The Effect of Primed Reference Points on the Shape of Attribute-Value Functions, Attribute Importance, and Choice

Koert van Ittersum, Georgia Institute of Technology, USA
Joost M.E. Pennings, Maastricht University, The Netherlands

EXTENDED ABSTRACT

Introduction

One of the challenges of effective product positioning is to increase the importance of those attributes on which the product performs better than the competition and to decrease the importance of those attributes on which the product performs less than the competition. It is therefore imperative for marketers to comprehend the importance of attributes in judgment and choice (Van Ittersum et al. 2007; Wansink and Van Ittersum 2004). The importance of attributes in judgment and choice is driven by decision-makers' attribute-value functions. Attribute-value functions reflect the idiosyncratic valuation of an attribute at different attribute levels, relative to decision makers' reference points (Tversky and Kahneman 1991). Decision makers' reference dependence, loss aversion, and diminishing sensitivity determine the shape of value functions. As decision makers rely on their attribute-value functions in judgment and choice, the shape of value functions influences the importance of attributes in judgment, and choice (Van Ittersum and Pennings 2007; Van Ittersum et al. 2004). This research examines if, when, and how priming (internal and external) reference points influences the shape of attribute-value functions and as a result the importance of attributes in judgment, and choice.

Priming decision makers' *internal reference points*, reference points stored in decision makers' memory, prior to a judgment task is hypothesized to stimulate them to incorporate their internal reference points when constructing their attribute-value functions, triggering decision makers' reference dependence and feelings of loss aversion (Vaughan 1928). Accordingly, we hypothesize to find more *concave*, *convex*, and *S-shaped* (versus linear) value functions for *primed* decision makers prior to the judgment and choice task than for *unprimed* decision makers. With decision makers relying on their attribute-value functions in judgment, we further hypothesize that the primed reference points influence the importance of attributes in judgment, and choice.

Next, we propose that priming *external reference points*, reference points provided by external stimuli in a judgment and choice task, such that decision makers experience gains (losses) stimulates the construction of concave (convex) value functions. With decision makers relying on their attribute-value functions in judgment tasks, and convex functions being steeper than concave functions, the importance of an attribute among decision makers with primed external reference points representing a loss-prime is higher than the importance of an attribute among decision makers with primed external reference points representing a gain-prime. The choice likelihood of a product performing more favorable on an attribute with an external reference point representing a loss-prime is higher than that of a product performing more favorable on the same attribute with an external reference point representing a gain-prime.

These effects of priming are proposed to be moderated by the extent to which decision makers' attribute-value functions are well-defined, and will be stronger for decision makers with undefined value functions (Carlson and Bond 2006).

An Empirical Study

To examine our hypotheses, we took a within-subject design approach by priming 201 participants' internal and external reference points in two lab studies. In Study 1, the effects of priming internal reference points were examined for computers (attributes: price, working-memory size (Mb)). In Study 2, the effects of priming external reference points were investigated for cars (attributes: price, fuel efficiency (mpg)).

To establish the *shape of participants' attribute-value functions*, participants rated each product on ten levels of each of the two attributes. To estimate the shape of the value functions, the EXP-IPT technique is applied (Pennings and Smidts 2003). This technique fits the attribute-level valuations for each participant to both the negative exponential function (concavity/convexity) and the log of the inverse power transformation function (S-shape). Based on a pairwise comparison of the Mean Squared Error, the value functions were classified as either concave/convex or S-shaped.

To determine the *importance of attributes in judgment* in both studies, a full factorial judgment task (2^4 profiles) was employed. The importance of attributes was calculated by establishing the maximum difference in valuations for an attribute across all attribute levels related to product profiles and dividing it by the sum of the maximum differences of all attributes in the stimulus set. To study the effects of priming on *choice*, participants were asked to make a choice: Study 1 computer 1 ($500, 256 Mb), or computer 2 ($2,000, 1,024 Mb); Study 2: car 1 ($2,500, 9.5 mpg), or car 2 ($8,500, 30.5 mpg). To differentiate between participants with well-defined and undefined value functions, we use participants' knowledge about the product as a proxy for their experience with the relevant attributes and attribute levels (Hoeffler and Ariely 1999) (1=I do not know a lot about [*product*], 9=I know a lot about [*product*]).

To *prime internal reference points*, we stimulated half of the participants to write down the price and the size of the working memory of the computer they work most on prior to the different judgment tasks.

To examine the effects of priming external reference points, participants were randomly assigned to either the $-loss/mpg-gain or the $-gain/mpg-loss prime condition. In the $-loss/mpg-gain ($-gain/mpg-loss prime) condition, participants were informed that "the majority of college students purchase cars with an average price of $2,500 ($8,500) that drives an average of 9.5 mpg (30.5 mpg)."

Conclusions

We find that priming *internal* reference points influences the shapes of attribute-value functions for decision makers with undefined value functions. Priming their internal reference points stimulates reference dependence and feelings of loss aversion in the value-function construction process. Consequently, more decision makers with concave, S-shaped, and convex attribute-value functions are found among the primed decision makers than among unprimed decision makers. When decision makers' internal reference points are not primed, they are more likely to construe linear attribute-value functions, particularly decision makers with undefined value functions. The effects of priming on the shape of attribute-value functions for decision makers with undefined value functions changes the importance of attributes, and choice.

Priming *external* reference points as gains (losses) also influences the shape of attribute-value functions, but only among decision makers with undefined value functions. Priming external

reference points as gains (losses) increases the likelihood that decision makers exhibit concave (convex) value functions. This effect of primed external reference points has a corresponding effect on the importance of attributes in judgment, and choice.

References

Carlson, Kurt A. and Lisa K. Pearo (2004), "Limiting Predecisional Distortion by Prior Valuation of Attribute Components," *Organizational Behavior and Human Decision Processes*, *94* (1), 48-59.

Carlson, Kurt A. and Samuel D. Bond (2006), "Improving Preference Assessment: Limiting the Effect of Context through Pre-exposure to Attribute Levels," *Management Science*, *52* (3), 410-421.

Dhar, Ravi and Klaus Wertenbroch (2000), "Consumer Choice between Hedonic and Utilitarian Goods," *Journal of Marketing Research*, *37* (February), 60-71.

Dholakia, Utpal M. and Itamar Simonson (2005), "The Effect of Explicit Reference Points on Consumer Choice and Online Bidding Behavior," *Marketing Science*, *24* (Spring), 206-217.

Fischer, Gregory W. (1995), "Range Sensitivity of Attribute Weights in Multiattribute Value Models," *Organizational Behavior and Human Decision Processes, 62*, 252-266.

Grewal, Dhruv, Kent B. Monroe, and R. Krishnan (1998), "The Effects of Price-comparison Advertising on Buyers' Perceptions of Acquisition Value, Transaction Value, and Behavioral Intentions," *Journal of Marketing*, *62* (April), 46-59.

Helson, Harry (1964), *Adaptation Level Theory*. New York: Harper & Row Publishers, Inc.

Hoeffler, Steve and Dan Ariely (1999), "Constructing Stable Preferences: A Look Into Dimensions of Experience and Their Impact on Preference Stability,"*Journal of Consumer Psychology*, *8* (2), 113-139.

Kivetz, Ran, Oded Netzer, and V. Srinivasan (2004), "Alternative Models for Capturing the Compromise Effect," *Journal of Marketing Research*, *41* (August), 237-257.

Kumar, V., Kiran Karande, and Werner J. Reinartz (1998), "The Impact of Internal and External Reference Prices on Brand Choice: The Moderating Role of Contextual Variables," *Journal of Retailing*, *74* (3), 401-426.

Mazumdar, Tridib and Kent B. Monroe (1990), "The Effect of Buyers' Intentions to Learn Price Information and Price Encoding," *Journal of Retailing*, *66* (1), 15-32.

Payne, John W., Jim R. Bettman, and Eric J. Johnson (1993), *The Adaptive Decision Maker*. Cambridge: Cambridge University Press.

Pennings, Joost M.E. and Ale Smidts (2003), "The Shape of Utility Functions and Organizational Behavior," *Management Science*, *49* (9), 1251-1263.

Plott, Charles (1996), "Rational Individual Behavior in Markets and Social Choice Processes," in *The Rational Foundations of Economic Behavior*. Arrow, K.J., Colombatto, E., Perlman, M., Schmidt, C. eds. Macmillan, London: and St. Martin Press, New York, 225-250.

Tversky, Amos and Daniel Kahneman (1991), "Loss Aversion in Riskless Choice: A Reference-Dependent Model," *The Quarterly Journal of Economics*, *106* (4), 1039-1061.

Van Ittersum, Koert, and Joost M.E. Pennings (2007), "Attribute-Value Functions and the Importance of Attributes," *Advances in Consumer Research*, 34, 627.

Van Ittersum, Koert, Joost M.E. Pennings, Brian Wansink, and Hans C.M. Van Trijp (2007), "The Validity of Attribute-Importance Measurement: A Review." *Journal of Business Research*, 60 (11), 1177-1190.

Van Ittersum, Koert, Joost M.E. Pennings, Brian Wansink, and Hans C.M. Van Trijp (2004), "Improving Attribute-Importance Measurement; A Reference-Point Approach," *Advances in Consumer Research*, 31, 84-85.

Vaughan, Floyd L. (1928), *Marketing and Advertising*. Princeton: Princeton University Press 123.

Wansink, Brian, and Koert van Ittersum (2004), "Stopping Decisions of Travelers," *Tourism Management*, 25, 319-330.

West, Patricia M., Christina L. Brown, and Steve J. Hoch (1996), "Consumption Vocabulary and Preference Formation," *Journal of Consumer Research*, *23* (September), 120-135.