Journal of Korea Trade Vol. 26, No. 6, October 2022, 83-95
https://doi.org/10.35611/jkt.2022.26.6.83
ISSN 1229-828X

Effects of Box Shape and Diverse Components of Large-Sized Products on Consumers' Product Evaluations in Logistic Business*

JKT 26(6)

Received 29 August 2022
Revised 16 September 2022
Accepted 7 October 2022

Dongkyun Ahn
Yonsei Business Research Institute, South Korea

Seolwoo Park†
Department of Business Administration, Jeju National University, South Korea

Abstract

Purpose – With the recent spread of COVID-19, U.S. consumers' consumption pattern is changing towards purchasing large-capacity products, as they stay at home longer. Thus, the current research investigates the effects of box shape and component diversity for large-sized products on product evaluation in logistic business. Moreover, this research examines that information-processing fluency mediates the moderating effects of box shape and product components on target evaluations to confirm psychological mechanism for generating this effect.

Design/methodology – In order to examine the hypotheses, the current research conducts two online experiments. The 184 participants (Study 1), and 205 participants (Study 2) of U.S. nationality were recruited through Amazon Mechanical Turk. This research analyzes the data by using SPSS 25 and PROCESS macro 4.0.

Findings – Study 1 demonstrates that when the height of a box is greater than its width, products with single components promote positive target evaluations, while when the width of box is greater than its height, products with a variety of components lead to positive target evaluations. Study 2 shows that the same results are replicated in other product categories and with different box shape ratios. Moreover, Study 2 also finds that the ease of information processing mediates the interaction effects of box shape and component diversity on U.S. consumers' target evaluations.

Originality/value – The current research has originality in that it investigates the effect of box shape and product composition diversity on U.S. consumer product evaluation from the perspective of information-processing theory Moreover, this research has practical implications for global traders who prepare for entering the U.S. market.

Keywords: Box shape. Diversity Component, Global Trader, Large-Capacity Product, Logistic Business

JEL Classifications: C90, F18, M31

1. Introduction

With the recent spread of COVID-19, many industries are making efforts to reduce, as much as possible, the face-to-face contact involved in consumption. Thus, online sales surged in the U.S. market since the advent of COVID-19. According to a statistical survey conducted by Nielsen, when shopping online, U.S. consumers' consumption pattern are changing by

* This research was supported by the 2022 scientific promotion program funded by Jeju National University.
† **Corresponding author:** swpark@jejunu.ac.kr

purchasing large-capacity products once they buy them. This change could serve as a new opportunity for many companies aiming to enter the U.S. market.

The elements of large-capacity products can be primarily divided into box shapes and product components. For example, large-capacity products may contain several single products and various types of products. Moreover, the product's boxes may vary in size: It may be longer in height than width or longer in width than height. According to previous research, consumers perceive quantities of items as smaller for mixed components than for single products (Redden and Hoch, 2009). This is because people process the product quantity information by using clues from the "space occupied by each item" (Krueger, 1972; Piaget, 1968). In this regard, consumer behavior researchers have confirmed that the quantity of products perceived by consumers is related to the space in which the products are placed; when products occupy more space, consumers perceive the whole set as a high quantity (Allik and Tuulmets, 1991; Vos et al., 1988). This implies that the shape of the box is closely related to consumers' perception of perceived quantity.

So, how does box shape affect consumers' perception of volume? Piaget (1968) showed that the height of the box is the most important variable for perception of the volume of the box; people use the height of the box as a heuristic clue for volume measurement. In a follow-up study, Holmberg (1975) revealed that the ratio of height to width greatly influenced people's perception of volume (Holmberg, 1975; Piaget, Inhelder, and Szeminska, 1960). In this way, the box shape can affect consumers' perceived consumption. For example, Raghubir and Krishna (1999) empirically observed that when the height of a box is greater, consumers' perceived consumption is lower. To be more specific, consumers' perceived consumption is lower when the ratio of height to width is greater, whereas their perceived consumption is higher when the ratio of height to width is smaller. In this regard, this research aims to explain consumers' perception of large-capacity products through the viewpoint of information-processing fluency, in which quantity recognition is based on the product's composition and volume recognition is according to the box's shape.

In the following sections, we develop our hypotheses about whether box shapes can influence product evaluations and purchase intentions and how product components can moderate this effect. Moreover, we attempted to verify the psychological mechanism behind this effect. We conducted two online experiments to test our hypotheses. In Study 1, we confirmed that participants favor single cereal products when the height of box is greater than the width of box. However, they prefer mixed cereal products when the box has a width greater than its height. In Study 2, we demonstrated that the same effects occurred in a different product category (i.e., snacks) including the height–width ratio. Furthermore, we found that information-processing fluency mediates the moderating effects of box shape and product components on consumers' target evaluations. Finally, we discuss the theoretical contributions and practical implications for global traders.

2. Theoretical Background

2.1. Recognizing Quantity Depending on Diverse Components

The definition of quantity is the amount that can be measured or counted, and the large or small amount is closely related to the number of units (e.g., the total capacity, in grams, of the contents in a bag of snacks). In general, people recognize the quantity of the product in the

form of adding the number of products with the same weight (Pelham, Sumarta, and Myaskovsky, 1994). Therefore, the large and small amount of quantity recognized by consumers is closely related to the number of products.

Consumers use cognitive resources to assess the quantity of products. For example, Kaufman et al. (1949) confirmed through experiments that the maximum number of products a person can recognize is six, and people can accurately measure the weight of a product up to six units. In addition, Mandler and Shebo (1982) found that consumers can count while utilizing cognitive resources, but the larger the number, the more time it takes to process. Moreover, people tend to process quantity information using heuristics. For example, Dehaene (1992) showed that when consumers counted products' quantities, they tended to process information using approximations of measures (e.g., brightness and weight) related to quantity as clues. Furthermore, the measurement time to count quantity using these heuristics is about 100–200 milliseconds, and the information is almost automatically processed (Mandler and Shebo, 1982). Moreover, Piazza et al. (2004) demonstrated that when consumers do not make cognitive efforts, they rarely perceive differences in quantity.

In contrast, when processing quantity information, consumers tend to actively use clues regarding the space occupied by each product (Allik and Tuulmets, 1991; Vos et al., 1988). For example, Piaget (1968) indicated that young children perceive a larger quantity of toys when a toy cube is bigger and showed that they recognize a large quantity of candy when candy boxes occupy more space. In other words, people perceive that the quantity of product is greater when the product occupies more space. Furthermore, Krishna and Ragbubir (1997) found that people recognize a larger product quantity for a single item (e.g., black dot) because they perceive that the target product occupies more space. However, when mixed items (e.g., black dots and white dots) were presented, people judged the target product's quantity as smaller. Overall, the quantity of products perceived by consumers is related to the perceived sense of space used, which depends on product components.

2.2. Volume Recognition Depending on Box Shape

In a volume perception study, Piaget (1968) demonstrated that when people judge volume, they mainly use the height of a container as a clue to determine its volume. Particularly, people tended to perceive that volume was reduced by pouring the same amount of solution into a taller cup to wider cup (Piaget, 1968; Piaget, Inhelder, and Szeminska, 1960). Through these experimental results, Piaget confirmed that people determine the volume (a three-dimensional variable) by using a height cue (a one-dimensional variable) and named it the centration hypothesis. Holmberg (1975) developed Piaget's research and argued for the elongation hypothesis through experiments using cylinders, which means that height as well as width also affect the perception of volume. In other words, the clue that people perceive the size of the volume is the height–width ratio of the container. Follow-up studies have also been conducted to support these hypotheses; Been, Braunstein, and Piazza (1964) empirically demonstrated that when the height of a cylinder decreases, people perceive the volume of the cylinder as decreasing more than when the width is decreased.

2.3. The Relationship Between Perceived Consumption Changed by Box Shape and Ease of Information Processing

Raghubir and Krishna (1999) showed that the height of a container serves as a heuristic for

consumers' perception of its volume. In addition, they confirmed that consumers' perceived consumption is inversely proportional to the height of the container and found that the lowered perceived consumption leads to an increase in actual consumption. Then, if the height of the longer container lowers consumers' perceived consumption, they will feel increased ease of information processing because the relatively large quantity is consistent with their expectations.

Information-processing fluency can be defined as the degree of ease with which people process information (Janiszewski and Meyvis, 2001; Lee and Aaker, 2004; Thompson and Hamilton, 2006). For example, Novemsky et al. (2007) defined cases where ideas related to certain information easily come to mind and related memories are easily accessed as a state of high information-processing ease. Information-processing ease can be strengthened through learning effects (Schwarz and Xu, 2011). Specifically, when people have a high degree of alignment between their experiences and newly introduced information, they feel that processing information about the target is easier (Lee and Labroo, 2004).

Information-processing ease can have a great influence on product evaluations as well as on evaluations of other people. For example, Sherif and Hovland (1961) revealed that when people meet others who align with their own experiences and expectations, they feel information-processing ease and think positively about the other; otherwise, they view this other negatively. In addition, Myers-Levy and Sternthal (1993) showed that for familiar products, target products are positively evaluated because information processing feels easy, but products that are unfamiliar are negatively rated because it is difficult to process the information.

Then, how will box shape and diverse product components affect consumers' product evaluations? As discussed above, the consumers' perceived consumption will be reduced with a greater box height (Krishna and Raghubir, 1997; Raghubir and Krishna, 1999). In this case, consumers will perceive that the large quantity of products in the box is natural. Therefore, the single product configuration, which seems to have a large quantity, conforms to the experience and expectations of consumers. This makes the information processing easier for consumers, which results in a positive evaluation of the product. In contrast, when the width of box is longer, consumers have an easier time processing information regarding products composed of various elements because their perceived consumption is greater. Therefore, we established the following hypotheses:

H1a: When the height of a box is greater than its width, products with single components will induce positive consumer target evaluations.

H1b: When the width of box is greater than its height, products with various components will induce positive consumer target evaluations.

H2a: When the height of a box is greater than its width, products with single components will induce positive consumer target evaluations through consumers' ease of information processing.

H2b: When the width of box is greater than its height, products with various components will induce positive consumer target evaluations through consumers' ease of information processing.

3. Study 1

The purpose of Study 1 was to test hypothesis 1, which posits that when the height of a box is greater than its width, a single product leads to a positive evaluation from consumers but that the opposite is true when the width of box is greater than its height.

3.1. Method

3.1.1. Participants and Design

The participants, 184 in number and of U.S. nationality (M_{age} = 40.76) were recruited through Amazon Mechanical Turk. In addition, 98 of participants were male and 86 were female. They were paid $0.50 each as compensation for participating in the Study. Participants were randomly assigned to one of four treatment conditions in a 2(box shape: height greater than width vs. height less than width) x 2(components: single vs. variety) between-subjects design.

3.1.2. Procedure and Measurements

Participants in the experiment were asked to read a virtual scenario of purchasing cereal online. We selected Kellogg's cereal because Kellogg's is the number one product in the U.S. cereal market, and, therefore, the moderating effects of the box shape and product components on U.S. consumers' product evaluations and their purchase intentions could be more effectively examined.

Kellogg's Frosted Flakes were used for the single-product condition, and Corn Pops, Raisin Bran, Rice Krispies, and Froot Loops were used for product variety. These products were presented as images to the participants in a box with either a greater height than its width or a greater width than its height (Appendix 1).

Next, participants were asked to rate their evaluations of the snack package. Participants evaluated the target product on four 7-point bipolar items: Unappealing–Appealing, Unfavorable–Favorable, Bad–Good, and Negative–Positive (Park Se-Bum and Park Do-Hyung, 2013; α = .94). Then, participants indicated their purchase intention toward the target product. Three 7-point Likert scales were used to measure purchase intentions: (a) "I would like to try the snack package," (b) "I would like to get the benefits from the snack package," and (c) "I am interested in purchasing the package." (1 = strongly disagree and 7 = strongly agree; α = .94). Next, participants completed the manipulation check by using a single 7-point Likert scale for box shapes ("I think the height of this box is longer than the width") and product components ("I think there are many package components"; 1 = strongly disagree and 7 = strongly agree). Last, participants answered questions regarding their demographic information.

3.2. Results

3.2.1. Manipulation Checks

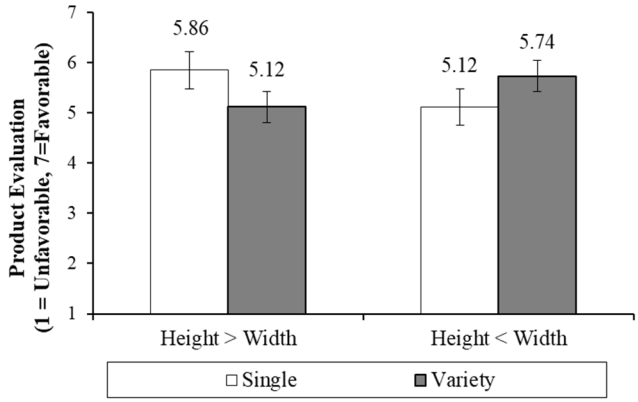
A 2(box shape) by 2(product components) analysis of variance (ANOVA) showed that there was a significant difference between the box shapes ($M_{height > width}$ = 5.78 vs. $M_{height < width}$ = 4.56; $F(1, 180) = 27.83$; $p < .001$). Moreover, the analysis indicated that participants regarded mixed products (M = 5.50) as more varied than single products (M = 4.70; $F(1, 180) = 12.09$; $p < .001$).

3.2.2. Product Evaluations and Purchase Intentions

To test our hypothesis, we conducted a 2(box shape) x 2(product components) ANOVA on product evaluation. As shown in Figure 1, the analysis showed that the interaction between box shape and product components influences product evaluation ($F(1, 180) = 10.42$; $p < .001$). Specifically, simple effect analysis demonstrated that participants gave more positive evaluations for single products when the box had a greater height than its width ($M_{single} = 5.86$ vs. $M_{variety} = 5.12$; $F(1, 180) = 12.35$; $p < .05$). However, when the box's width was greater than its height, participants evaluated a variety of products ($M = 5.74$) more positively than single products ($M = 5.12$; $F(1, 180) = 4.37$; $p < .05$).

These results occurred in the context of participants' purchase intentions for the target product. A 2(box shape) x 2(product components) ANOVA on the purchase intention revealed significant interaction effects ($F(1, 180) = 9.45$; $p < .01$). To be more specific, participants' purchase intentions were higher for single products when the height of box was longer than its width ($M_{single} = 5.57$ vs. $M_{variety} = 4.92$; $F(1, 180) = 4.35$; $p < .05$). However, when the width of a box was longer than its height, participants appeared to have higher purchase intentions for mixed products ($M_{single} = 4.85$ vs. $M_{variety} = 5.62$; $F(1, 180) = 6.13$; $p < .05$).

Fig. 1. Product evaluation as a function of box shape and product components (Study 1)



3.3. Discussion

The results of Study 1 demonstrated that participants favored single products when the height of box was longer than the width of box. However, when the width of box was longer than the height of box, participants evaluated a variety of products more positively. This suggests that the shape of the box and the type of components can have a great influence on the product evaluation of U.S. consumers.

4. Study 2

The aim of Study 2 was twofold. First, we intended to test whether the ease of information processing mediates the interaction effects of box shape and product components on consumers' product evaluations and purchase intentions. Second, we aimed to confirm

whether this effect appears in equal magnitude in other product categories and various box shape ratios to increase external validity.

4.1. Method

4.1.1. Participants and Design

In this study, there were 205 participants of U.S. nationality (M_{age} = 43.11) who were recruited through Amazon Mechanical Turk. Moreover, 99 of them were male and 106 were female. They were paid $0.50 each as compensation for participating in the Study. The participants were randomly assigned to one of four treatment conditions in a 2(box shape: height greater than width vs. height less than width) x 2(components: single vs. variety) between-subjects design.

4.1.2. Procedure and Measurements

First, participants in the experiment were asked to read the virtual scenario of the situation of purchasing snacks online. We chose Lays' products because Lays is the number 1 product in the U.S potato chips market.

Salt-and-vinegar-flavored products were used for the single item, and salt-and-vinegar, classic, barbeque, sour-cream-and-onion, and cheddar-and-sour-cream flavored products were used as mixed items. Like in Study 1, these products were presented as images to the participants in a box that had a greater height than width or greater width than height. In this case, a different ratio of boxes from the ratio of boxes used in Study 1 was used (Appendix 2).

The four 7-point Likert scale items were used to measure on the ease of processing information of the participant such that (a) "It was easy for me to evaluate this snack package," (b) "I didn't concentrate a lot while evaluating this snack package," (c) "I didn't take a lot of time to evaluate this snack package," and (d) "I didn't pay much attention while evaluating this snack package." (1 = strongly disagree, 7 = strongly agree; α = .79). Other measurements were the same as those in Study 1.

4.2. Results

4.2.1. Manipulation Checks

A 2(box shape) x 2(product components) ANOVA revealed a significant difference between the box shapes ($M_{height > width}$ = 5.72 vs. $M_{height < width}$ = 4.69; $F(1, 201) = 27.83$; $p < .001$). Moreover, the analysis indicated that participants regard mixed products (M = 5.40) as more varied than single product (M = 4.88; $F(1, 201) = 6.54$; $p < .01$).

4.2.2. Product Evaluations and Purchase Intentions

To test our hypothesis, we conducted a 2 (box shape) x 2 (product components) ANOVA on the product evaluation. The analysis demonstrated the significant effects of the interaction between box shape and product components on product evaluations ($F(1, 201) = 7.69$; $p < .01$). To be more specific, simple effect analysis revealed that participants gave higher evaluations of single products when the box height was greater than its width (M_{single} = 5.93 vs. $M_{variety}$ = 5.55; $F(1, 201) = 3.84$; $p < .05$). However, when the width of box was greater than the height, participants evaluated a variety of products more positively (M_{single} = 5.67 vs. $M_{variety}$ = 6.07; $F(1, 201) = 3.85$; $p < .05$).

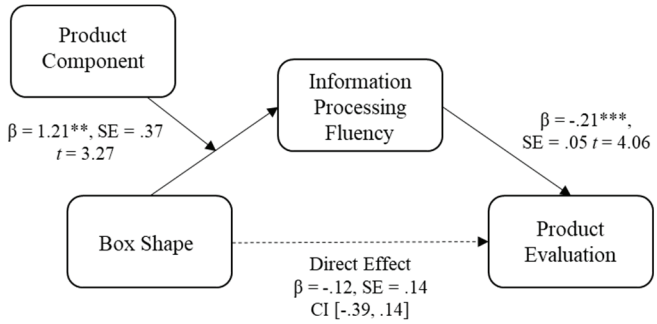
These results reflected participants' purchase intentions about the target product. A2 (box shape) x 2(product components) ANOVA on the purchase intention revealed significant interaction effects ($F(1, 201) = 10.38$; $p < .001$). Specifically, participants' purchase intentions were high for a single product when the height of the box was greater than its width ($M_{single} = 5.88$ vs. $M_{variety} = 5.37$; $F(1, 201) = 5.43$; $p < .05$). However, when the width of box was longer than its height, participants appeared to have higher purchase intentions for mixed products ($M_{single} = 5.35$ vs. $M_{variety} = 5.86$; $F(1, 201) = 4.97$; $p < .05$).

4.2.3. Moderated Mediation

To test the hypothesis, we conducted the same ANOVA on information-processing fluency. The analysis revealed a significant interaction between box shape and product components ($F(1, 201) = 10.67$, $p < .001$). Next, I ran a moderated mediation analysis (Hayes, 2017; Model 7, 5,000 bootstrap samples) to further examine whether information-processing fluency mediated the significant effects of the interaction between box shape and product components on the product evaluation and purchase intentions.

As Figure 2 shows, the moderated mediation was significant (β = .25, 95% CI = [.0770 .4863]), indicating that the information-processing fluency mediated the box shape x components impact on the product evaluation for the single product (β = .12, 95% CI = [.0081, .2556]) and mixed products (β = -.13, 95% CI = [-.2868, -.0200]). Moreover, the same results replicated participants' purchase intentions about the target product (β = .25, 95% CI = [.0770 .4863]). showing that the information-processing fluency mediated the box shape x components influence on the purchase intention for the single product (β = .11, 95% CI = [.0083, .2718]) and mixed products (β = -.13, 95% CI = [-.2964, -.0146]). Consistent with our hypothesis, the easy of processing information mediates the moderating effects of box shapes and diversity components on product evaluation and purchase intention.

Fig. 2. Moderated Mediation (Study 2).



Note: $^{**}p < 0.1$, $^{***}p < 0.001$.

4.3. Discussion

Through Study 2, we confirmed the effect of box shape and component diversity on consumer product evaluation and purchase intentions. Compared to Study 1, Lays were used as a stimulus, and the ratio of the boxes were more extremely presented. Particularly, external validity was secured by confirming that the interaction effects between box shapes and

product component appear to be the same among not only various product categories but also a variety of box proportions. Additionally, we found that the psychological mechanism for generating this effect is consumers' perceived ease of information processing

5. Summary and Conclusions

With the recent spread of COVID-19, U.S. consumers' consumption patterns have changed to a greater preference for online purchases and preference for large-capacity products. Therefore, this study examined the impact of box shapes and product compositions on product evaluations and purchase intentions in large-capacity packages and the underlying psychology in online purchase situations.

To be more specific, through Study 1, we confirmed that U.S. consumers prefer boxes with greater heights than widths to contain single products, whereas they prefer mixed product compositions when the width of the box is greater than the height of the box. Additionally, through Study 2, we showed that this effect appears in various product categories and found that the same effect occurs even when the height–width ratio varies. Particularly, U.S. consumers perceive decreased consumption with long boxes, so they felt increased ease of information processing with a single-product composition that they perceived as being high in quantity. However, U.S. consumers' recognition of high perceived consumption with wide boxes confirmed that they felt increased information-processing ease for mixed product components that were perceived as having a lower quantity and that such ease of information processing affects product evaluations and purchase intentions.

5.1. Theoretical Implications

This research has the following theoretical implications. First, this research expanded the theoretical scalability of the hypotheses by introducing the moderating variable of product components to the effect of the elongation hypothesis on consumer product evaluation. In other words, this suggests that when considering the effect of the box-shape ratio on consumers' target evaluations, its product composition diversity should also be considered. Second, this research has theoretical implications in that it examined the effect of box shape and product composition diversity on consumer product evaluation from the perspective of information-processing theory. This research explains the results through the cognitive resources of participants in terms of ease of processing fluency.

5.2. Practical Implications

This research has the following practical implications. When marketing practitioners launch large-capacity package products in the market, they can induce consumers to choose their products by adjusting the shape of packaging boxes according to the type of product composition. For example, when selling large-capacity cereals favored by U.S. consumers, it is advantageous to launch them in taller boxes for one flavor of large-capacity cereals, but for large-capacity cereals with various flavors, selling them in wider boxes will lead to more purchases from U.S. consumers. In addition, the results of this study will be insightful to local retailers for visual merchandising and display placement. In places such as supermarkets, there are often spatial constraints. In these cases, retailers will be able to efficiently deploy

their products by making effective use of these limited space. For instance, depending on the product, they can efficiently place some of the boxes with numerous components on the narrow vertical side of the cupboards, while placing the others with single component on the wide vertical side.

5.3. Limitations and Future Research

However, this research has the following limitations. First, this research only used product with hedonic properties as experimental stimuli. Considering the fact that consumer's decision-making process varies depending on the hedonic and utilitarian benefits provided by the product, it is necessary to check whether utilitarian products show the same results as this study. Second, this research does not consider the cultural background of consumers. This is because we selected only Americans as participants in the experiment. As many previous studies have shown that purchasing behavior varies depending on the cultural background of countries, it is necessary to consider these variables in subsequent studies. Lastly, the present research has a limitation in that the data was collected only online. Even though M-tuck data is commonly used in many consumer behavior studies, field data using real box would further enrichen the study, as the study deals with the moderating effect of box-shaped ratio and component diversity.

For future research, it will need to first identify the product component characteristics and their effects. For example, it is recommended to divide package components into hedonic and utilitarian and to observe how consumers' evaluations change accordingly. we adopted five types of mixed products in the experiments. However, if more products are used, the researchers should check whether the same effect occurs. Finally, it is also necessary to check how the box-shape effect varies for consumers when various clues (e.g., calorie information and certification marks) are attached to the product packages.

References

Allik, J. and T. Tuulmets (1991), "Occupancy Model of Perceived Numerosity". *Perception & Psychophysics*, 49(4), 303-314.

Been, R. T., M. L. Braunstein, and M. H. Piazza (1964), "Judgment of Volume Reduction in Distorted Metal Containers", *Journal of Engineering Psychology*, 3(1), 23-27.

Danelle, K. (2021, June 9), "NielsenIQ Beverage Alcohol Update for the Week Ending 5/29/21", Advisor Wine Industry Network. Available from http://wineindustryadvisor.com (accessed June 9, 2021)

Dehaene, S. (1992), "Varieties of Numerical Abilities", *Cognition*, 44(1-2), 1-42.

Hayes, A. F. (2017), *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. NY: Guilford Publications.

Holmberg, L. (1975), "The Influence of Elongation on the Perception of Volume of Geometrically Simple Objects", *Psychological Research Bulletin*, 15, 1-18

Janiszewski, C. and T. Meyvis (2001), "Effects of Brand Logo Complexity, Repetition, and Spacing on Processing Fluency and Judgment", *Journal of Consumer Research*, 28(1), 18-32.

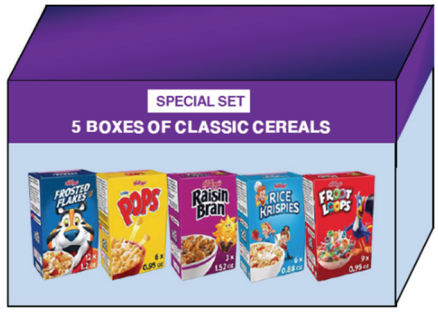
Kaufman, E. L., M. W. Lord, T. W. Reese and J. Volkmann (1949), "The Discrimination of Visual Number", *The American Journal of Psychology*, 62(4), 498-525.

Krishna, A. and P. Raghubir (1997), "The Effect of Line Configuration on Perceived Numerosity of Dotted Lines", *Memory & Cognition*, 25(4), 492-507.

Krueger, L. E. (1972), "Perceived Numerosity", *Perception & Psychophysics*, 11(1), 5-9.
Lee, A. Y. and J. L. Aaker (2004), "Bringing the Frame into Focus: The Influence of Regulatory Fit on Processing Fluency and Persuasion", *Journal of Personality and Social Psychology*, 86(2), 205-218.
Lee, A. Y. and A. A. Labroo (2004), "The Effect of Conceptual and Perceptual Fluency on Brand Evaluation", *Journal of Marketing Research*, 41(2), 151-165.
Mandler, G. and B. J. Shebo (1982), "Subitizing: An Analysis of Its Component Processes", *Journal of Experimental Psychology: General*, 111(1), 1-22.
Meyers-Levy, J. and B. Sternthal (1993), "A Two-Factor Explanation of Assimilation and Contrast Effects", *Journal of Marketing Research*, 30(3), 359-368.
Novemsky, N., R. Dhar, N. Schwarz and I. Simonson (2007), "Preference Fluency in Choice", *Journal of Marketing Research*, 44(3), 347-356.
Park, Se-Bum and Park, Do-Hyung (2013), "The Effect of Low-versus High-Variance in Product Reviews on Product Evaluation", *Psychology & Marketing*, 30(7), 543-554.
Pelham, B. W., T. T. Sumarta, & L. Myaskovsky (1994), "The Easy Path from Many to Much: The Numerosity Heuristic", *Cognitive Psychology*, 26(2), 103-133.
Piaget, J. (1968), "Quantification, Conservation, and Nativism", *Science*, 162, 976–979.
Piaget, J., B. Inhelder and A. Szeminska (1960), *Childs Concept of Geometry*, NY: Basic Books.
Piazza, M., V. Izard, P. Pinel, D. Le Bihan and S. Dehaene (2004), Tuning Curves for Approximate Numerosity in the Human Intraparietal Sulcus", *Neuron*, 44(3), 547-555.
Raghubir, P. and A. Krishna (1999), "Vital Dimensions in Volume Perception: Can the Eye Fool the Stomach?", *Journal of Marketing Research*, 36(3), 313-326.
Redden, J. P., and S. J. Hoch (2009), "The Presence of Variety Reduces Perceived Quantity", *Journal of Consumer Research*, 36(3), 406-417.
Schwarz, N., and J. Xu (2011), "Why Don't We Learn from Poor Choices? The Consistency of Expectation, Choice, and Memory Clouds the Lessons of Experience", *Journal of Consumer Psychology*, 21(2), 142-145.
Sherif, M. and C. I. Hovland, (1961), *Social Judgment: Assimilation and Contrast Effects in Communication and Attitude Change*, CT: Yale University Press.
Thompson, D. V. and R. W. Hamilton (2006), "The Effects of Information Processing Mode on Consumers' Responses to Comparative Advertising", *Journal of Consumer Research*, 32(4), 530-540.
Vos, P. G., M. P. Van Oeffelen, H. J. Tibosch and J. Allik (1988), "Interactions Between Area and Numerosity", *Psychological Research*, 50(3), 148-154.

Appendices

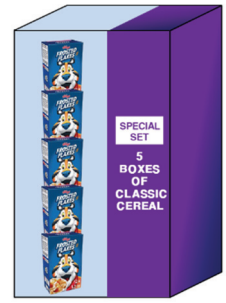
Appendix 1. Stimuli used in Study 1.



Height < Width & Variety Condition

Height > Width & Variety Condition

Height < Width & Single Condition



Height > Width & Single Condition

Appendix 2. Stimuli used in Study 2

Height < Width & Variety Condition

Height > Width & Variety Condition

Height < Width & Single Condition

Height > Width & Single Condition