how integrated versus separated bonus packs influence perceived product efficacy. Across multiple studies, we show that integrated (vs. separated) bonus packs reduce perceived product efficacy. This effect is driven by perceived ingredient dilution, the belief that increasing quantity implies reduced concentration. Importantly, this effect is moderated by zero-sum beliefs: the negative impact is mitigated among consumers and cultural groups with low zero-sum beliefs. Together, these findings uncover an overlooked downside of quantity-based promotions and offer guidelines for global marketers seeking to adapt packaging strategies across international markets.

Keywords: Bonus packs promotion, perceived ingredient dilution, product efficacy, zero-sum belief

Track: Consumer behaviour

1. Introduction

Bonus packs, promotions that offer increased product volume at the same price, are a prevalent quantity-based promotional tactic in global markets (Mishra & Mishra, 2011). By providing consumers with extra volume at no additional cost, bonus packs often generate stronger purchase responses than equivalent price discounts (Chen et al., 2012). In practice, bonus packs typically appear in two formats. Integrated bonus pack combine the original and extra volume into a single, enlarged container (Mishra & Mishra, 2011). In contrast, separated bonus pack provide the extra volume as a distinct unit attached to the original (d'Astous & Landreville, 2003), thereby preserving the integrity of the base product. Although these formats offer the same economic value, it remains unclear whether they are psychologically equivalent.

The literature generally treats all bonus packs uniformly, focusing on their economic appeal while overlooking how packaging format may influence consumers' influences. This gap is noteworthy because a growing body of work shows that external cues, such as packaging design (Ilyuk & Block, 2016), color saturation (Labrecque et al., 2025), and sensory signals (King et al., 2024), influence consumers' judgements of product efficacy. Building on this insight, we propose that bonus pack format itself can influence perceived product efficacy. We propose that integrated bonus packs may trigger perceptions of ingredient dilution, whereby consumers infer that a larger combined quantity signals reduced concentration or potency. Given consumers' strong preferences for purity, potency, and compositional integrity (Patrick et al., 2017) (Ton et al., 2024), such dilution inferences should lower perceived efficacy.

Across a series of controlled experiments, we show that integrated bonus packs lead to lower perceived product efficacy compared to separated bonus packs. We show that this negative effect is mediated by higher perceived ingredient dilution. Furthermore, we identify zero-sum beliefs as a key moderator: the negative impact of integrated packs occurs only among consumers with high zero-sum beliefs. For consumers with low zero-sum beliefs, the negative impact is attenuated. Because zero-sum beliefs and sensitivity to packaging cues vary systematically across cultures, these findings also highlight meaningful cross-cultural differences in consumer responses to bonus pack formats.

2. Hypothesis development

2.1 Bonus packs promotion type and perceived product efficacy

Consumers' perceptions of product efficacy are strongly influenced by how product quantity is presented, including package size (Yan et al., 2014) and unit configuration (Ilyuk & Block, 2016). Even when total volume is identical, single-serve versus multi-serve packaging can elicit distinct efficacy judgments (VanBergen et al., 2020)(Ilyuk & Block, 2016). Extending this logic to bonus packs, we propose that the format of the promotion (i.e., integrated versus separated) will differentially affect perceived product efficacy.

This proposition is grounded in the principle that consumers utilize external cues to infer unobservable internal attributes (Madzharov & Block, 2010; Raghurir & Krishna, 1999). Packaging, in particular, serves as a diagnostic cue for product composition and purity, with purity often defined by the concentration of essential ingredients relative to nonessential fillers (Ton et al., 2024). Consumers rely on these cues to evaluate internal quality, which subsequently shapes efficacy perceptions.

We argue that integrated bonus packs are especially prone to negative quality inferences. By combining the bonus volume with the original product, this format creates a larger, non-standard package. This alteration introduces ambiguity regarding the nature of the added volume, similar to a price discount (Zheng et al., 2022). According to the price-quality heuristic (Yan et al., 2014), consumers generally expect high price to signal higher quality. In integrated packs, price remains constant while visible volume increases, creating a potential mismatch. Consumers may resolve this discrepancy by inferring that the concentration of active ingredients per unit has decreased, leading to higher perceived ingredient dilution and lowering perceived efficacy.

In contrast, separated bonus packs maintain the original product's packaging and price frame, presenting the bonus as a distinct addition. Because the focal product remains unchanged, consumers do not perceive dilution, preserving its perceived efficacy.

H1: Integrated (vs. separated) bonus packs lead to lower perceived product efficacy.

H2: This negative effect is mediated by perceived ingredient dilution.

2.2 Zero-sum belief as a moderator

We further propose that the dilution-inference mechanism is contingent on consumers' zero-sum beliefs (ZSB), the belief that resources are fixed, such that gains in one area must be offset by losses in another (Roberts & Davidai, 2022). In the context of product evaluation, production resources are often viewed as constrained. Consequently, individuals with high ZSB interpret increases in product volume as necessarily reducing the allocation for key ingredients. This mindset amplifies the perceived ingredient dilution in integrated bonus packs, thereby intensifying the negative effect on perceived product efficacy.

In contrast, consumers with low ZSB do not view resource allocation as a fixed pie (Andrews-Fearon & Davidai, 2023). For these individuals, increased product volume does not imply a trade-off with ingredient quality. Consequently, the negative impact of integrated bonus packs on perceived ingredient dilution and perceived product efficacy is attenuated.

Importantly, ZSB is not uniform across cultural contexts. Prior research suggests that individuals in more competitive, scarcity-conscious, or resource-constrained cultures tend to hold stronger zero-sum beliefs, whereas those in more collaborative or abundance-oriented cultures exhibit weaker ZSB (Fiske et al., 2002; Gelfand et al., 2011). Accordingly, the negative effect of integrated bonus packs may be more pronounced in high ZSB cultures and attenuated in low ZSB cultures, highlighting important cross-cultural differences in consumer responses to bonus pack formats.

H3: Zero-sum beliefs moderate the indirect effect of bonus pack format on perceived product efficacy via perceived ingredient dilution. Specifically, this negative indirect effect is stronger for consumers with high (vs. low) zero-sum beliefs.

3. Study1: bonus pack type effect

3.1 Method

We recruited 240 participants from the Credamo platform (63.3%female; $M_{\text{age}} = 30.3$, $SD = 7.2$). This study was preregistered and employed a single-factor (bonus packs format: integrated vs. separated) between-subjects design. Participants were randomly assigned to one of the two experimental conditions. They were instructed to imagine purchasing a whitening serum featuring a “get more for the same price” bonus pack promotion. After

viewing the product, participants reported perceived product efficacy and perceived ingredient dilution using established multi-item scales (See Appendix).

RESULTS

Perception of product efficacy. A one-way ANOVA revealed that participants in the integrated bonus packs condition reported significantly lower perceived product efficacy ($M = 5.39$, $SD = 0.99$) than those in the separated bonus packs condition ($M = 5.64$, $SD = 0.70$; $F(1, 238) = 5.22$, $p = 0.023$, $\eta^2 = .022$).

Perceived ingredient dilution. A one-way ANOVA revealed that participants perceived significantly higher ingredient dilution in the integrated bonus packs condition ($M = 2.66$, $SD = 1.27$) than in the separated bonus packs condition ($M = 2.08$, $SD = 0.92$; $F(1, 238) = 16.31$, $p < 0.001$, $\eta^2 = .064$).

Mediation Analysis. We test the mediation using PROCESS Model 4 (Hayes 2013). Bonus packs format (integrated = 0, separated = 1) was entered as the independent variable, perceived product efficacy as the dependent variable, and perceived ingredient dilution as the mediator. The indirect effect was significant (indirect effect = 0.28, $SE = 0.08$, 95%CI [0.13, 0.46]), confirming the mediation. Specifically, integrated bonus packs (vs. separated) increased perceived ingredient dilution, which in turn reduced perception of product efficacy, supporting H1 and H2.

4. Study2: zero-sum belief

4.1 Method

We recruited 480 participants from Credamo (68.5%female; $M_{age} = 30.3$, $SD = 6.6$). Study 2 employed a single-factor (bonus packs promotion type: integrated vs. separated) between-subjects design and was preregistered. The procedure mirrored Study 1, with the addition of a zero-sum belief (ZSB) measure administered after the main dependent variables.

4.2 Results

Perception of product efficacy. We regressed perceived product efficacy on bonus packs promotion type (0 = integrated, 1 = separated), mean-centered ZSB, and their interaction. The main effect of bonus packs promotion type was not significant ($b = 0.10$, $SE = 0.08$, $p = .19$).

However, the analysis revealed a significant main effect of ZSB ($b = -0.43$, $SE = 0.04$, $p < .001$) and, consistent with our prediction, a significant interaction effect ($b = 0.19$, $SE = 0.05$, $t = 3.45$, $p < .001$, 95% CI = [0.08, 0.30]). We probed this interaction using spotlight analysis. At high levels of ZSB (+1 SD), the integrated (vs. separated) format resulted in significantly lower perceived efficacy ($b = 0.38$, $SE = 0.11$, $t = 3.37$, $p < .001$, 95% CI = [0.16, 0.60]). Conversely, at low levels of ZSB (-1 SD), the effect of bonus packs promotion type was not significant ($b = -0.17$, $SE = 0.11$, $p = .13$, 95% CI = [-0.39, 0.05]).

Perceived ingredient dilution. We conducted a similar analysis for perceived ingredient dilution. The results showed a significant main effect of bonus packs promotion type ($b = -0.33$, $SE = 0.09$, $p < .001$) and a significant main effect of ZSB ($b = 0.61$, $SE = 0.04$, $p < .001$). Importantly, the interaction effect was significant ($b = -0.21$, $SE = 0.06$, $t = -3.48$, $p < .001$, 95% CI = [-0.33, -0.09]). Simple slope analysis revealed that at high levels of ZSB (+1 SD), the integrated format led to significantly higher perceived dilution compared to the separated format ($b = -0.63$, $SE = 0.12$, $t = -5.20$, $p < .001$, 95% CI = [-0.87, -0.39]). However, at low levels of ZSB (-1 SD), this difference was not significant ($b = -0.04$, $SE = 0.12$, $t = -0.29$, $p = .77$, 95% CI = [-0.27, 0.20]).

Moderated mediation analyses. To test H3, we conducted a moderated mediation analysis (PROCESS Model 7; Hayes 2013). We entered bonus packs promotion type (0 = integrated, 1 = separated) as the independent variable, perceived ingredient dilution as the mediator, perceived product efficacy as the dependent variable, and ZSB as the moderator of the first stage. As predicted, the indirect effect of bonus packs promotion type on product efficacy via ingredient dilution was significant for participants with high ZSB ($b = 0.29$, $SE = 0.09$, 95% CI = [0.12, 0.49]). In contrast, this indirect effect was not significant for those with low ZSB ($b = 0.02$, $SE = 0.04$, 95% CI = [-0.07, 0.10]). Additionally, a floodlight analysis (Johnson-Neyman technique) indicated that the effect of bonus pack format was significant only for consumers with a ZSB score greater than 2.44 (measured on a 7-point scale).

5. Intended contributions

This research makes three key theoretical contributions. First, we extend the literature on quantity promotions by introducing a theoretically meaningful distinction between integrated

versus separated bonus pack formats. Moving beyond the prevailing view of bonus packs as simple economic gains, we show that the physical configuration of the promotion itself functions as a diagnostic cue that can undermine efficacy perceptions.

Second, we identify perceived ingredient dilution as the psychological mechanism underlying these effects. Building on work on the price-quality heuristic, we demonstrate that consumers use visible increases in volume to infer decreases in concentration, revealing a previously unrecognized backfire effect of quantity-based promotions. This contributes to research on packaging cues, quality inference, and consumer lay theories about product composition.

Third, we extend the application of ZSB in consumer behavior and highlight their cross-cultural relevance. Prior work shows that cultures vary systematically in beliefs about resource allocation, trade-offs, and the fixedness of the marketplace. By demonstrating that ZSB moderates dilution inferences, we identify a psychologically grounded mechanism that helps explain cross-cultural heterogeneity in responses to bonus pack promotions. Consumers and cultures that view resources as fixed are more prone to infer ingredient dilution from integrated packs, whereas those endorsing more expansive resource beliefs are not. This insight clarifies when global brands should expect bonus pack formats to backfire and underscores the importance of aligning promotional packaging strategies with cultural lay theories about resource trade-offs.

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APPENDIX A. Measurement in the studies

Variable	Item	CR
Perception of product efficacy (Labrecque et al., 2025)	PE1. How effective do you think this product is? PE2. How well do you think the product works? PE3. How good do you think this product is getting at the job done? (1 = "not all," and 7 = "very")	0.83
Perceived ingredient dilution (adapted from Ton et al.(2024))	ID1. I feel that the active ingredients in this product were diluted during the promotion. ID2. Compared to the brand's regular version of this product, I feel that the formula concentration of this product during the promotion is lower. (1 = "strongly disagree," and 7 = "strongly agree")	0.88
Zero-sum belief (Roberts & Davidai, 2022)	ZSB1. Product production costs are finite; if a company invests more in quantity, it must inevitably compromise on quality. ZSB2. For most consumer goods, product quantity and quality are inversely related. ZSB3. It is unrealistic to expect both increased quantity and high quality simultaneously. ZSB4. It is nearly impossible for a company to significantly increase product quantity while maintaining its original level of quality and efficacy.	0.93
Manipulation check	Participants rated the format of the quantity increase (1 = separate increase, 7 = combined increase).	-

APPENDIX B. Stimuli in the Study1 and Study 2

(a) Integrated bonus packs promotion



(b) Separated bonus packs promotion

