Worse Is Bad: Asymmetric Inferences on Items and Assortments From Logically Equivalent Comparisons

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When comparing products, the same relation can often be framed two different ways; A is better than B, or B is worse than A. Here we investigate how the framing of these relations affects judgments of the products in question, as well as other products in the same category/assortment.

[to cite]:

[url]:
http://www.acrwebsite.org/volumes/2412254/volumes/v46/NA-46

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Paper #1: Worse is Bad: Asymmetric Inferences on Items and Assortments From Logically Equivalent Comparisons
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Paper #2: When the Ends Do Not Justify Paying for the Means: Consumers Prefer Shifting Costs from Means to Goals
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Paper #3: How Does the Perceived Value of a Medium of Exchange Depend on its Set of Possible Uses?
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Paper #4: Dissociable Mechanisms for Evaluation Involved in Appraising a Set Versus Choosing From It
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SESSION OVERVIEW
We commonly find ourselves evaluating sets of options, such as when browsing retail displays, or purchasing bundled goods. Similarly, when buying gift cards, memberships, and/or vouchers, we consider the individual and joint benefits of the options that they allow us to access. Interestingly, the perceived value of such sets rarely arises from simply summing the value of their components.

Instead, prior findings suggest that the value of a set of options with comparable attributes reflects the average value of the individual items (Gaeth et al. 1991; Brough and Chernev 2011; Chernev and Gal 2010). However, not all options may contribute equally – a preferred target or item that receives initial consideration can have disproportionate influence on a set’s net value (Yadav 1994; Shenhav and Buckner 2014). Furthermore, a cohesive relationship between items can create a unique superseding value for them when considered collectively as a set (Evers, Inbar and Zeelenberg 2013.)

The papers in this session examine how the value of individual options can relate to or interact with the value of a set based on inter-item relationships, set meanings and overarching decision goals. To start, Evers and Inbar consider how the values of individual items in a bundle are established in relation to each other. They find that a framing of “Option A is better than Option B” versus “Option B is worse than Option A” impacts not only the individual values of the options, but also the value of the bundle.

Shaddy and Fishbach consider bundles of options that serve distinct roles such as goals (e.g., ordering a gift) and means (e.g., paying for delivery), and find that people prefer shifting costs to goals and away from means. As a result, valuation of items within these bundles can reverse depending on the item’s perceived role. Furthermore, consumers see more value in a goal item (e.g. a book), compared to a goal-means bundle (e.g., a book and delivery), meaning that they can be willing to pay more for less.

Spiller and Ariely similarly demonstrate ways in which adding options to a set can decrease its perceived value. They consider evaluations for a medium for exchange such as a gift card that can be applied to specific types of goods. They find that a medium for exchange that is designated for use on a single (preferred) good can be seen as more valuable than one that can be used on the preferred good as well as other categories.

Finally, Karmarkar and Shenhav examine the mechanisms involved in evaluating a set as a whole (appraisal) versus evaluating a set as a group of choice options (choice). Consistent with prior findings, they show that a set’s appraisal value correlates most significantly with the average value of its component items. This overall set value is represented in neural activity during both appraisal and choice tasks. However, choice recruits additional areas of brain activity, possibly reflecting the comparative value of options within the set. Their findings suggest separable task-dependent mechanisms underlying set vs. option evaluations.

Worse is Bad: Asymmetric Inferences on Items and Assortments From Logically Equivalent Comparisons

EXTENDED ABSTRACT
When evaluating products, we usually compare these products to other products in the reference category (see for example, Tversky & Kahneman, 1981). The same relation between products in a bundle or category can usually be framed in two different ways; A is better than B, or B is worse than A. In this project we look at how these two different ways of framing affects quality inferences about the products under consideration as well as other products within the reference-category.

Based on work investigating the “leakage of information” (Sher & McKenzie, 2006), we expect that beyond the actual information in a description, consumers also draw inferences from the speaker’s choice of frame. But what information do they infer, and how does this affect the consumer’s judgment and choices about the focal products and the rest of the assortment? A simple prediction is that when “toaster A is better than toaster B”, consumers infer that toaster A is must be really good. When “toaster B is worse than toaster A” consumers may infer that toaster B is really bad. Alternatively, instead of merely inferring the quality of A and B, consumers may infer different quality for the entire set of toasters. When A > B, all toasters must be pretty good, when B < A all toasters must be pretty bad.

In 8 studies, we consistently find an asymmetric pattern of inferences both for the focal products (A and B) as well for the entire assortment. Compared to an assortment where product A is described as being better than product B, consumers who see that B is worse than A infer only slightly lower quality for A, but infer a much lower quality for B. For example, in Study 1 (N = 313), participants evaluated toasters in the top-10 toaster list from Consumer Reports. They read in the review that toaster A (JC Penny) is better than toaster B (KitchenAid), or that toaster B is worse than toaster A. Judgements for toaster A were slightly worse in “B is worse than A” (M = 2.87, on a 7-point scale) as compared to “A is better than B” (M = 3.32, p = 0.03), but were much more pronounced for toaster B (M, lower = 0.43, M, upper = 1.27, p < .01). We replicate these findings in Study 2 using different products.

We find similarly asymmetric inferences being drawn about the rest of the assortment. More specifically, between the different kinds of framing, participants do not infer that the quality of the average and top products in the assortment differ in quality, however we find stark differences in inferred quality for products in the lower range of the assortment. For example, in Study 5 (N = 400), participants are asked to evaluate engineering teams. They read that their assistant has made a list of the ten teams available and read that either “team A is better than team B” or that “team B is worse than team A. Particip-
pants then judged the quality of Team A, Team B, but also the best, the average and the worst team. We replicate the previous effects with a small difference in judgments of team A ($M_{\text{better}} = 3.3, M_{\text{worse}} = 2.8, p < .01$) and a larger difference for team B ($M_{\text{better}} = -0.1, M_{\text{worse}} = -1.45, p < .001$). More importantly, we find a similar pattern of inferences for other objects in the category with no differences in the judgments of the best team ($M_{\text{better}} = 4.25$ vs $M_{\text{worse}} = 4.27$), nor the average team ($M_{\text{better}} = 1.78$ vs $M_{\text{worse}} = 2.06$), but find strong differences in the quality judgments of the worst teams ($M_{\text{better}} = -0.25$ vs $M_{\text{worse}} = -0.95$). We replicate this finding in a different domain in Study 7 ($N = 400$), and using different measures (percentile scores rather than subjective judgments) in Study 7 ($N = 400$).

Beyond mere inferences, we also measure the downstream consequences on choice, both for the focal objects (A and B) as well as the rest of the set. In Studies 1 and 2, where product A and B are both in the top-10, we find that participants are more likely to buy an item ranked 11-25 rather than product B (which is in the top 10) when product B is described as worse than product A ($68/156$) as compared to when A is described as better than B ($32/157$), $p < .001$. We find similar effects for choice for the non-focal objects in the assortments. For example, in Study 8 ($N = 400$), we give participants the opportunity to buy several unusual flavors of jellybeans. These participants are shown 5 different flavors of jellybeans ranked by average liking. Half of these participants read that “Orange crush” (#2) is judged to be better than “Jewel bubble gum” (#4), the other half of participants read that “Jewel bubble gum” is worse than “Orange crush”. Then for each of the 5 flavors, participants can decide to buy a sample for $0.25, or not buy. As in the quality judgments, we find no differences in the proportion choosing to buy the top ranked jellybeans (#1$_{\text{worse}} = 88\%$, #1$_{\text{better}} = 85\%$; #2$_{\text{better}} = 83\%$, #2$_{\text{worse}} = 74\%$), but a more substantial difference in the lower end of the distribution (#4$_{\text{better}} = 35\%$, #4$_{\text{worse}} = 23\%$; #5$_{\text{better}} = 45\%$, #5$_{\text{worse}} = 22\%$).

To summarize, we investigate how the framing of products within a category as “A is better than B” vs. “B is worse than A” affects inferences about the focal products (A & B) as well as the rest of the assortment. We find consistent asymmetric inferences such that the framing only weakly affects judgments of the higher end products in the assortment, but strongly affects judgments of the lower end of the range. These inferences affect subsequent choices, such that consumers avoid products in the lower range more when the focal products are described as “B is worse than A” as compared to “A is better than B”.

**When the Ends Do Not Justify Paying for the Means: Consumers Prefer Shifting Costs from Means to Goals**

**EXTENDED ABSTRACT**

Many consumption episodes conform to a goal-means structure (Etkin and Ratner 2012; Fishbach and Dhar 2005; Pieters, Baumgartner, and Allen 1995). Someone wishing to order a gift (a goal), for example, may also need to pay for shipping (the means). We investigate how the hierarchical configuration of goal systems affects preferences for resource investment in these goal-means “bundles.”

Specifically, we propose that consumers are more willing to invest resources in goals than in means. Consequently, within a goal-means bundle, consumers will both pay more for the item perceived to be the goal (vs. the item perceived to be the means) and pay more for only the goal (vs. a means that is bundled with the goal). Consumers will also prefer to pay sooner for goals (vs. means), choose to use marketing promotions to reduce costs associated with means (vs. goals), and are happier when costs associated with means (vs. goals) are eliminated by such promotions.

We explain that this preference persists because in the architecture of goal systems, goals sit atop the hierarchy. Thus, investing resources in goals is perceived as direct investment in goal attainment (i.e., higher in the goal hierarchy), while investing resources in means is perceived as indirect investment (i.e., lower in the goal hierarchy). We argue that people prefer direct investment. Critically, this distinction between direct and indirect resource investment is a novel feature of our account and important because previous research has explored the allocation of resources horizontally (i.e., between various means; Kruglanski et al., 2002), but not vertically (i.e., between means and goals).

In Study 1 we manipulated, for a pair of products, which item was perceived as the goal and which item was perceived as the means. We elicited actual WTP (Vickrey 1961) for both chef’s knife and a cutting board. In the knife condition, we framed a cutting board as a means for the goal of using a chef’s knife; in the board condition, we framed a chef’s knife as a means for the goal of using a cutting board. In the knife condition, participants expressed greater WTP for the chef’s knife ($M = 17.17, 95\% C.I. = [15.38, 18.96]$) than for the cutting board ($M = 14.43, 95\% C.I. = [12.72, 16.14]$; $F(1, 408) = 29.98, p < .001$). In the board condition, however, the pattern reversed. Participants expressed greater WTP for the cutting board ($M = 16.81, 95\% C.I. = [14.96, 18.67]$) than for the chef’s knife ($M = 14.04, 95\% C.I. = [12.24, 15.83]$; $F(1, 408) = 28.15, p < .001$).

One implication of our theory is that because people are more willing to invest resources in goals than in means, it is possible that they will express greater WTP for only a goal, compared to a means that is bundled with the goal. In Study 2, MBA students submitted bids for either a book autographed by Richard Thaler (i.e., paying for the goal) or for a tote bag in which the same autographed book would be delivered (i.e., paying for a means bundled with the goal). WTP for just the book ($M = 23.38, 95\% C.I. = [17.24, 29.51]$) exceeded WTP for the tote bag bundled with the book ($M = 12.18, 95\% C.I. = [7.06, 17.31]$; $t(79) = 2.84, p = .006$).

In Studies 3–4, we presented participants with one of three scenarios, each of which presented a goal-means “bundle.” Participants imagined that they needed to either take a prerequisite class (means) before a target class (goal), run a qualifying marathon (means) before running the Boston Marathon (goal), or cook a practice meal (means) before cooking a dinner party meal (goal). When paying for each goal and each means, participants both expressed greater desire to eliminate costs associated with means ($F(1, 298) = 36.58, p < .001$) and were happier when costs associated with means were eliminated ($F(1, 299) = 12.91, p < .001$).

In Study 5, we presented participants with items that either formed a goal-means bundle (i.e., a tote bag served as a means to acquire beach towels) or would be purchased for two different people and hence, served as unrelated goals. When given the opportunity to delay payment for each (thereby reducing costs through temporal discounting), participants preferred delaying payment for the tote bag only when it was part of a goal-means bundle ($F(1, 197) = 9.50, p = .002$).

Finally, in Studies 6–7 we measured nonmonetary forms of resource investment to offer process evidence for our account and eliminate pricing norms as an alternative explanation.

In Study 6 we presented participants with two news articles and manipulated whether the articles maintained a goal-means relationship (i.e., an article about the opioid epidemic served as the means by which participants could achieve the goal of understanding an article about falling life expectancy) or represented separate goals. In the goal-means condition, participants spent more time reading the
article presented as a goal than the article presented as a means (F(1, 215) = 3.99, p = .047). This pattern disappeared when both articles were perceived as goals (F(1, 215) = 21.99, p < .001).

In Study 7 we predicted that the perception of direct (rather than indirect) investment in goal attainment would mediate the effect. We framed either dieting or exercising as a means for achieving the goal of exercising or dieting and exercising as separate goals. In the goal-means condition, participants were willing to spend more time planning their exercise regimen than their diet regimen (F(1, 223) = 21.01, p < .001). This pattern disappeared when both were perceived as goals (F(1, 223) = 6.19, p = .014). Moreover, this effect was fully mediated by the extent to which participants perceived exercise to be a more direct investment in goal attainment (indirect effect = .168, SE = .09, 95% C.I. = [.030, .373]).

In short, our results suggest that consumers systematically prefer shifting costs from means to goals. Thus, while the ends may justify the means, the ends may not always justify paying for the means.

How Does the Perceived Value of a Medium of Exchange Depend on its Set of Possible Uses?

EXTENDED ABSTRACT

A medium of exchange is valuable because it may be exchanged for something else that directly or indirectly provides value. Money, gift cards, concert tickets, and arcade tokens are all media of exchange that are valuable because they eventually enable consumption of something else. The normative value of a medium of exchange is based on the best set of goods and services for which it can be exchanged. Formally, the normative value of a medium of exchange is the difference between the expected utility of the best bundle of goods that can be obtained with that medium and the expected utility of the best bundle of goods that can be obtained without that medium.

Previous work on the value of media of exchange has focused on the medium itself, independent of its uses. One stream of literature has focused on how the numerosness of a currency and its nominal value influence its perceived value: Holding constant real prices and wages, people are sensitive to nominal prices and wages (Fisher 1928/2011; Shafir, Diamond, and Tversky 1997), the presence of an irrelevant medium changes consumer behavior (Hsee et al. 2003; Lynch 1979).

In contrast, we ask the basic question of how the perceived value of a medium is grounded in its potential uses. We propose the value of a medium of exchange should be a function of the sum of the components of the set. In contrast, the value of a set of potential purchases relevant for a medium of exchange should depend on the maximum of the components of the set, not the sum. Whether this same averaging principle extends to such a “max-set” in addition to “sum-sets” remains an open question. If the averaging principles does extend to medium of exchange’s max-sets, such integration across irrelevant potential uses of a set would imply that adding less-desirable uses could decrease evaluations.

Findings from research on assortments lends suggestive support to this proposal, though whether it applies to the perceived value of media of exchange remains to be tested. The evaluation of a set of products decreases as the number of unacceptable products in the assortment increases (Kahn and Lehmann 1991) and decreasing the number of undesirable products available can increase evaluations when category salience is held constant (Broniarczyk, Hoyer, and McAlister 1998). These effects are particularly pronounced when people make direct evaluations of the set as a whole rather than actively thinking through all the stages of the decision and deriving an evaluation based on the underlying choice (Sood, Rottenstreich, and Brenner 2004).

Studies 1A–1D. In our first set of studies, we examine how including a less-attractive option reduces choice of a medium of exchange. Participants (total N = 603) were less likely to choose a medium of exchange that could be used on either of two goods than they were to choose a medium of exchange that could only be used on the more-attractive good (ps < .01). The magnitude of the effect increased with the difference in value between the more- and less-attractive goods (bigger differences led to bigger effects).

Studies 2A–2E. In our second set of studies, we examine perceived value as operationalized via willingness to pay. We also varied the salience of the value of the component goods and the choice between the component goods. Across studies (total N = 1300), we again find that media of exchange are valued less when usable on two goods than just the more-attractive good (ps < .005). The manipulations of value and choice had no consistent effects but together indicate that choice aversion, nor comparative loss aversion, nor non-consequential reasoning, nor category averaging fully accounts for the overall devaluation.

Using both measures of choice and willingness to pay, we find that adding a less-attractive alternative decreases the perceived value of the medium of exchange. These findings hint that comparing apples and oranges may not be as difficult as idioms lead us to believe; what is difficult is comparing two apples to a dollar that can be exchanged for any one of a nearly countless set of products.

Dissociable Mechanisms for Evaluation Involved in Appraising a Set Versus Choosing From It.

EXTENDED ABSTRACT

People commonly encounter arrays of options that can be as varied as those in a bakery case, a course catalog or a car dealer’s lot. In these situations, there are two possible modes of engaging with such sets: “just browsing” the set (appraisal), versus making a choice from it. These modes intuitively seem to be distinguishable phenomena, but it’s less clear if they represent distinct processes and/or types of value.

Separate lines of research have shown specific mechanisms associated with appraising the value of individual stimuli/goods (Knutson et al., 2007; Plassmann et al., 2007; Lebreton et al., 2009), and with the process of choosing (Levy and Glimcher, 2012; Bartra et
al., 2013; Clithero and Rangel, 2013). However, that work does not establish whether the overall set value can be extrapolated from the value(s) of its individual options. It also remains unclear to what degree the mechanisms involved in appraising a set of options overlap those involved in choosing from that set of options.

Here we examine these questions by using behavioral tasks combined with functional magnetic resonance imaging (fMRI). We scanned participants while they were actively directed to appraise (e.g. report their liking for) sets of four items, or choose their preferred item from such sets. Importantly, both tasks required participants to consider the same kind of sets, and the value of each item in the set, but differed in terms of whether they require a composite of those values or a comparison between them.

For this experiment, a group of 30 individuals first rated their liking for each of a large number of consumer products. Based on these ratings, we constructed individualized four item sets of low-, medium-, and high-value options. We also created mixed-value sets by randomly sampling four products from across the participant’s entire value distribution (without replacement). In the main fMRI task, participants were shown one of these sets on each trial, and were asked to either make a Like (e.g. appraisal) decision by rating their value for the set as a whole, or make a Choose decision, by indicating which of the items they preferred most. Each set was seen only once in this part of the experiment, but after exiting the scanner, participants engaged in a counterbalanced version of the task, so that we had both appraisal and choice ratings for all of the sets.

The first question was how the appraisal value of the set related to the individual option values. Preference for the set could be driven by the value of the best item in the set, the average value of items in the set, or some combination thereof. When regressing set liking on both of these variables, we found that it was most strongly associated with the average option value ($\beta=0.59, t(26.0)=10.1, p<0.001$). The value of the best item in the set exerted a non-significant positive influence on set liking ($t(25.6)=1.7, p=0.10$).

This finding is convergent with prior studies on bundle values (Gaeth et al. 1990; Brough and Chernev 2011; Chernev and Gal 2010), but divergent from work involving choices from two-item sets (Shenhav and Buckner, 2014). This raises the issue of whether participants recognized that the set represented a grouping of possible choice options. Thus in a separate behavioral experiment, participants (N=300) were randomly assigned to one of three conditions related to evaluating a set of four bags of snack chips. One condition asked participants: Assuming that you are planning to buy one of these bags, how much do you like this display, or set of options, as a whole? The second condition asked “How much do you like this display, or set of options, as a whole?” The final condition replicated the framing of the fMRI task; participants were first informed that they might be asked to appraise the set or choose from it, and then were given the appraisal task. After rating the set, participants rated the individual snack bag options. There were no differences in liking ratings for the set ($F(2,297)=.306, p=.736$) across these conditions, and across conditions, each person’s liking for the set was once again significantly predicted by the average of their ratings for the four snack bags separately ($\beta=.589, p<0.001$).

To study neural activity associated with set value during the Like and Choose tasks, the following analyses use a set of a priori regions of interest related to set preference and choice from functional results in Shenhav and Buckner, 2014. For completeness, we also performed a whole-brain analysis (thus avoiding assumptions about the specific areas involved) and observe similar results and distinctions to those reported here.

In line with prior work, neural activity in a Dorsal Value Network (DVN; ventral striatum, posterior cingulate cortex, and pregenual anterior cingulate cortex) increased parametrically with ratings of set liking during the Like task ($\beta=0.09, t(25.6)=3.3, p=0.003$). Importantly, activity in the DVN also increased parametrically with ratings of set liking when participants were evaluating that set for the Choose task ($\beta=0.08, t(26.5)=2.5, p=0.020$). Thus the set’s appraisal value, best related to the average liking for each of the set options, was similarly represented in the brain regardless of task goal.

In contrast, activity in a differing set of brain regions that could be considered a Ventral Value Network (VVN, medial orbitofrontal cortex, retrosplenial cortex, and left middle frontal gyrus), was substantially greater for Choose relative to Like trials ($\beta=0.36, t(27.2) = 7.1, p<0.001$). Indeed we observed a network-by-task interaction demonstrating that the relative difference in activity for Choose versus Like was significantly greater in the VVN ($F(1,65.7)=25.0, p<0.001$).

Our findings indicate that when we encounter sets of items, we encode their value as the average value of the items that compose the set. In addition, the results suggest that there are differentiable task-specific mechanisms involved in estimating value when we are appraising a set of possible options versus considering and comparing the individual value of items within a set.

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