The Value-Weight Illusion: Can Value Bias Weight Estimates?

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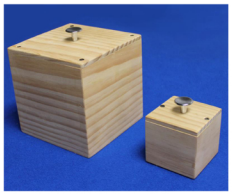
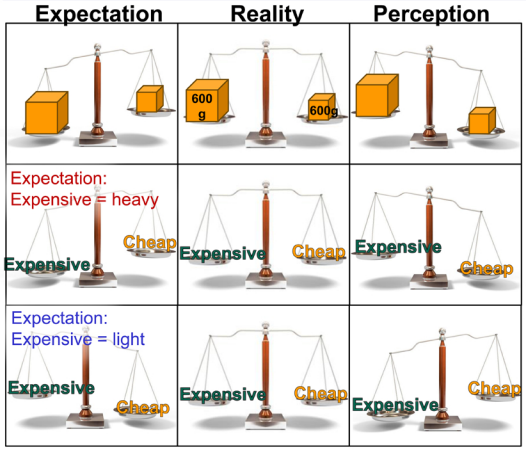
Introduction

The Size-Weight Illusion and the Value-Weight Illusion



In the SWI, the assumption is that bigger objects are heavier than smaller ones. Therefore, **when lifting two *equally weighted* objects, the smaller object will be judged as** heavier than the larger. Might it also be the case that interacting with equally-sized, equally weighted objects of different monetary value biases weight perception? If valuable things are expected to be heavy, then does a valuable thing feel lighter than a cheap thing of the same weight? What about the opposite?

Experimental Hypotheses



Classic: Size-Weight Illusion

New: Value-Weight Illusion

Materials

Vase	Height (cm)	Original Weight (g)	Volume (mL)	Mean Weight Estimate (SD)	Mean Price Estimate (SD)
Flower	26	875	1495	1280 g (300)	$37.71 (20.46)
Fish	24.5	1173	2251	1120 g (267)	$34.67 (20.34)
Metallic	24.6	1343	2812.5	1019 g (252)	$33.26 (18.35)
Green	25.5	1220	1126	1029 g (270)	$31.48 (19.52)
Striped	25.8	1031	2000	1080 g (255)	$33.09 (16.81)

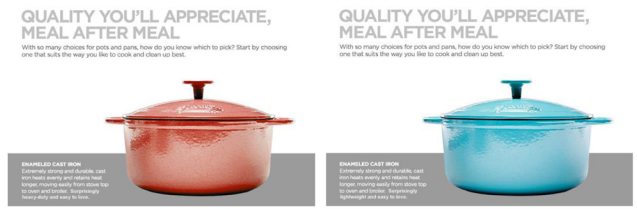
Stimuli. 5 decorative vases filled with fishing weights wrapped in foam until the **weights were 1350 g ± 5 g.** Height and volume of all 5 vases was consistent Vase shapes were also similar. Color/style varied, but all were glazed clay/ porcelain and opaque.

Weight References. Participants trained to make weight estimates by lifting 4 boxes of identical shape and size (167 cm x 95 cm x 115 cm) with weight clearly labeled.
Box Weights: 300 g, 600 g, 1200 g & 2400 g

Study 1: Methods and Results

N = 49 (11 males, mean ± SD age: 19.11 ± 1.6 years, rage 18-28)

1. Prime Value/Weight Relationship with Modified Ads

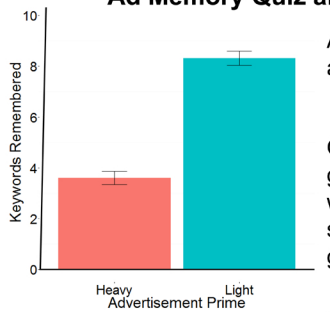


"Extremely strong and durable, cast iron heats evenly and retains heat longer, moving easily from stove top to oven and broiler. Surprising ***heavy-duty/lightweight*** and easy to love."

2. Vase Aesthetics Questionnaire

Presented with each vase in randomized order and asked to respond to 10 questions about each vase. For example, "How much do you like the color? (1 = very much, 5 = not at all)," or **"How much (in dollars) do you think this vase would cost?"** Participants were also asked to **estimate the weight of each vase in grams** (see *Materials*).

3. Prime Manipulation Check: Ad Memory Quiz and Weight/Price Results

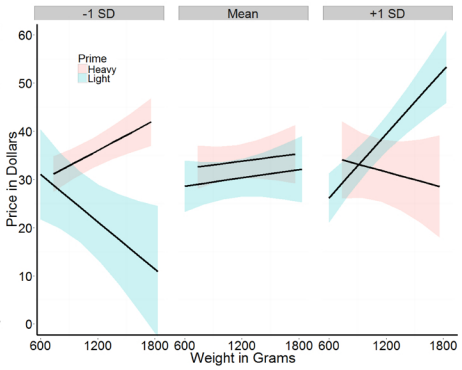


Assessed differences in number of advertisement keywords remembered.

Maximum memory score: 15

One-way ANOVA revealed significant group differences for memory scores, with the "heavy" group remembering significantly less words than the "light" group: $F(1,228) = 176.46$, $p < 0.001$.

Main effect of vase weight predicting vase price was significant: Wald chi-square(1) = 4.89, $p = 0.03$, as was the 3-way interaction between weight, prime condition, and memory score: Wald chi-square(1) = 6.47, $p = 0.011$. Plotted here is the relationship between vase weight and value at the mean and ±1 *SD* levels of memory.

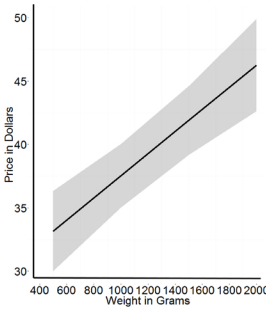


Study 2: Methods and Results

N = 58 (21 males, mean ± SD age: 19.21 ± 0.9 years, rage 18-22).

The relationship between value and weight is flexible:

- **Valuable hardwood furniture weighs more** than cheap veneer furniture
- New laptops weigh less than older models—**lighter laptops** are **more valuable**



This study examined how participants perceive the relationship between vase value and weight *in the absence of priming.*

Conclusion

When participants remember the ***heavy-weight = high value prime***, their estimates of vase value decrease with their estimates of vase weight. The trend reverses at low memory levels. For participants with good memory of ***light-weight = high value prime***, heavier weight estimates are associated with higher value estimates.

Vases are the type of item where **higher value is typically associated with lower weight**. The more delicate and fine the china, the more valuable the vase and the less it will weigh. Thus when participants are not primed, their estimates of vase value and manipulated vase weight are consistent with the mindset that less valuable vases weigh more.

The results of both studies are consistent with the class of size-weight illusion-like relationships between weight and other features of objects. **When more value is expected to coincide with less weight, participants lifting vases that weigh equal amounts will overestimate the weight of the vases they believe are the most valuable** in a manner comparable to the overestimation of weight for small objects expected to be lighter than large objects in the size-weight illusion.

References

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