Product Entitativity: How the Presence of Product Replicates Increases Perceived and Actual Product Efficacy

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Many studies document the benefits of presenting smaller quantities of products, particularly when differences in quantity relate to availability or popularity. However, we know less about the effects of quantity differences in contexts unrelated to scarcity, such as when products are depicted in ads, special displays, or online retailing settings. The present research builds on extant literature by investigating a previously unexplored question: How do product perceptions differ depending on whether consumers view a single unit in isolation, versus as one unit among identical product replicates? Five experiments demonstrate that presenting multiple product replicates as a group (vs. presenting a single item) increases product efficacy perceptions because it leads consumers to perceive products as more homogeneous and unified around a shared goal. That is, consumers perceive greater product entitativity when viewing a group of product replicates. As a result, the perceived and actual ability of products to deliver that function (i.e., product efficacy) increases.

Keywords: entitativity, product quantity, perceived efficacy

Marketers feature products either in the presence or absence of product replicates in various contexts. As examples, online retailers depict offerings by showing a single unit or a group of replicates, advertisers present a single item or several identical items in their promotional materials, and in-store special displays and sampling booths feature one package or many packages of promoted products. Such variations apply to many fast-moving consumer goods such as foods, beverages, household cleaners, and pharmaceutical products, as well as to nonperishable products (e.g., special displays of small appliances in department stores). While extant research has studied variations in product quantity in many ways (Argo and White 2012; Castro, Morales, and Nowlis 2013; Haws and Winterich 2013; Ilyuk and Block 2016; Parker and Lehmann 2011; Scott et al. 2008; Sevilla and Townsend 2016; van Herpen, Pieters, and Zeelenberg 2009, 2014; Wansink 2004; Wansink and Chandon 2014; Wansink and Kim 2005; Yan, Sengupta, and Wyer 2014), we know little about how presenting a product among product replicates, as opposed to presenting a single product in isolation, affects product perceptions and experiences. Given that marketers promote, display, and package their products in various ways, such that product replicates may or may not be visible to consumers, research on the effects of displaying a product among product replicates versus in isolation is important to both marketers and consumers.

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Prior work in packaging and shelf-based scarcity suggests that product evaluations are more favorable when less (vs. more) quantity is featured (Castro et al. 2013; Ilyuk and Block 2016; Parker and Lehmann 2011; van Herpen et al. 2009; Yan et al. 2014). In the present research, we build on this literature by investigating the conditions under which a larger (vs. smaller) number of products may positively influence consumers' perceptions of product efficacy and product experiences. Specifically, we show that presenting multiple replicates of a product (vs. a single unit of a product) leads consumers to perceive each unit of the product as more effective and to derive greater efficacy from product consumption. In doing so, we contribute to prior research in several important ways. First, in contrast to prior work on the effect of packaging and shelf-based scarcity showing that less (vs. more) quantity leads to greater perceptions of product efficacy (Ilyuk and Block 2016; Wright et al. 2013) and product quality (Castro et al. 2013; Yan et al. 2014), we show that one unit of a product is perceived as more efficacious when it is presented as part of a group of identical products as opposed to being presented as an individual item.

Second, we draw from research on entitativity (Campbell 1958; Dasgupta, Banaji, and Abelson 1999; Hamilton and Sherman 1996; Smith, Faro, and Burson 2013) and group perception (Mishra 2009; Yzerbyt, Judd, and Corneille 2004) to show that presenting a group of product replicates increases perceived product efficacy because it influences perceptions of product entitativity. Our studies demonstrate that viewing multiple identical products leads consumers to see each product as a member of a homogeneous group unified by the products' shared benefit, increasing perceived product entitativity. As a result, perceived product efficacy—the ability of products to deliver their benefit—increases when a product is presented as part of a group of identical product replicates (vs. as an individual unit). Our research therefore makes a substantial contribution to extant research on entitativity and group perceptions through a dedicated examination of product entitativity (Gürhan-Canli 2003; Mishra 2009), documenting how this construct is affected by the presence or absence of product replicates. We show that a group of multiple identical products is perceived to be higher in entitativity than a single item; to our knowledge, this is the first demonstration of a context in which individual entities are generally perceived to be less entitative than groups. We further contribute to the entitativity literature by demonstrating that perceptions of entitativity can extend to groups of inanimate objects, and that greater product entitativity perceptions result in higher perceived product efficacy.

Finally, as we do not specifically focus on package size or shelf facings—but instead on the number of product replicates consumers are exposed to in advertisements, varied retail and product display settings, and at the time of consumption—the marketing implications of the quantity effects we investigate in this research extend from packaging to online retailing and advertising strategy. Thus, our findings carry important implications to marketers, retailers, advertisers, and consumers.

CONCEPTUAL DEVELOPMENT

Product Quantity and the Presence of Product Replicates

In the marketplace, product quantity varies in different ways. Packages come in different sizes (Yan et al. 2014; Zlatevska, Dubelaar, and Holden 2014), products are sold in packages containing different numbers of units (Ilyuk and Block 2016), and the number of products available on a shelf varies (Castro et al. 2013; Parker and Lehmann 2011; van Herpen et al. 2009). In addition, the visible number of product replicates presented in ads, in special displays, and on retailing websites varies. It is in these latter contexts, when consumers view and form impressions about products, that we are particularly interested. Although we are aware of no research examining how simply presenting more (vs. fewer) products in these latter domains affects product perceptions, research on shelf-based scarcity and packaging is relevant to our work. In particular, this literature shows that small quantities of products typically lead to more favorable consumer perceptions and experiences (e.g., in terms of product quality and effectiveness) than large quantities (Ilyuk and Block 2016; Parker and Lehmann 2011; van Herpen et al. 2009).

Two reasons for why low quantity tends to improve evaluations are related to our question of how product perceptions may differ depending on the presence or absence of product replicates. The first relates to perceptions of availability and the inferences people form about product popularity and quality as a result of perceived availability. Research on shelf-based scarcity shows that consumers infer that products in limited supply have been purchased by other consumers; thus, the products are perceived as more popular and higher in quality than items on fully stocked shelves, leading to greater purchase likelihood and choice of the scarce option (Castro et al. 2013; Parker and Lehmann 2011; van Herpen et al. 2009, 2014).

A second reason for the superiority of low quantity relates to consumers' reliance on proportional (vs. absolute) information (Slovic et al. 2002). Recent work has applied this reliance to product packaging, showing that the number of servings inside a package (i.e., single-serving vs. multiserving package formats) impacts how consumers perceive efficacious products such as energy enhancers and pain relievers (Ilyuk and Block 2016). Ilyuk and Block (2016) showed that, when consumers' processing resources are constrained, finishing the entire contents of a single-serving package (vs. consuming the same quantity as a

proportion of a multiserving package) leads individuals to perceive the consumed functional resources as more adequate, resulting in greater product efficacy. Consistent with the heuristic nature of proportion dominance, packaging format does not affect product efficacy when consumers' processing resources are unencumbered (Silvera, Josephs, and Giesler 2001).

Our research differs from the work described above in two important ways. First, we are interested in the impact of the presence of product replicates when variation in product quantity does not provide meaningful information about a product's availability, popularity, or quality. Specifically, rather than studying the role of product quantity in the traditional retail domain (in which case variance in quantity does signal availability and popularity), we examine how the presence of product replicates impacts perceptions in contexts such as advertising, online retailing, and promotional displays. In addition, as proportion-based effects of product quantity are more likely when the context makes the completion (or lack thereof) of a consumption episode salient (Ilyuk and Block 2016), the contexts in which we primarily focus our examination make the proportion heuristic less likely to impact product perceptions.

Second, previous research on shelf-based scarcity tends to examine the differences between perceptions of a product when many versus few products are available (Parker and Lehmann 2011; van Herpen et al. 2009, 2014; for an exception, see Castro et al. 2013). In contrast, we are interested in how consumers' product perceptions differ when products are presented as multiple product replicates versus as a single product. This difference is important because groups of multiple replicates have perceptual characteristics that single items are less likely to possess (discussed below), even if only a few replicates form the group. Furthermore, focusing our research on the presentation of single items versus multiple product replicates has substantial managerial relevance, as both presentation formats are ubiquitous in the contexts of interest.

As we argue below, considering the differences between a display featuring multiple identical products and a display featuring a single unit of the same product highlights distinctions that resonate with psychological research on group entitativity (Campbell 1958; Hamilton and Sherman 1996). We next review this literature to derive and support our hypotheses.

Entitativity

Typically applied to the context of social groups, *entitativity* refers to the extent to which a collection of individuals is perceived as a single, coherent entity (Campbell 1958; Hamilton and Sherman 1996; Yzerbyt, Corneille, and Estrada 2001). The study of entitativity thus deals with the question of what factors influence the extent to which a group can be seen as a unified singular entity. Research aimed at answering this question has demonstrated that certain characteristics increase perceptions of entitativity by signaling the "realness" of groups (Callahan and Ledgerwood 2016; Campbell 1958). Groups in which members are similar, share common goals, and have existed for a long time are perceived to be higher in entitativity than groups in which members are different from one another, pursue individual goals, and exist temporarily (Lickel et al. 2000). An example of a highly entitative group is an athletic team, as the team itself can be seen as a meaningful entity that is characterized by a stable quality shared by each team member (e.g., athletic skill). On the other hand, an example of low entitativity is a group of strangers waiting at a bus stop; in this case, there is not a meaningful quality that defines this aggregation of individuals, and observers are thus less likely to see "one group" and more likely to see "several people." While a few scholars have applied the concept of entitativity to contexts involving nonhuman stimuli (Gürhan-Canli 2003; Mishra 2009), as these examples suggest, entitativity has primarily been studied by social psychologists in the context of group perception.[1]

One conclusion from this research is that entitativity increases when the components that compose a whole (e.g., the members of a group) are perceived as more similar and coherent (Dasgupta et al. 1999; Lickel et al. 2000; Rogier and Yzerbyt 1999). As examples, students from the same university are perceived to be more entitative than students from different universities (Yzerbyt, Rogier, and Fiske 1998), and individuals with the same skin color are perceived as more entitative than individuals with different skin colors (Dasgupta et al. 1999). Observers assume that such surface-level similarities are indicative of deeper, more meaningful similarities, leading to the belief that entitative groups are defined by a singular core essence (Hamilton and Sherman 1996; Rydell and McConnell 2005; Yzerbyt et al. 2001).

Notably, both perceptual and conceptual bases of similarity are important for perceptions of entitativity. For example, a group of perceptually dissimilar people is perceived to be greater in entitativity if the people constituting the group are on the same athletic team, or if they go to the same school (Lickel et al. 2000; Yzerbyt et al. 1998). Similarly, while group size may positively correlate with perceptions of entitativity (McGarty et al. 1995), a group with as few as two people can also be perceived as highly

1 It is important to note that entitativity research has also investigated the perceived entitativity of a single person. This research typically finds greater perceptions of entitativity for a single person than a group of people (Hamilton and Sherman 1996; Kashima et al. 2005; McConnell et al. 1997). We build on this literature by proposing that this relationship reverses in the context of products, because, as we subsequently discuss, a group of product replicates better highlights the unity and functional similarity of products than a single unit. See also the General Discussion for more on this distinction.

entitative if they share a common goal or characteristic that makes their unity evident (e.g., when two people are described as romantic partners or as coworkers; Lickel et al. 2000). More broadly, groups characterized by the pursuit of a shared objective (i.e., "task groups") are consistently rated as highly entitative (Lickel et al. 2000).

As the literature above illustrates, a group is perceived to be more entitative when group members are perceptually homogeneous and/or are characterized by a meaningful basis of unity, such as the pursuit of a shared goal (Callahan and Ledgerwood 2016; Campbell 1958; Hamilton and Sherman 1996). We draw from these two defining aspects of entitativity to propose that perceiving multiple product replicates as a group increases perceived product entitativity.

First, because product replicates can be truly identical, a group of multiple replicates is highly homogeneous. While a single product in isolation may not necessarily be perceived as "low" in homogeneity, we propose that the presentation of multiple identical replicates highlights their homogeneity. This is consistent with research on perception that shows that people naturally see multiple identical items as a unified coherent figure due to their homogeneity (Palmer 1982; Redden and Hoch 2009; Wertheimer 1938).

Second, product replicates not only look identical, but also are likely to be perceived as unified around the same goal because they provide the same benefits. On the other hand, a single product in isolation is less likely to convey unity around a goal or benefit. Thus, just as pursuing a common goal increases the entitativity of people (Lickel et al. 2000), the functional unity of product replicates providing the same benefit should increase the entitativity of products. Therefore, we predict the presence of product replicates to enhance perceived product entitativity.

Further, we propose that entitativity perceptions lead to important downstream consequences regarding perceptions of product outcomes (i.e., perceived product efficacy). In particular, past research demonstrates that greater entitativity increases perceptions of group competence (Clark and Wegener 2009). This work shows that the unity and cohesiveness characterizing members of a high-entitativity group invite confidence in the group's abilities and increase the perceived likelihood that the group will successfully accomplish its goals (Clark and Thiem 2015; Clark and Wegener 2009). Consistent with these findings, Callahan and Ledgerwood (2016) showed that group identity symbols (e.g., flags, logos) increase entitativity by making groups seem more unified and real; as a result, members of groups with (vs. without) such symbols are perceived to be better able to act on their intentions. Importantly, increasing the entitativity of a group does not simply increase confidence in the actions taken by the collective group, but increases perceptions of the skills and abilities of each of its members (Callahan and Ledgerwood 2016, study 4; see also Crawford, Sherman, and Hamilton 2002; Hamilton, Sherman, and Castelli 2002).

Building on these findings, we propose that greater perceived product entitativity results in heightened perceptions of product efficacy. That is, given our prediction that the presence (vs. absence) of multiple replicates increases perceptions of products as a coherent entity characterized by the provision of a unifying benefit, it follows that each instance of this entity will be perceived as more capable of delivering the products' essential benefit. Thus, just as members of more cohesive and unified groups are perceived to be more competent at reaching the common goal that the group members pursue (Callahan and Ledgerwood 2016), products perceived to be more similar and unified by their shared benefit should be perceived as more effective at delivering the benefit they each aim to provide. As a result, we predict that a unit of a product presented within a group of multiple product replicates will be perceived as more effective than if presented as a single unit in isolation.

We test our predictions in five studies using a range of products and dependent measures. First, in study 1, we show that an advertisement displaying multiple product replicates (vs. a single unit) of a household cleaner leads to greater perceived efficacy. Study 2 conceptually replicates these results in an e-commerce context while also showing mediation by product entitativity and extending the effect to situations in which the group contains only two units of the product. In study 3, we demonstrate that when active ingredients of a product are perceived to be unified around a core benefit (thus increasing product entitativity), consumers perceive higher efficacy regardless of the presence or absence of product replicates. Study 4 builds on these results through an examination of boundary conditions. We find that the effect of displayed quantity generalizes to products that derive their efficacy from mechanical, rather than chemical, means, such that displaying multiple identical units of a durable good still results in greater perceived efficacy than a single unit. However, we find that the effect of displayed quantity is specific to efficacy judgments; perceptions of product attributes less related to the product's main benefit (e.g., user friendliness) are not affected by the presence of product replicates. Finally, in study 5, we show that these effects on perceived product efficacy translate to actual product efficacy experiences, consistent with research demonstrating the effect of efficacy expectations on actual product efficacy (Shiv, Carmon, and Ariely 2005). In addition, we show that individual differences in holistic processing (Choi, Koo, and Choi 2007) moderate the effect, as holistic processing relates to the tendency to conceptualize individual objects as unified wholes (Monga and John 2007, 2010; Zhu and Meyers-Levy 2009).

In each study, efforts were taken to ensure that all participants read instructions, paid attention to the stimuli, and provided meaningful responses to questions. To screen for

attention, attention checks were used in each study according to guidelines described by Meyvis and Van Osselaer (2017) and Oppenheimer et al. (2009). The proportion of participants excluded on the basis of failing attention checks is provided in each study's procedure. Sample sizes were determined *a priori* based on a minimum of 50 participants per cell, subject to participant availability.

STUDY 1

Study 1 aims to provide initial evidence for the effect of presenting a single product versus multiple product replicates (a factor we refer to as "displayed quantity" throughout our studies) on perceived efficacy. We presented participants with an advertising evaluation task involving a cleaning product that was represented by either a single unit of the product or five side-by-side product replicates and asked how effective the product was perceived to be. We hypothesized that the product would be perceived as more efficacious when represented by multiple product replicates (vs. a single product).[2]

Method

Participants and Design. Eighty-seven individuals (M_{age} = 34.7 years; 36.8% female) recruited from Amazon Mechanical Turk (MTurk) participated in study 1. This was the final sample after we excluded 17 participants (16.3%) due to a failed attention check. The design was a single-factor (displayed quantity: single vs. multiple) between-subjects design.

Procedure. We informed participants that the purpose of the study was to investigate responses to print advertisements. We showed participants an ad we created for "Dettol Surface Cleanser" that included minimal text ("Dettol Surface Cleanser—the smarter anti-bacterial solution" and "Look for it in a store near you!") along with a picture of the product(s). To manipulate displayed quantity, this ad depicted either a single bottle of Dettol or a group of five identical bottles of Dettol (see appendix). After viewing the ad, participants reported the perceived efficacy of Dettol, measured by four items: "In general, how effective do you think the Dettol you considered would be?" (1 = Not at all effective; 9 = Extremely effective); "How much do you think Dettol would help you clean your home?" (1 = Not at all; 9 = A great deal); "How effective do you think Dettol is in cleaning dirt and bacteria?" (1 = Not at all; 9 = Extremely); and "How potent do you think the active ingredients in Dettol are?" (1 = Not at all potent; 9 = Extremely potent). The average of these four items constitutes our dependent measure (α = .93).

Next, we administered questions to rule out alternative explanations.[3] In particular, it may be that participants make inferences about the size of the company or the popularity of the product based on the quantity of products in the ad. Therefore, we asked participants how much Dettol they thought the manufacturer produces (1 = Extremely low quantity; 9 = Extremely high quantity), how widely available they perceived the product to be (1 = Not at all; 9 = Extremely), and how popular they perceived the product to be (1 = Not at all; 9 = Extremely). We also asked how realistic the advertisement seemed (1 = Not at all; 9 = Extremely). Finally, we collected demographic measures, debriefed participants, and thanked them for their time.

Results

Perceived Efficacy. An independent samples *t*-test on the efficacy composite revealed that participants believed Dettol would be significantly more effective when the ad featured multiple products (M = 7.02, SD = 1.55) than when it presented a single unit (M = 6.36, SD = 1.50; $t(85) = 2.00$, $p = .048$; $\eta^2 = .045$).

Alternative Explanations. Results did not support alternative explanations. No significant effects of displayed quantity were found on perceptions of how much Dettol the manufacturer produces ($p = .11$), how widely available the product was perceived to be ($p = .23$), how popular the product was perceived to be ($p = .23$), or how realistic the ad seemed ($p = .28$).

Discussion

Study 1 provides initial evidence for our hypothesis that presenting a product among multiple product replicates (vs. in isolation) increases the perceived efficacy of the product. This finding carries important practical implications, as marketers can easily (and affordably) design ads that include multiple product replicates to increase perceptions of product efficacy. Moreover, we report the results of a conceptual replication of study 1 in the web appendix (study 1B), in which we replicate the effect of displayed quantity using a different product category (energy enhancers) and a different presentation context (a special display). In addition, the pretest for study 1 provides initial supportive evidence for the role of entitativity perceptions

2 Note also that a pretest (reported in the web appendix) featuring the same stimuli used in study 1 verified that the ad with multiple replicates resulted in greater perceived product entitativity than the ad with a single unit.

3 We rule out several alternative explanations across our studies, some of which are ruled out in multiple studies (please also see the supplemental studies reported in the web appendix). For space considerations, we do not repeat the ruling out of redundant alternative explanations in the study results unless they are addressed with new items. Details on all alternative explanations tested in each study are available in the web appendix.

underlying these effects, and a separate pretest for study 1B reported in the web appendix offers additional support for the role of entitativity. In the meantime, several alternative explanations failed to receive support across these studies.

STUDY 2

Study 2 expands on our prior studies in two primary ways. First, given that e-commerce contexts offer practitioners an easy opportunity to leverage the effects of displayed quantity, study 2 generalizes our examination of displayed quantity to an online retailing context. Second, in addition to conditions featuring a single unit of a product and several identical units of a product, study 2 includes a condition featuring *two* product replicates. While our theory does not speak directly to the distinction between specific quantities of products—only the distinction between "single" products and "multiple identical" products—this condition is included to explore the boundaries characterizing our effects and extend the practical implications. On one hand, perceptions of homogeneity and unity may be more likely with more (vs. fewer) units, such that two replicates are not sufficient to increase entitativity perceptions compared to a single item. On the other hand, given that entitativity perceptions of social groups can apply to two people (Lickel et al. 2000), and our theory is based on perceptions of homogeneity and unity in relation to products' primary benefits, displaying two units that share the same primary benefit may result in greater product efficacy perceptions than a single unit. Study 2 therefore provides a direct empirical test of these possibilities. Study 2 also measures both efficacy and entitativity in the same procedure, aiming to show that entitativity perceptions mediate perceived efficacy.

Method

Participants and Design. Three hundred seventy-one undergraduate business students (M_{age} = 20.3 years, 55.8% female) took part in study 2 for partial completion of a course requirement. This was the final sample after we removed 74 participants (16.6%) who did not pass the attention check. The design of study 2 was a single-factor between-subject design with three conditions: single unit vs. two units vs. 15 units.

Procedure. We asked participants to imagine they were doing some online shopping, and the website they were visiting featured an all-natural energy shot called EBOOST. Below the description of the scenario, we presented a listing for EBOOST that was designed to appear similar to online retailing websites such as Amazon. The listing showed a picture of the product, along with its name ("EBOOST Natural Energy Shot") and a short description of product features ("Made with coconut water, green tea, B-vitamins…"). We manipulated displayed quantity through the number of units that were pictured: one vs. two vs. 15 (in three rows of five units; see appendix).

After viewing the listing, participants responded to three questions measuring the perceived efficacy of EBOOST: "How effective do you think EBOOST is at increasing one's energy?" (1 = Not at all effective; 9 = Extremely effective); "How energetic do you think you would feel from drinking a bottle of EBOOST?" (1 = Not at all energetic; 9 = Very energetic); and "Imagine you have a lot of studying to do and drink a bottle of EBOOST. How much energy do you think EBOOST would give you as you studied?" (1 = Not much energy; 9 = A lot of energy). Responses to these questions were highly correlated, and the average of the three is used as our dependent measure ($\alpha = .93$).

On the following page, participants responded to the entitativity measure. Given that entitativity measures typically apply to groups of people, we developed a set of items suitable for perceptions of products. Our measure was designed to be consistent with the primary dimensions of entitativity established in the social psychology literature (i.e., perceptions of homogeneity and unity), while also applying equally well to both the multiple- and single-unit conditions. The result was a set of five statements measured on nine-point scales anchored at "strongly disagree" and "strongly agree." Sample items include "Each bottle of EBOOST seems to be unified around the same goal," and "It's easy to imagine bottles of EBOOST working together towards one goal." These are the same items used in the pretests, modified to reflect the product used in each study (see the web appendix for the complete list of items from each study). Responses to these items were highly correlated, and the average of the five constitutes our measure of entitativity ($\alpha = .90$). Participants then provided demographic information before being debriefed and thanked for their time.

Results

Perceived Efficacy. A one-way ANOVA on the average of the three items measuring perceived efficacy of EBOOST revealed a significant omnibus effect of displayed quantity ($F(2, 368) = 3.35$, $p = .036$; $\eta^2 = .018$). Replicating our prior results, when the listing featured 15 identical units of the product, participants perceived greater efficacy ($M = 5.56$, SD = 1.63) than when a single unit was displayed ($M = 5.04$, SD = 1.79; $F(1, 368) = 5.90$, $p = .016$). Moreover, results showed that two units of the product led to significantly higher perceptions of efficacy than the single unit ($M = 5.46$, SD = 1.57; $F(1, 368) = 3.98$, $p = .047$); perceptions of efficacy did not differ between the two-unit and 15-unit conditions ($p > .60$).

Entitativity. A similar one-way ANOVA on perceived entitativity also revealed a significant omnibus effect of displayed quantity ($F(2, 368) = 3.73$, $p = .025$; $\eta^2 = .020$). Replicating the pretest results, displaying 15 units led to significantly higher entitativity perceptions ($M = 7.70$, SD = 1.35) than displaying a single unit ($M = 7.20$, SD = 1.52; $F(1, 368) = 7.42$, $p = .007$). The two-unit condition resulted in entitativity perceptions between those of the single-unit and multiple-unit conditions ($M = 7.41$, SD = 1.40); this mean did not significantly differ from either of the other conditions ($ps > .11$).

Mediation. We tested for mediation of perceived efficacy by entitativity perceptions using Model 4 in Hayes's (2013) PROCESS macro for SPSS. In support of our theory, results showed that the indirect effect for the pairwise comparison between the single-unit condition and the 15-unit condition did not cross zero ($b = .19$, SE = .08, 95% CI [.054, .359]), while the direct effect for this comparison was attenuated to nonsignificance ($p = .11$). Entitativity perceptions also significantly predicted perceived efficacy ($b = .37$, SE = .06, $t(367) = 6.50$, $p < .0001$). The indirect effect for the comparison between the single-unit and two-unit condition did not reach significance ($b = .08$, SE = .07, 95% CI [−.048, .234]), although the direct effect for this comparison was weakened ($p = .09$).

Discussion

Study 2 contributes to our findings in two important ways. First, we generalize the context in which product evaluations are being made to an e-commerce setting, offering evidence for the practical implications of displayed quantity (particularly given that sellers on websites such as Amazon already differ according to whether they depict offerings as a single unit or multiple units—even when a multipack is being sold; see the web appendix for examples). Second, by including a condition featuring two product replicates, we provide both support for our conceptualization and additional practical insights. Our theory is based on the extent to which consumers perceive products to be unified around a single core function or benefit, which increases when multiple product replicates appear as a group. Our results suggest that presenting a second product alongside the first may be enough to signal this important, unifying benefit. That said, given that some pairwise comparisons did not reach significance, we interpret these results with caution: entitativity may be more likely to increase when many (as opposed to few) identical units are presented as a group. Nevertheless, the overall pattern of results is consistent with our conceptualization, and we continue to measure entitativity perceptions and test for mediation in our subsequent studies.

We also note that an apparent potential limitation of our entitativity measure is the inherent reference to quantity when the concept of unity is introduced (e.g., "each bottle seems to be unified around the same goal"). Readers might wonder whether participants in the single-unit (vs. multiple-unit) condition report lower entitativity perceptions partly because they were shown a single unit of the product, while the entitativity measure seems to suggest multiple units of this product. Yet perceiving greater unity in multiple identical replicates (vs. a single unit) is a critical part of our process, and our theory proposes that, indeed, multiple units convey such unity more clearly than a single unit. By showing that perceived entitativity mediates the effect of displayed quantity in study 2, we rule out the possibility that our results are driven by confusion over how to respond to the entitativity items in the single-unit condition (particularly given that efficacy perceptions were measured before entitativity). Further, we replicate our mediation findings in studies 3 and 4, both of which also measure efficacy perceptions prior to entitativity.

STUDY 3

According to our conceptualization, multiple product replicates increase product entitativity, and hence efficacy perceptions, by signaling unity around the products' shared benefit. An implication of this process is that alternative ways of signaling that a product is unified around a common benefit will also increase entitativity, and thus efficacy, even when a single product is presented. We test this aspect of our theory in study 3 by manipulating information about a product's active ingredients. When active ingredients are described as being unified around a single primary benefit to which each ingredient contributes, we predict that perceptions of product efficacy and entitativity will also be enhanced. However, when active ingredients are listed without explicit reference to a unifying benefit, we expect to replicate the effect of displayed quantity, such that multiple product replicates (vs. a single unit) enhance perceptions of both efficacy and entitativity.

Method

Participants and Design. Two hundred ninety-five undergraduate students ($M_{age} = 20.5$ years; 43.7% female) took part in study 3 for partial fulfillment of a course requirement. This was the final sample after we removed 58 (16.4%) participants on the basis of a failed attention check. Study 3 used a 2 (displayed quantity: single vs. multiple) × 2 (ingredients: control vs. unified) between-subjects design.

Procedure. We presented participants with an online shopping scenario in which they imagined seeing an advertisement for an immune booster that was being featured on the website they were visiting. Below the scenario introduction, we displayed an ad that provided the product's

name ("UltraFlora Immune Booster") and some information about the product's function ("Protect yourself this cold and flu season"). The ad also showed either one unit of the product or seven identical units of the product, depending on the displayed quantity condition to which participants were assigned (see appendix).

On the following page, participants were asked to imagine clicking on the ad to find out more about the product, at which time they were provided details about its active ingredients. It was at this point that we manipulated information about the unity of the immune booster's ingredients (see appendix). We took care to ensure that both conditions provided the same objective information about the ingredients, particularly relating to the efficacy of each ingredient, and only information about the unity of ingredients differed. In the control condition, the following information was provided: "UltraFlora Immune Booster includes three active ingredients to keep you healthy. Their functions are aimed at supporting your immune system." Below, the three active ingredients were listed in three separate boxes under the heading "IMMUNE SUPPORT." Thus, participants were informed that all ingredients contributed to product efficacy, but the concept of unity was not emphasized. In the unified ingredient condition, identical information about the ingredients was provided, but the description was subtly altered to emphasize the unity of the ingredients: "UltraFlora Immune Booster includes three active ingredients that **work together** to keep you healthy. Their distinct functions are aimed at **one unified goal**: Supporting Your Immune System" (terms in boldface appeared in the unified ingredient condition only). In addition, rather than listing the three ingredients in separate boxes, we presented the same three ingredients as three "puzzle pieces" that came together to form a circle under the heading "IMMUNE SUPPORT." Thus, both conditions provide the same objective information about the same three ingredients, with the only differences corresponding to the extent to which the ad emphasized the concept of these ingredients' unity.

After participants read about the product's ingredients, we administered our dependent measures. The page also redisplayed both the ad seen first (manipulating displayed quantity) and the information about the active ingredients. We included two measures of perceived efficacy: "If someone started taking UltraFlora Immune Booster, how much do you think it would protect them from getting sick?" (1 = Not at all; 9 = A great deal) and "How effective do you think UltraFlora Immune Booster is at keeping people healthy?" (1 = Not at all effective; 9 = Extremely effective). These items were highly correlated ($r = .85$, $p < .001$), and the average of the two therefore constitutes our dependent measure.

On the subsequent page, participants rated the perceived entitativity of the product by indicating their agreement with the same five items used in prior studies, adapted to refer to the UltraFlora product used in this study (1 = Strongly disagree; 9 = Strongly agree; see web appendix for details). The instructions asked participants, "Please indicate the extent to which you agree or disagree with the following statements about the **UltraFlora product(s) depicted in the ad** you just viewed" (boldface was included to focus attention on the UltraFlora products, rather than the ingredient information from the unity manipulation). Responses were highly correlated ($\alpha = .90$), and their average constitutes our measure of entitativity.

Participants then responded to a manipulation check asking them to think back to the information about UltraFlora's ingredients and respond to the following question: "How much did this part of the ad emphasize that the ingredients **work together** and are **unified** by a common function or purpose?" (1 = Not at all; 9 = A great deal). Finally, we collected participants' demographic information, debriefed them, and thanked them for their time.

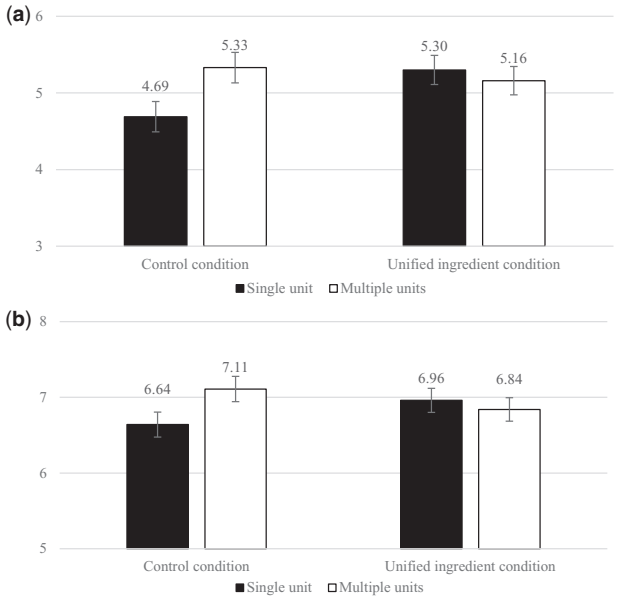
Results

Manipulation Check. A 2 (displayed quantity) × 2 (ingredient information) ANOVA on responses to the manipulation check revealed the expected main effect of the ingredient description ($F(1, 291) = 41.18$, $p < .001$; $\eta^2 = .124$). Participants reported that the ad emphasized the concepts of working together and unity more in the unified ingredient condition ($M = 7.28$, SD = 1.54) than the control condition ($M = 5.91$, SD = 2.10). Results also showed a marginally significant two-way interaction ($F(1, 291) = 3.11$, $p = .079$; $\eta^2 = .011$), the pattern of which suggested that—within the control condition—displaying multiple units of the product led to marginally greater reports of ingredient unity than displaying a single product ($M_{multiple} = 6.17$, $SD_{multiple} = 2.23$; $M_{single} = 5.66$, $SD_{single} = 1.96$; $F(1, 291) = 2.80$, $p = .095$; $\eta^2 = .010$). No difference between single and multiple products was found in the unified ingredient condition ($M_{multiple} = 7.16$, $SD_{multiple} = 1.67$; $M_{single} = 7.39$, $SD_{single} = 1.38$; $F < 1$). The simple effects of the unity manipulation were highly significant in both the single-unit and multiple-unit conditions (Fs(1, 291) > 10.9; ps < .002). While the interaction was not intended, the pattern is consistent with our proposal that entitativity relates to both the homogeneity of multiple identical products and the concept of unity around a shared benefit.

Perceived Efficacy. A similar 2 (displayed quantity) × 2 (ingredient information) ANOVA on perceptions of the immune booster's efficacy revealed only a significant two-way interaction ($F(1, 291) = 4.01$, $p = .046$; $\eta^2 = .014$; other ps > .19; see figure 1a). As hypothesized, we replicated the effect of displayed quantity in the control condition: multiple units ($M = 5.33$, SD = 1.53) led to greater perceived efficacy than a single unit ($M = 4.69$,

FIGURE 1

(A) PERCEIVED EFFICACY (STUDY 3), (B) PERCEIVED ENTITATIVITY (STUDY 3)



SD = 1.64; $F(1, 291) = 5.19$, $p = .023$; $\eta^2 = .018$). However, the effect of displayed quantity was attenuated in the unified ingredient condition ($M_{multiple} = 5.16$, $SD_{multiple} = 1.66$; $M_{single} = 5.30$, $SD_{single} = 1.78$; $F < 1$). Simple effects of ingredient information were also consistent with our hypotheses: when a single unit of the product was displayed, increasing the perceived unity of active ingredients resulted in significantly greater perceptions of efficacy ($F(1, 291) = 4.94$, $p = .027$; $\eta^2 = .017$). However, in the multiple product condition—when perceptions of entitativity and thus efficacy are already expected to be relatively high—the effect of ingredient information was nonsignificant ($F < 1$).

Entitativity. Entitativity results were also consistent with our conceptualization: a similar 2 (displayed quantity) × 2 (ingredient information) ANOVA on the entitativity composite revealed only a marginally significant two-way interaction ($F(1, 291) = 3.37$, $p = .067$; $\eta^2 = .011$; other ps > .29; see figure 1b). In the control condition, displaying multiple units ($M = 7.11$, SD = 1.31) led to greater perceived entitativity than displaying a single unit ($M = 6.64$, SD = 1.46; $F(1, 291) = 3.97$, $p = .047$; $\eta^2 = .013$). On the other hand, when participants were exposed to information increasing the perceived unity of the active ingredients, the effect of displayed quantity did not significantly impact perceptions of product entitativity ($M_{multiple} = 6.84$, $SD_{multiple} = 1.45$; $M_{single} = 6.96$; $SD_{single} = 1.31$; $F < 1$).

Mediation. We tested for mediation of product efficacy by perceived entitativity using Hayes's (2013) PROCESS macro for SPSS (model 8). Results supported our conceptualization: the indirect effect of the two-way interaction on perceived efficacy through entitativity did not cross zero ($b = -.24$, SE = .14; 95% CI [−.566, −.001]), and the direct effect of the two-way interaction on perceived efficacy became nonsignificant when entitativity was included in the model ($p = .15$). The indirect effect for the simple effect of displayed quantity in the control condition also did not cross zero ($b = .19$, SE = .10; 95% CI [.019, .443]), and entitativity perceptions significantly predicted efficacy ($b = .41$, SE = .07, $t(290) = 6.14$, $p < .0001$).

Discussion

Study 3 provides support for our conceptualization through both moderation and mediation. Speaking to the former, when participants were led to view the immune booster as unified by the functional benefit provided by each of its active ingredients, the effect of displayed quantity was attenuated. This is consistent with our proposal that multiple product replicates increase efficacy by increasing perceptions that products are unified by a common benefit: when this perception is influenced through means other than displayed quantity, no difference between the single-unit and multiple-unit conditions is observed. Study 3 offers further support for our theory by showing that ratings of product entitativity mirror those of perceived efficacy, and perceptions of entitativity mediate product efficacy.

STUDY 4

Study 4 explores the generalizability and boundaries of the effect of displayed quantity, focusing on two potential boundary conditions. First, the different products used as stimuli in our prior studies happen to be perishable products that derive their efficacy from chemicals or other "active ingredients." However, our conceptualization does not place any particular importance on the type of product under consideration; rather, we propose that the critical driver of displayed quantity's effect on efficacy perceptions is the opportunity to perceive unity around a primary benefit, which can apply both to perishable products with chemically based benefits and to durable products with mechanically based benefits. Therefore, the first goal of study 4 is to provide evidence that the effect of displayed quantity generalizes to durable (vs. perishable) product categories. We accomplish this goal by manipulating displayed quantity in a durable product category—electric mops—whose efficacy is based on mechanical functions, rather than chemical ones. In doing so, we also aim to rule out the alternative explanation for our prior results positing that a

single unit is perceived as less effective than multiple replicates because it is more perishable than multiple products.

The second boundary condition we explore in study 4 relates to the product judgments impacted by the presence versus absence of product replicates. Given extant research showing that entitativity influences perceptions of group members' abilities to achieve the group's goals (Callahan and Ledgerwood 2016; Clark and Wegener 2009), our studies have aimed to show that product entitativity influences perceptions relating to the products' goal—that is, the desired outcome of product consumption. However, extant research does not make it clear whether the impact of group entitativity should extend to other perceptions of group members that are unrelated to the goal that group members collectively pursue. Because an overarching effect of entitativity in social groups relates to group intentions and groups' abilities to act on intentions (Abelson et al. 1998; Clark and Wegener 2009; Dasgupta et al. 1999), both of which are related to groups' goals (Callahan and Ledgerwood 2016), we expect product entitativity to influence perceptions related to product outcomes (i.e., the products' "end goal") more strongly than perceptions related to other considerations, such as how easy or difficult it is to use the product. We test this aspect of our conceptualization in study 4 by assigning participants to two different conditions in which they report perceptions of either product efficacy or user friendliness. Note that while product efficacy is closely related to the primary benefit consumers seek from product usage, user friendliness relates more to the process of obtaining this benefit.[4] We thus explore whether displayed quantity has the same impact on perceptions of user friendliness that it has on perceptions of product efficacy.

Method

Participants and Design. One hundred ninety-nine undergraduate business students (M_{age} = 19.7 years, 51.8% female) took part in study 4 for partial fulfillment of a course requirement. This was the final sample after we removed 32 participants (13.9%) on the basis of a failed attention check. The design of study 4 was a 2 (displayed quantity: single vs. multiple) × 2 (product perception measured: product efficacy vs. user friendliness) between-subjects design.

Procedure. We asked participants to imagine they were shopping at a department store. The scenario described that, as participants walked into the store, they were handed some flyers for featured products, one of which was for an electric floor mop called Quick Shine. Below the scenario description, we presented a flyer advertising the Quick Shine. The flyer provided basic information about the product, along with our manipulation of displayed quantity. In the single-unit condition, the flyer showed an image of one electric mop; in the multiple-unit condition, five identical mops were shown. The rest of the flyer did not differ between conditions (see appendix).

We administered the dependent measures on the following page, which differed according to the condition to which participants were randomly assigned. In the product efficacy condition, we included two measures of the effectiveness of the mop: "How effective do you think the Quick Shine would be at cleaning your floors?" (1 = Not at all effective; 9 = Extremely effective) and "How much cleaner do you think your floors would be after using the Quick Shine?" (1 = Not much cleaner; 9 = Much cleaner). Responses were highly correlated (r = .715, p < .001), and the average of the two constitutes our dependent measure in the product efficacy condition. In the user friendliness condition, participants instead responded to the following two questions: "How user friendly do you think the Quick Shine is?" (1 = Not very user friendly; 9 = Very user friendly) and "How easy do you think it is to use the Quick Shine to clean your floors?" (1 = Not very easy; 9 = Very easy). Responses were highly correlated (r = .818, p < .001), and their average constitutes our dependent measure in the user friendliness condition.

Afterward, all participants responded to the same five entitativity measures, adapted from our prior studies to fit the product used in this study (1 = Strongly disagree; 9 = Strongly agree; see the web appendix for details). Responses were highly correlated (α = .91), and we use the average of the five items as our entitativity measure. Participants then provided demographic information before being debriefed and thanked for their time.

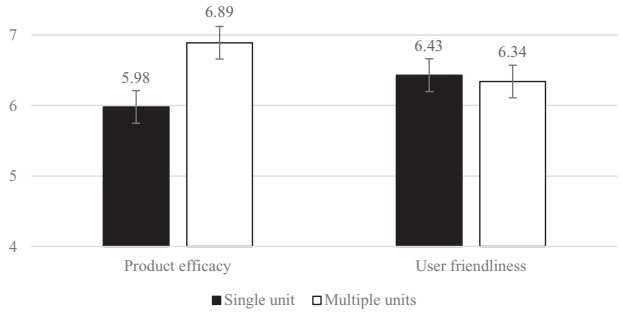
Results

A 2 (displayed quantity) × 2 (product perception measured) ANOVA on the dependent measures participants were asked to respond to (i.e., product efficacy vs. user friendliness) revealed a marginally significant main effect of displayed quantity (F(1, 195) = 3.15, p = .078; η^2 = .016): collapsing over the product perception measured, ratings tended to be higher in the multiple-unit condition (M = 6.62, SD = 1.55) than the single-unit condition (M = 6.20, SD = 1.73). However, this pattern was qualified by a significant two-way interaction (F(1, 195) = 4.65, p = .032; η^2 = .023; see figure 2), showing that the observed main effect was driven entirely by perceptions of product efficacy: when participants reported perceptions of product efficacy, we replicated our prior results such that the mop was perceived to be significantly more effective when multiple units were shown (M = 6.89, SD = 1.08) than when a single unit was shown (M = 5.98, SD = 1.79;

4 Please see the pretest for study 4 in the web appendix, which verifies that product efficacy and user friendliness are differentially related to the primary benefit consumers seek from the product used in the study.

FIGURE 2

PRODUCT PERCEPTIONS (STUDY 4)



$F(1, 195) = 7.76$, $p = .006$; $\eta^2 = .038$). In contrast, when participants reported perceptions of user friendliness, displayed quantity had no effect ($M_{multiple} = 6.34$, $SD_{multiple} = 1.88$; $M_{single} = 6.43$, $SD_{single} = 1.66$; $F < 1$). These results suggest that displayed quantity impacts perceptions related to the essential benefit of product usage, but does not affect perceptions of product dimensions that are not directly related to this essential desired outcome.

Entitativity. A similar ANOVA on perceptions of entitativity revealed only a significant main effect of displayed quantity ($F(1, 195) = 14.74$, $p < .001$; $\eta^2 = .070$; other Fs < 1). Regardless of the product perceptions participants reported when responding to the dependent measures, those in the multiple-unit condition reported significantly higher perceptions of entitativity ($M = 7.58$, SD = 1.32) than those in the single-unit condition ($M = 6.69$, SD = 1.86). This is consistent with our theory: multiple units should lead to greater entitativity perceptions than a single unit regardless of the preceding measures. Moreover, for those in the product efficacy condition, perceptions of entitativity mediated the effect of displayed quantity on perceived product efficacy (indirect effect: $b = .34$, SE = .18; 95%CI [.082, .794]).

Discussion

Study 4 increases the practical implications of displayed quantity by generalizing the effect to categories in which product efficacy is based on mechanical functions, rather than chemical functions. Our stimuli were also designed to be similar to the kinds of advertisements and flyers often encountered in the marketplace; together with the online retailing contexts used in studies 2 and 3, these results speak to the opportunities marketers have to leverage the beneficial effects of displayed quantity. Study 4 also extends the contributions of the present work by showing that the presence or absence of product replicates is more likely to impact product perceptions that are related to the primary benefit of product usage. As our theory describes, multiple product replicates increase perceptions of entitativity, which involves perceiving that products are unified by their shared benefit. Study 4 shows that when participants consider product attributes that are less related to the primary desired outcome, no effect of displayed quantity is observed. This provides additional insights to practitioners concerning the circumstances in which displayed quantity is more or less likely to impact consumer perceptions.

STUDY 5

Study 5 aims to test whether the effect of displayed quantity on perceived efficacy leads a product to actually become more effective, consistent with research on marketing placebo effects (Irmak, Block, and Fitzsimons 2005; Shiv et al. 2005). We provided participants in study 5 with a performance-enhancing product that was inside a package containing either a single unit or multiple units of the product; we asked all participants to consume one unit of the product and subsequently measured actual performance. By extending our operationalization of displayed quantity to packaging format, and testing these effects in the context of actual consumption and task performance, we also build on recent findings demonstrating that, when consumers have limited processing capacity, they derive more efficacy from products taken from single-serving (vs. multi-serving) packages (Ilyuk and Block 2016). We extend these findings by proposing that, when consumers have *sufficient* processing capacity, two competing processes determine whether a product taken from a package including multiple units or a single unit will be more or less effective: first, the present research suggests that consumers should derive more efficacy from multiserving (vs. single-serving) contexts when the products in the multiserving context are perceived as a homogeneous and unified group, which implies a shared functional benefit that defines each unit in the group. However, operationalizing displayed quantity via packaging and asking participants to physically take a product from such packages introduces proportional information regarding what is (vs. is not) consumed; therefore, a second possibility, as identified by Ilyuk and Block (2016), is that consumers may derive more efficacy from single-serving packages due to perceiving that they have consumed all (vs. part) of the available resources in the single-serving (vs. multiserving) package condition.

We propose that individual differences in consumers' tendency to process information holistically (Choi et al. 2007) determine which of these two effects are observed: individuals who process information more holistically integrate contextual information with focal information and focus more on the whole context than the parts composing the whole. In contrast, individuals who process less holistically separate focal information from contextual

information and focus more on the parts composing the whole than the whole itself. In other words, more holistic processors are likely to create a unified whole from constituent elements, while less holistic processors are unlikely to do so (Monga and John 2007, 2010; Zhu and Meyers-Levy 2009). Thus, we predict that more holistic processors' performance will primarily be driven by perceiving products inside a multiserving package as unified by their benefit, and the downstream consequences of this perception that were shown in prior studies. As a result, product efficacy should be higher for the multiserving (vs. single-serving) package when consumers process more holistically, extending the findings from studies 1–4. On the other hand, less holistic processors are unlikely to view individual objects as a unified whole, and instead should consider individual units separately. As a result, they will likely be unaffected by product entitativity. Rather, the act of consuming the complete contents of the single-serving package, wherein no parts are left unconsumed (vs. consuming a proportion of the contents in the multiserving package, wherein several parts are left unconsumed), may drive the efficacy that less holistic processors receive from products. In this case, products taken from single-serving packages would lead to greater derived efficacy than products taken from a multiserving package for less holistic processors.[5]

Method

Participants and Design. Two hundred seven (M_{age} = 19.4 years; 50.2% female) undergraduate students participated in study 5 for partial completion of a course requirement or extra credit. This was the final sample after we excluded 43 participants (17.2%) who failed the attention check. The design was a 2 (displayed quantity: single vs. multiple) × continuous (holistic processing) between-subjects design, where displayed quantity was manipulated between-subjects and holistic processing was a measured continuous variable.

Procedure. Participants were first informed that the study would involve consuming a performance-enhancing product called Gatorade Energy Chews. After confirming their willingness to consume this product, participants were given a small baggie containing either a single Gatorade Energy Chew (in the single displayed quantity condition) or six Gatorade Energy Chews (in the multiple displayed quantity condition). Participants had been randomly assigned to a condition at the beginning of the lab session when the lab administrators on duty assigned participants to cubicles. The behavioral lab where this study was conducted is divided into two halves; all participants seated on one side of the lab for a given session were in one condition, and all participants seated on the other side of the lab for that session were in the other condition (condition assignments were rotated each session to avoid potential confounds).

After handing out the baggies containing the product, we provided participants with more information about Gatorade Energy Chews through the computer-based survey: participants were told that this product contained ingredients that had been shown to improve reflexes, concentration, and memory; that each chew had enough of these ingredients to boost performance for one hour; and that the recommended dose was one chew per hour (in reality, a single serving includes all six chews included in a package).[6] After receiving this information, participants in the single displayed quantity (multiple displayed quantity) condition were asked to eat the chew (one of the chews) they had been given and to hand the empty baggie (uneaten chews) back to the lab administrator. Note that this procedure is similar to studies by Ilyuk and Block (2016), in which participants consumed either the entire contents of a package or a proportion of the available contents.

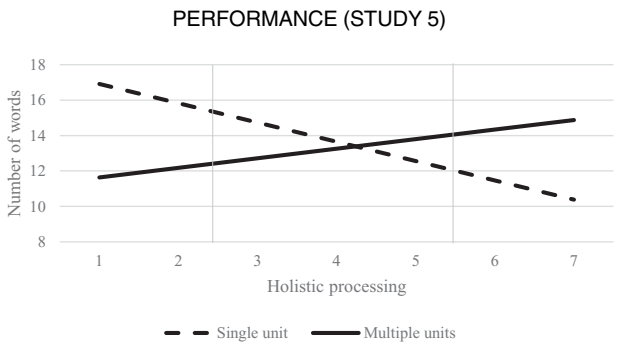
Once participants had consumed the chew and completed a short filler task to ostensibly allow the product to be absorbed into the bloodstream, they were directed to the performance task. This task, called "Word Prospector," presented participants with a 10-letter word and asked them to come up with as many words of four or more letters using only the letters from the 10-letter word. We informed participants that each letter from the original word could be used only once per new word, and only words that were spelled correctly and could be found in the Oxford English Dictionary would be counted. Participants completed one unscored practice task, followed by two scored trials. Each trial lasted 60 seconds, during which participants could enter as many words as possible. Thus, this task requires both physical performance (typing quickly without making errors) and mental performance (thinking of acceptable words).

Following the completion of the performance task, we measured participants' knowledge of Gatorade Energy Chews to ensure that familiarity with this product would

5 Note also that, in the context of our research, multiple product replicates imply individually identifiable units that may be perceived to form a unified whole. In contrast, both the single- and multiserving packages studied by Ilyuk and Block (2016) involve a single unit (i.e., the package), and the amount of the product inside the package varies (e.g., 1 ounce vs. 32 ounces of Gatorade powder in study 1). Due to these conceptual distinctions, holistic processing is a more relevant moderator of the process underlying the effect of quantity in our research than that of Ilyuk and Block.

6 At the time of running the study, Gatorade Energy Chews were available for purchase only online or at Walgreens. While they had been on the market for some time, interviews with undergraduate students from the same subject population indicated that the product was not very well known, suggesting that we could tailor information about the product to suit the purposes of the study without raising suspicion. We also collected data regarding whether participants knew the size of a package or the size of a serving; few participants did, and results were unaffected by the removal of participants on this basis.

FIGURE 3



not influence the effectiveness of our manipulation. We then administered the measure of holistic processing, using the six-item locus-of-attention subscale from Choi, Koo, and Choi's (2007) Analysis-Holism scale. Example items include "It is more important to pay attention to the whole than its parts" and "The whole, rather than its parts, should be considered in order to understand a phenomenon" (1 = Strongly disagree; 7 = Strongly agree; $\alpha = .75$). Finally, we collected demographic information, debriefed participants, and thanked them for their time.

Results

Participants came up with 0–32 acceptable words across the two scored tasks ($M = 13.30$, SD = 5.13). We regressed the number of acceptable words on the displayed quantity condition to which participants were assigned, participants' mean-centered holistic processing score ($M = 4.42$, SD = 1.05), and the interaction of these two variables. Results revealed only a significant two-way interaction ($b = 1.63$, $t(203) = 2.41$, $p = .017$; see figure 3). We probed this interaction with floodlight analysis to identify the regions of holistic processing for which the effect of displayed quantity was significant (Spiller et al. 2013). Results revealed that participants in the multiple (vs. single) displayed quantity condition performed significantly better when holistic processing was greater than or equal to 5.44 (i.e., .97 SD above the mean; $b = 1.96$, $t(203) = 1.97$, $p = .050$), while participants in the single (vs. multiple) displayed quantity condition performed significantly better when holistic processing was less than or equal to 2.33 (i.e., 1.99 SDs below the mean; $b = -3.12$, $t(203) = -1.97$, $p = .050$).

Discussion

Study 5 shows that the presence of product replicates not only impacts perceptions of product efficacy, but also influences actual experiences with products: participants who process information more (vs. less) holistically performed significantly better on a task requiring a combination of mental and physical performance when consuming a product in the presence (vs. absence) of multiple product replicates. This study thus extends the practical implications of presenting multiple product replicates beyond the advertising and special display contexts to product packaging and consumption contexts, while also attesting to the reliability and robustness of our effects. In addition, we build on recent findings by Ilyuk and Block (2016) by demonstrating that both single-serving and multiserving package formats can lead to increased product efficacy, depending on consumers' processing style. In doing so, we extend our package of studies to illustrate a context in which multiple identical replicates may lead to less efficacy than a single unit, adding to our prior studies that show situations in which multiple replicates are perceived as more efficacious than, or equally efficacious to, a single product. Note that, while this effect may appear inconsistent with the results of studies 1–4 (in which we observed main effects of displayed quantity, regardless of individual differences in holistic processing), the experimental procedure of study 5 increases the importance of differences in holistic processing for our effect. In particular, study 5 involves the physical handling and consumption of a product (in the presence vs. absence of other products), whereas studies 1–4 involve reporting evaluations of product images without necessarily imagining how the product(s) would be consumed. These differences make proportional information regarding what is (vs. is not) consumed more relevant for study 5, making some participants who were not influenced by proportional effects in studies 1–4 likely to be influenced by these effects in study 5.

It is noteworthy here that prior research by Bartels and Burnett (2011) demonstrates that depicting people as groups (vs. individuals) increases proportion dominance. Specifically, Bartels and Burnett (2011) showed that when a group of needy individuals was depicted as individuals (stick figures moving independently), participants were less sensitive to the proportion of individuals being saved than when they were presented as a group (stick figures moving in unison). While the pattern of results found in study 5 (in which we show greater reliance on proportionality from less holistic processors) may appear inconsistent with Bartels and Burnett's (2011) findings, important differences between our conceptualization and study context help to resolve this apparent inconsistency. In particular, Bartels and Barnett's (2011) findings apply to very different dependent variables than ours (i.e., saving lives vs. receiving energy from products). In the context of saving individuals who are depicted as a group, saving more of the group is likely to become salient, enhancing proportion sensitivity due to loss aversion. When victims are construed as individuals, on the other hand, each life becomes valuable on its own, reducing proportion sensitivity. This is consistent with work in entitativity showing that individuals in highly entitative groups (such as a large group of

identical-looking stick figures moving in unison) are devalued (Crawford et al. 2002; Dasgupta et al. 1999); thus, saving a few victims who are depicted as individuals is perceived as more valuable than saving the same number of victims who are perceived primarily as interchangeable members of a (large) group. In other words, the fact that we use a product context and Bartels and Burnett (2011) focus on humans impacts the relative importance of entitativity and proportional considerations. Overall, our results demonstrate that greater holistic processing results in greater influence of product entitativity than proportion dominance in the context we study, at least to the extent that proportional information is not directly relevant for making efficacy judgments.

GENERAL DISCUSSION

This research explores how presenting a product as part of a group of product replicates (vs. as an individual product) impacts consumers' perceptions of product efficacy. Building on the product quantity and entitativity literatures, we demonstrate that viewing multiple product replicates leads consumers to perceive products as more entitative: consumers view the products as homogeneous and unified around their shared benefit (pretest for study 1; studies 2, 3, and 4). As a result, presenting multiple product replicates (vs. a single unit) results in greater product efficacy perceptions (studies 1–4) and experiences (study 5). In support of our proposed process, we find that entitativity perceptions mediate the effect of displayed quantity on product efficacy across three studies, each of which operationalizes displayed quantity in a distinct product category (study 2: energy enhancers; study 3: pharmaceuticals; study 4: electric mop). Our results also provide supportive evidence through moderation and show boundary conditions. Specifically, we demonstrate that alternative sources of information leading consumers to view products as unified by the products' benefit have the same effect on product entitativity and efficacy that displayed quantity has (study 3), and we show that the effect of displayed quantity is specific to perceptions related to a product's essential benefit (study 4). Finally, these effects also impact actual product efficacy, such that a product taken from a setting in which product replicates are present (vs. absent) is more effective for individuals who process information more (vs. less) holistically (study 5).

Theoretical Contributions

Our findings make two primary theoretical contributions. First, while much research has been devoted to studying differences in product quantity, and some research has involved exposure to identical information or stimuli (Bartels and Burnett 2011; Weaver et al. 2007), this is the first investigation dedicated to understanding how perceptions of a product differ depending on whether a product appears in isolation or as part of a group of product replicates. Moreover, we find that products are perceived to be more effective when presented as part of a group of product replicates (vs. in isolation), and that this effect is driven by perceiving products as more similar and unified by their shared benefit. Thus, we contribute to the literature on product quantity (Castro et al. 2013; Parker and Lehmann 2011; van Herpen et al. 2009, 2014) by revealing that, under certain conditions, a large quantity of products is perceived more favorably than a small quantity.

Second, we contribute to past literature on entitativity through a dedicated examination of product entitativity in which we show that presenting a group of multiple identical product replicates results in greater perceptions of product entitativity than presenting a single product. While previous research in marketing and psychology has shown that entitativity is perceived in groups of people (Smith et al. 2013; Yzerbyt et al. 1998) and groups of humanoids (Morewedge et al. 2013; Wai-man Ip, Chiu, and Wan 2006), less is known about how entitativity perceptions manifest in groups of products (Gürhan-Canli 2003; Mishra 2009). Moreover, our conceptualization derives and tests predictions for why the increase in entitativity caused by multiple replicates (vs. a single unit) translates to greater product efficacy, further contributing to research in entitativity: multiple product replicates lead consumers to perceive products as more similar and unified by their primary benefit, increasing perceptions of how effectively products deliver this benefit. Thus, the effect of displayed quantity on entitativity influences perceptions of product efficacy, while judgments of product dimensions less related to the primary desired outcome of product consumption are not impacted by displayed quantity (study 4). In keeping with our theory, other ways of signaling unity around a primary benefit also increase entitativity and efficacy perceptions (study 3). While related research has shown that entitativity influences competence perceptions (Callahan and Ledgerwood 2016; Clark and Wegener 2009), and that a brand's homogeneity (closely related to entitativity) polarizes judgments (Smith 2015), the present research is the first to demonstrate that entitativity influences the perceived (and actual) effectiveness of products.

It is noteworthy that we find greater entitativity for a group of multiple products than a single unit, as research involving humans often finds that an individual person is higher in entitativity than a group of people (Hamilton and Sherman 1996; Kashima et al. 2005; McConnell et al. 1997). Indeed, this is the first demonstration of which we are aware that a group may be perceived as more entitative than an individual. However, there are important differences between inanimate products and human beings that relate to the drivers of entitativity and help explain this apparent discrepancy. First, an individual person is assumed to be homogeneous and coherent in the sense that

his or her behavior is guided by a stable essence or disposition (e.g., personality; Hamilton and Sherman 1996; Rydell and McConnell 2005; Susskind et al. 1999); if an individual does not exhibit such stability and coherence, his or her entitativity declines (McConnell et al. 1997). However, an individual product cannot be stable or coherent by itself, as a product is subject to the actions of its user. Indeed, it is only through the production of identical product replicates that a particular product can gain its own status of being a stable and coherent entity: multiple product replicates convey that—regardless of any particular user—there is an inherent core quality that unifies the products.

Second, because every individual person is unique, even highly homogeneous groups are characterized by differences between members. As a result, a group comprising more than one individual person is lower in entitativity than a single person. However, this rule does not apply to product replicates, which can be legitimately identical. Thus, increasing the size of a display of products from one unit to more than one unit does not have a commensurate drop in homogeneity or similarity, as increasing the size of a group from one person to more than one person necessarily does.

While the present research helps us better understand how consumers interpret quantity, it also differs from past work on the numerosity heuristic (Pelham, Sumarta, and Myaskovsky 1994) in key ways. Pelham and colleagues (1994) showed that, keeping actual quantity constant, consumers are sensitive to numerosity as a cue for judging quantity or probabilities, such that equal quantities depicted in more fine-grained expressions (e.g., $1 in 10 dimes vs. four quarters) are perceived as containing greater quantity. In contrast to the numerosity heuristic, our studies manipulated actual quantity (i.e., the number of product replicates) as our main independent variable, showing that this factor influences perceptions of product effectiveness (a dependent variable that past work on the numerosity heuristic has not examined). The present work also extends our knowledge of how consumers interpret quantity information beyond the numerosity heuristic by showing that the effect of displayed quantity on perceived and actual effectiveness is driven by perceptions of product entitativity, not expectations of how much of the product would be consumed (see the web appendix for results of relevant alternative explanations). Indeed, the effect holds for durable products (study 4) and in the context of actual product usage when the quantity consumed is held constant (study 5).

Managerial Implications and Directions for Future Research

Our work also has important practical implications. First, there are myriad contexts in which consumers observe products presented either in isolation or among replicates (online retailing, advertising, in-store displays, sampling tables, etc.). Our studies suggest that presenting multiple product replicates (vs. a single product) in contexts such as these has benefits for how consumers perceive products and the expectations they form for product efficacy. Moreover, as demonstrated in study 3, entitativity can be signaled both perceptually and conceptually, suggesting that the managerial implications of product entitativity are general and important: marketers can increase entitativity both through displays that depict multiple identical products as a unified group, and by describing the unifying function or benefit that defines a product. Given that these tools are relatively inexpensive to implement (i.e., no changes to product packaging or ingredient formulation must be made) and that the display of both single and multiple product replicates in the studied contexts is prevalent, our findings should be of great interest to practitioners. That said, we note that our studies relied on between-subjects manipulations of displayed quantity, and it may therefore be important for future researchers to test how these effects generalize to more noisy retail environments in which multiple product replicates may be present for some brands but absent for others.

Furthermore, the present findings suggest not only an easy and inexpensive, but also a novel, method for marketers to improve perceptions of products evaluated on the basis of perceived efficacy (Zhu, Billeter, and Inman 2012). While past research has shown that consumers react more favorably to shelf-based scarcity when judging a product (Castro et al. 2013; Parker and Lehmann 2011), the present findings suggest that the presentation of a greater quantity of items in less conventional retailing and advertising contexts may actually lead to improved perceptions of product benefits. That said, as expecting greater efficacy may have unintended consequences relating to the quantity consumed (Zhu et al. 2012), testing how displayed quantity impacts consumption patterns is a worthwhile avenue for future research.

Our work also demonstrates that both single-serving and multiserving packaging formats can increase the efficacy consumers derive from products. This suggests that marketers should base their product packaging strategies on such considerations as: (a) the extent to which a target market is likely to process information holistically (e.g., Eastern and Western cultures differ according to holistic processing; Choi et al. 2007; Monga and John 2007, 2010); (b) the likelihood of consumers processing information more or less heuristically (Ilyuk and Block 2016); and (c) the extent to which individual units in a multiserving package lend themselves to perceptions of unity. As each of these factors influences the efficacy consumers expect and experience, basing packaging strategies on these considerations can help marketers give consumers the most effective products possible.

In addition, our work has implications for future research. One important future direction is to examine how the effect of presenting multiple product replicates extends to other contexts and product categories. For example, given the importance of perceiving homogeneity and unity

for product entitativity, future research could explore how the effects of displayed quantity generalize to displays featuring multiple products from a single brand that differ from one another in some way (e.g., flavor or dosage). On the one hand, the presence (vs. absence) of variety implies less homogeneity of the group. On the other hand, different versions may still be unified around the same core function, leading to greater entitativity for multiple (different) units than a single isolated unit. Similarly, the effect of displayed quantity may be attenuated when multiple replicates are less likely to be perceived as a homogeneous group (e.g., when products are spread out vs. close together). Research aimed at such questions would both further our understanding of product entitativity perceptions and provide additional practical insights.

While our studies provide some evidence for generalizability by using different categories (i.e., detergents, energy enhancers, pharmaceuticals, and household appliances), these categories can be defined according to a single primary benefit. We chose to study efficacious products for this very reason, yet the effects shown in our studies may either generalize or change in meaningful ways when extended to other types of categories. For example, while efficacious products should be chosen on the basis of efficacy expectations, consumers' preferences in other product categories may depend on additional attributes and considerations. For instance, if a product category does not have a central function or benefit, or if consumers have different preconceived notions about what the central function or benefit of a product category is, presenting multiple replicates from these categories may not reliably affect entitativity perceptions or increase purchase likelihood. That is, the effect of entitativity on efficacy perceptions is based on perceiving products as similar and unified by their shared primary benefit; if there is not a clear primary benefit, there is no clear basis for unity (and thus product entitativity). This suggests it may be important for marketers to segment consumers according to the primary reason for purchasing a given type of product in order to take advantage of presenting multiple replicates. It may also be possible for marketing communications to position products according to a single primary benefit, even if those products would normally be evaluated according to multiple benefits. For example, complex products such as vehicles provide multiple critical benefits. If a marketer can prime consumers to view a particular benefit (e.g., safety) as most important and subsequently depict several identical offerings as a unified group, this may communicate the centrality of that attribute for the products and improve relevant product perceptions. An alternative to this strategy, implied by the results of study 3, may be to position the various product attributes as a set of parts that help achieve a unified goal (e.g., a lane-departure system, automatic braking, rearview camera, and parking sensors can be unified by the concept of safety). Generally speaking, exploring the relationship between entitativity perceptions and purchase likelihood across different categories is an important avenue for future research.

Another interesting future direction is to examine whether grouping product replicates may also backfire in some contexts. For example, if a product or brand's primary feature relates to a benefit that negatively correlates with quantity (e.g., environmental friendliness, exclusivity, or uniqueness), presenting multiple products may increase entitativity, but product evaluations may not increase (and may even decrease) because the unifying benefit conflicts with the product display (e.g., a greater quantity of products is objectively less environmentally friendly, exclusive, and unique than a smaller quantity of products). Furthermore, we showed evidence for the effect of displayed quantity on perceived effectiveness across situations that involved utilitarian products, but there may be interesting consequences of extending this study to hedonic categories. For example, if consumers perceive that multiple identical chocolates are more decadent or indulgent than a single chocolate, this may increase expectations of satiation and decrease, rather than increase, willingness to purchase the chocolates. Related to this point, while we did not find evidence that multiple replicates elicit more or less attention than a single unit in our studies, there may be situations in which displayed quantity interacts with other factors (e.g., product knowledge or involvement) to influence how much consumers pay attention or where in the display they focus their attention, potentially enhancing or attenuating the effect of product quantity. Exploring the various boundary conditions and moderators of the effect of displayed quantity is an important future direction. By studying these questions, future research can build on the present work and advance our understanding of how differences in quantity impact product evaluations under different conditions, helping marketers leverage the influence of these processes.

DATA COLLECTION INFORMATION

Data for studies 2, 4, and 5 were collected by research assistants at the University of Miami Marketing Behavioral Laboratory, under the supervision of the first and/or second authors. Data for study 3 were collected at the University of Georgia under the guidance of the third author. Data for studies 1 and 1b, and the pretests for studies 1, 1b, and 4, were collected online through Amazon Mechanical Turk by all authors. Data for study 1 were collected in the summer of 2016; data for study 1b were collected in the spring of 2017; data for study 3 were collected in the fall of 2018; data for study 2 and study 4 were collected in the spring of 2019; data for the pretests for studies 1, 1b, and 4 were collected in the summer of 2019; and data for study 5 were collected in the fall of 2014. The first author was primarily responsible for data analysis of each study, under the guidance of the second and third authors.

APPENDIX

STUDY 1

Multiple displayed quantity condition

Single displayed quantity condition

STUDY 1B (WEB APPENDIX)

Multiple displayed quantity condition

Single displayed quantity condition

STUDY 2

Fifteen-unit condition

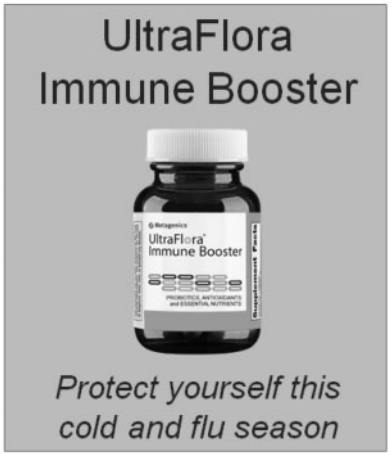
Two-unit condition

Single-unit condition

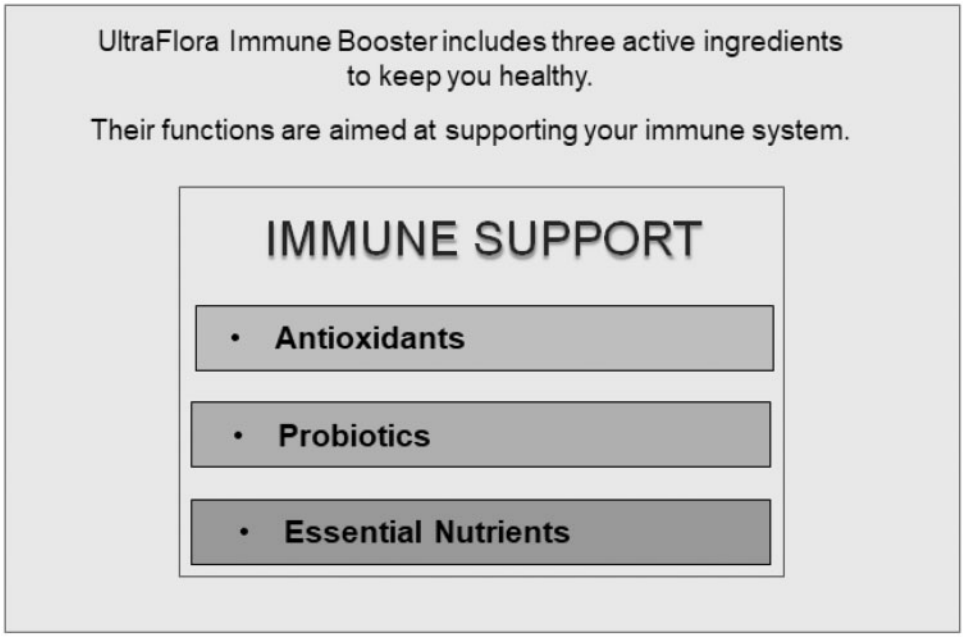
STUDY 3

Multiple displayed quantity condition

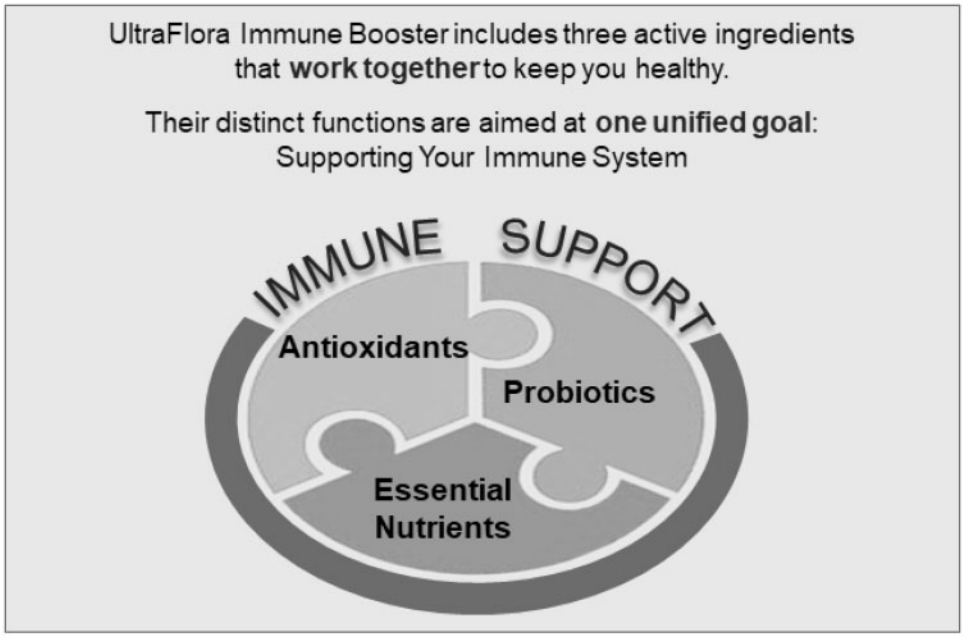
Single displayed quantity condition



Control condition

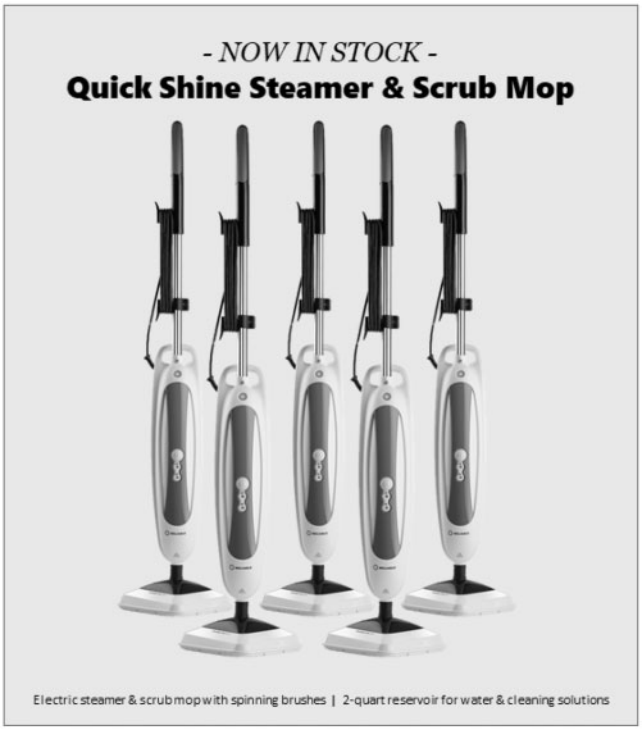


Unified ingredient condition

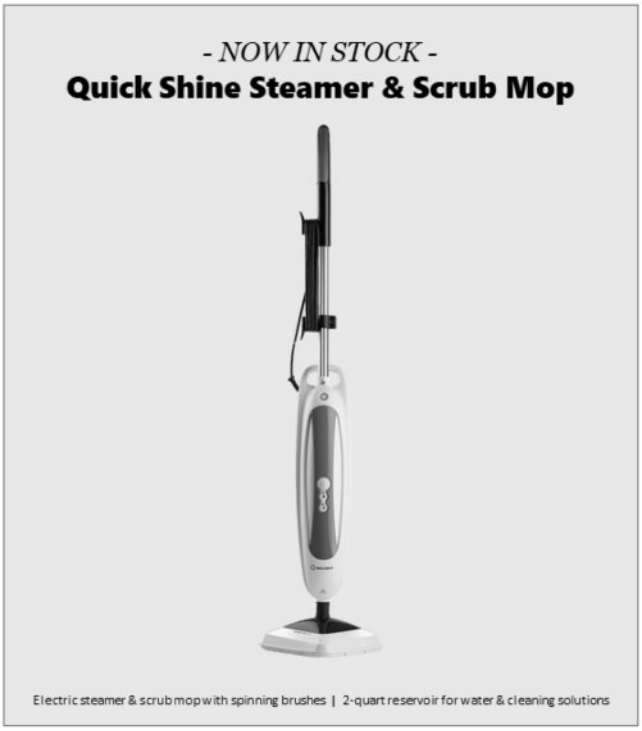


STUDY 4

Multiple displayed quantity condition



Single displayed quantity condition



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