

What factors affect the valuation of reward objects?

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ABSTRACT

This study investigates what factors affect the value received from rewarding performance with non-monetary objects. Prior research has shown that displays of competence are needed to increase the value of such objects. This study adds to the literature by investigating whether arousal, gender and attributions of skill also affect the value. Findings include that arousal, competence and gender are important factors, whereas attributions of skill is not significant.

Keywords: Achievement, arousal, competence, motivation, reward objects.

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INTRODUCTION

Reward objects are commonly used to motivate employees and students to perform better (Jeffrey and Shaffer, 2007). Survey evidence shows 67% of firms use non-cash incentives for non-sales personnel (Incentive Federation 2003). However, the benefits received from the reward object can be diluted if the object has less value to the individual. This study investigates several factors which can affect the value that individuals place on these reward objects in hopes of informing on better ways to use reward objects for a motivational purpose.

This study contributes to the literature by identifying several key variables which affect the value individuals place on reward objects. Findings include that competence, arousal and gender each affect the value an individual places on a reward object, whereas self-attributions of skill does not. The study also investigates whether there is an interactive effect of these variables and does not find evidence to support any interactions.

This paper has broader implications for motivating individuals within organizations. Although most economists assume that money is a more effective motivator than reward objects (e.g., Baker, Jensen & Murphy, 1988), it is demonstrated that competence, arousal and gender explain and predict when a reward object is valued more than the monetary equivalent. Another implication is that organizations can stimulate value by creating arousing situations such as awards ceremonies and by helping people to internalize attributions of competence.

LITERATURE AND HYPOTHESES

In this study, the focus is on how several factors affect the value of reward objects for individuals. Value in the experiment is measured as the price individuals place on the object in exchange for the object itself. This is also known in the literature as 'willingness-to-accept' (Loewenstein & Issacharoff 1994).¹ The focus is on the object as the source of value. The value can be influenced by the manner in which it is obtained, the belief of the worthiness of the individual obtaining it, and other factors that are static, like gender. Several of these factors are investigated in this study.

Loewenstein & Issacharoff (1994) discuss the concept of 'source dependence' on the value individuals place on reward objects. In their experiments, participants who felt that they earned the reward object due to exemplary performance on a task (exhibiting competence in the task) valued it more highly than those who earned the reward object due to poor performance on the task. This study replicates the test of Loewenstein & Issacharoff (1994) and expands on it by adding in several alternate and/or additional explanatory variables to see if their result holds.

H1: Competence affects the valuation of reward objects.

Arousal is defined as immediate superficial processing triggered by an antecedent event (Russell, 2003). Research investigates arousal in the context of sex, drugs, and medical treatments. However, no evidence was found in the literature of studying arousal in an achievement context. Therefore, arousal is studied to determine if it affects valuation.

Links between arousal and competence are discussed in the literature (Schachter, 1962; Weiner, 1985; Russell, 2003). The arousal-cognition model (Schachter, 1962; Weiner, 1985;

¹ This differs from 'willingness-to-pay' (another measure of value used in the literature) in that each of our subjects was endowed with the reward object prior to eliciting the price, so they didn't need to obtain the object, only to decide on a price at which to sell the object. Therefore, the endowment effect (the difference in willingness-to-pay and willingness-to-accept, Kahneman et al. 1990) is not being investigated in this paper.

Russell 2003) supports the expectation that people process information when they are aroused but not otherwise. This model predicts that a stimulating event, such as an exciting reward object, is necessary to trigger higher valuation of reward objects. Importantly, however, arousal was not directly measured or controlled in many of these competence studies (Heath & Traversky 1991, Taylor 1995). This study tests whether arousal has an effect on the valuation of reward objects.

H2: Arousal affects the valuation of reward objects.

Several previous studies find that women are more prone to emotion than men (for a review see Nolen-Hoeksema & Rusting, 1999). This higher display of emotion can translate to a higher value being placed on a reward object (Bokemeier and Lacy, 1987). While gender has been controlled for in many studies by selecting reward objects that are thought to be gender-neutral, gender still plays a role in the results. Here, this study tests explicitly whether gender is an explanatory variable in the valuation of a reward object.

H3: Gender affects the valuation of reward objects.

Finally, attribution of skill could possibly affect the value one places on a reward object. People tend to view positive results as a manifestation of their own skill, while negative results are attributed to luck, something outside the control of the individual (Weiner 1985). The result of this is that people may attach more value to an object if the person thought more skill was involved than if more luck was involved.

H4: Attributions of skill affects the valuation of reward objects.

Therefore, the following model is tested:

$$\text{Price} = \alpha + \beta_1 \text{Arousal} + \beta_2 \text{Gender} + \beta_3 \text{SA Skill} + \beta_4 \text{Quiz Score} + \varepsilon$$

METHOD

Participants and design

Subjects were 94 junior- and senior-level undergraduate accounting students at a large state university (44 men and 50 women). In the study, price is the dependent variable. Price is elicited from the subjects as the willingness to accept amount for their reward object. Arousal, one of the independent variables, is measured as a dichotomous variable; *i.e.*, subjects experienced either moderate or high arousal. Moderate—instead of low—arousal is anticipated because eliciting price required endowing all subjects with stimulating reward objects. Gender and self-attributions of skill were the remaining independent variables. The means of measuring the variables are described in the following paragraphs.

Procedure

Prospective subjects were informed that in exchange for participating in the study they would receive a prize or an unspecified amount of cash. The experimental procedure took approximately 25 minutes to complete. First, the quiz was administered, consisting of 15 definitions each followed by an objectively correct and an incorrect word. (The quiz appears in the Appendix.) The subjects were to choose the correct word for each definition based on the textbook. Individuals graded their own quiz and then passed their quiz to a partner who checked the score. Quizzes were returned with a mug. Subjects then completed instruments allowing the experimenters to capture the dependent and independent variables.

Price (ranging from \$0.00 to \$15.00, in \$0.25 increments) was the dependent variable. Price was elicited from all subjects. All subjects received a reward object, the previously described coffee mug. The reward object would retail for \$5.95 based on a search of comparable mugs. The experimenters elicited each subject's price to sell their mugs with the following instructions, adapted from Loewenstein & Issacharoff (1994, 160):

“You now have the opportunity to trade your mug for some money. Below are a series of lines marked: ‘keep mug_____. Trade it for \$ amount_____.’ Please mark ‘keep mug _____’ for each \$ amount where you would prefer to keep the mug instead of trading it for the \$ amount that is listed. Please circle “Trade it for \$ amount_____” for the first amount at which you would rather have cash than the mug.

We have predetermined a maximum “buyback price” for the mugs. The amount is written on a slip of paper in the envelope. When everyone has completed their questionnaires, the amount will be revealed. If the \$ amount you circled is less than or equal to the amount we reveal then you will give up the mug and we will give you the \$ amount you circled in cash. If the \$ amount you circled is greater than the amount we reveal then you will keep the mug. Note that it is in your interest to indicate what the mug is truly worth to you. All trades will take place immediately.”

After subjects indicated their price, the experimenters revealed the predetermined amount of money to exchange (\$4.75). Subjects who chose a price that was less than or equal to \$4.75 exchanged their mug for the amount they specified in cash. Individuals who set a price over \$4.75 kept their mug.

Arousal was manipulated following a real world achievement context described by Peters & Waterman (1982, 123) using the presence or absence of loud stimulating music, applause, flash photography, and high enthusiasm on the part of the people conducting the experiment. In the high arousal group, the experimenters and the class instructor set a high energy tone. In addition, loud, stimulating music was played (e.g., Queen's “We are the champions”) while each subject was called to the front of the class to receive his or her mug. A flash photograph was taken as each subject was presented with his or her mug. During this process everyone in the room was encouraged to clap and cheer (in fact, the clapping and cheering got so loud in the high arousal group that people in a neighboring classroom asked the experimenters to restrain the enthusiasm). This was in contrast to the moderate arousal group in which the class instructor set a low energy tone, no music was played, no flash photograph was taken, there was no clapping and cheering, and subjects received their mug while seated.

Gender was measured as an independent variable to determine whether it had an effect on price (value). An effort was made to keep the reward object gender-neutral to avoid an obvious gender effect. To do this a coffee mug was chosen as a gender neutral reward objects. A search of the literature found no reported evidence of gender effects in studies that endowed subjects with coffee mugs as the basis for eliciting willingness to accept (e.g., Kahneman, Knetsch, & Thaler, 1990; Loewenstein & Issacharoff, 1994; Van Boven, Dunning, & Loewenstein, 2000; Nayakankuppam & Himanshu, 2005). The mugs were designed to be attractive to the subjects in school colors with the words “Outstanding Accounting Student” screen-printed on each side in gold letters.

Finally, self-attribution of skill was measured (from “pure luck” to “pure skill” on a 10-point scale). The instrument appears in the Appendix.

RESULTS

Manipulation checks

The effect of the arousal manipulation was measured using Baron's (1987) arousal instrument with the following four questions, each on a ten-point scale: calm-tense, relaxed-on edge, sleepy-wide awake, and dull-alert. The results for these items are examined using a factor analysis and determined that the sleepy-wide awake and the dull-alert questions had Eigen values greater than 1 (together explaining 93% of the variance). Using a composite measure of arousal, constructed by weighting the two items by their factor scores, it was found that the arousal manipulation had a marginally significant effect on the composite arousal score ($F(1, 92) = 1.93$, $p = .08$). Considering that arousal is partly an unconscious phenomenon (Frijda, 1999; Russell, 2003) and that the self-report measures were designed to capture only the conscious part of this construct, the above results provide evidence that arousal was successfully manipulated.

One subject was dropped from the analysis because her mug had a small scratch. The subject called this defect to our attention and expressed her disappointment. Another subject was eliminated because she chose a willingness to accept of \$0.00 for her mug, which is interpreted as a protest vote (Loewenstein & Issacharoff 1994). Dropping these subjects did not qualitatively impact the results we report.

Descriptive statistics

Table 1 presents the descriptive statistics for the continuous variables. Price, the proxy for value and the dependent variable, has a mean of 6.55, indicating that the sample participants were willing to accept an average price of \$6.55 for their mugs. SA Skill (self-attributed skill) is an independent variable in this study. The participants could attribute their results to luck (0) or to their skill (0). As can be seen, the average response (5.11) was that the result was part luck, part skill. Finally, the quiz scores could range from 15 (all responses were correct) to 0 (none of the responses were correct). In the sample, the average score was 9 (60% correct). The range of the scores was quite large, with a low of 3 correct responses to a high of 13 correct.

Table 2 presents the correlation matrix. Price is significantly related to arousal and quiz score at the .01 level and to gender at the .05 level. The only other significant correlation is between SA Skill and Quiz score; indicating that the participants attributed more of their performance to skill as their quiz score increased.

Regression results

The model being tested is the following:

$$\text{Price} = \alpha + \beta_1 \text{Arousal} + \beta_2 \text{Gender} + \beta_3 \text{SA Skill} + \beta_4 \text{Quiz score} + \varepsilon$$

Table 3 tabulates the results from the regression. The model is significant overall ($p < .001$) with an adjusted $R^2 = 0.158$. The sample results indicate that when subjects are determining the extent to which they value a reward (price), the level of arousal, gender and actual performance (quiz score) significantly impact their valuation. In contrast to the expectation set by attribution theory, whether our subjects thought they earned the reward or received it through luck did not significantly affect the price they were willing to accept to relinquish the reward.

What factors affect

In untabulated results, all possible interactions among the independent variables were investigated. None of the interactions was statistically significant. A significant (at the 0.05 level) correlation was found between SA Skill and Quiz score. However, when collinearity diagnostics were run, the tolerance value was .890 indicating no multicollinearity problems (Menard, 1995).

CONCLUSION

This paper presents an experimental study designed to test whether arousal, gender, self-attributed skill and quiz score affect the “value” of a reward. The study finds that arousal, gender and quiz score significantly affected the price subjects were willing to accept for a reward they had received. An implication of these results is that to increase the effectiveness of rewards for achievement, in the class room or in the workplace, managers or teachers should provide feedback on performance (quiz score) and present the reward object in a public manner (arousal). For example, a student who received the top score on an exam, could be identified as having done so as the instructor returns the exams to the class. Similarly, the top salesperson for the quarter could be singled out at the monthly sales meeting. Organizations can increase the value of a reward object by creating arousing situations such as awards ceremonies and by helping people to internalize competence. This study indicates that high performance and high arousal increase the value of the reward to the person receiving it, with the effect more significant for women than men.

J B
S B

REFERENCES

- Baker, G. P., M. C. Jensen, & Murphy, K. J. (1988). Compensation and incentives: Practice vs. theory. *Journal of Finance*, 43, 593-616.
- Baron, R. A. (1987). Effects of negative ions on interpersonal attraction: evidence for intensification. *Journal of Personality and Social Psychology*, 52, 547-553.
- Bokemeier, J.L., & W.B. Lacy (1987). Job values, rewards, and work conditions as factors in job satisfaction among men and women. *The Sociological Quarterly*, Vol. 28, Issue 2, 189-204.
- Frijda, N. H. (1999). Emotions and hedonic experience. In D. Kahneman, E. Diener, & N. Schwarz, Editors, *Well-Being: The Foundations of Hedonic Psychology* (pp. 190-210). New York, NY: Russell Sage Foundation.
- Heath, C. & Tversky, A. (1991). Preference and belief: Ambiguity and competence in choice under uncertainty. *Journal of Risk and Uncertainty*, 4, 5-28.
- Incentive Federation. (2003). *A study conducted among current users of merchandise and travel items for motivation/incentive applications*. Westfield, NJ: Author.
- Jeffrey, S.A., & V. Shaffer (2007). The Motivational Properties of Intangible Incentives. *Compensation and Benefits Review*, May/June, 44-50.
- Kahneman, D., Knetsch, J. L., & R. Thaler, R. H. (1990). Experimental tests of the endowment effect and the Coase theorem. *Journal of Political Economy*, 98, 1325-1348.
- Loewenstein, G., & Issacharoff, S. (1994). Source dependence in the valuation of objects. *Journal of Behavioral Decision Making*, 7, 157-168.
- Menard, S. (1995). *Applied logistic regression analysis*. Sage University Paper Series on Quantitative Applications in the Social Sciences, 07-106. Thousand Oaks, CA: Sage.
- Nayakankuppam, D. & Himanshu., M. (2005). The endowment effect: Rose-tinted and dark glasses. *Journal of Consumer Research*, 32, 390-397.
- Nolen-Hoeksema, S. & Rusting, C. L. (1999). Gender differences in well-being. In D. Kahneman, E. Diener and N. Schwartz editors, *Well-Being: The Foundations of Hedonic Psychology* (pp. 330-352). New York, NY: Sage.
- Peters, T.J. & Waterman, R. H. (1982). *In Search of Excellence*. Warner Books.
- Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review*, 110, 145-172.
- Schachter, S. (1962). Cognitive, social, and psychological determinants of emotional state. *Psychological Review*, 69, 379-399.
- Taylor, K. A. (1995). Testing credit and blame attributions as explanation for choices under ambiguity. *Organizational Behavior and Human Decision Processes*, 64, 128-137.
- Van Boven, L., Dunning, D., & Loewenstein, G. (2000). Egocentric empathy gaps between owners and buyers: Misperceptions of the endowment effect. *Journal of Personality and Social Psychology*, 79, 66-76.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92, 4, 548-573.

Table 1
Descriptive statistics for the continuous variables

	Mean	Minimum	Maximum	N
Price	6.55	0.00	15.00	94
SA Skill	5.11	1.00	10.00	94
Quiz score	9.17	3.0	13.0	94

Table 2
Correlation matrix

	Price	Arousal	Gender	SA Skill	Quiz score
Price	1.0				
Arousal	.307**	1.0			
Gender	.214*	.017	1.0		
SA Skill	.067	-.036	-.138	1.0	
Quiz score	.282**	.075	-.030	.229*	1.0

** significant at the 0.01 level (2-tailed)

* significant at the 0.05 level (2 tailed)

Table 3
Regression Results

	β (unstandardized)	t – statistic	Significance
Constant (α)	-.693	-.340	.734
Arousal	2.501	2.913	.005
Gender	1.976	2.294	.024
SA Skill	0.99	0.469	.640
Quiz score	.479	2.300	.024

Appendix

Vocabulary Quiz

Circle the correct word to match the definition that follows.

- | | | | |
|-----|--------------------|-----------------|--|
| 1. | Accretion | Corporeal | Increase in economic worth through physical change. |
| 2. | Cooperativity | Superadditivity | Able to do at least as well acting together as acting separately. |
| 3. | Multicollinear | Stochastic | Involving chance or probability. |
| 4. | Enabling Costs | Free Costs | Costs that can be avoided if the capacity goes unused. |
| 5. | Walrasian | Pareto | A manner of allocating goods and services such that no participant can be made better off without worsening the condition of another participant. |
| 6. | Factoring | Hypothecation | The pledging of property, without transfer of title or possession, to secure a loan. |
| 7. | Disintermediation | Diversification | The process of investors moving funds to higher rates when the free-market rates are higher than the regulated interest ceiling for time deposits. |
| 8. | Solvent | Secure | Able to meet debts when due. |
| 9. | Keynesianism | Egalitarianism | A belief in human equality with regard to social, political, and economic rights. |
| 10. | Wash sale | Reinvestment | The sale and purchase of the same asset within a short period of time. |
| 11. | Heteroscedasticity | Multivariate | Unusual or unexplained variance. |
| 12. | Kiting | Lapping | The theft, by an employee, of cash sent in by a customer to discharge the latter's payable. |
| 13. | Abasement | Defalcation | Embezzlement |
| 14. | Encumbrance | Indexation | An anticipated expenditure, or funds withheld for such expenditure. |
| 15. | Holding Company | Conglomerate | A parent company with smaller companies having dissimilar lines of business. |

What factors affect

Please indicate your answer to each of the following questions:

1. My gender is: Female Male

2. My performance on the quiz was:

1	2	3	4	5	6	7	8	9	10
Pure Luck									Pure Skill

3. My performance on the quiz was explained by:

1	2	3	4	5	6	7	8	9	10
Quiz Difficulty									My Ability

4. My performance on the quiz was:

1	2	3	4	5	6	7	8	9	10
Not at all Surprising									Very Surprising

5. How do you feel?

1	2	3	4	5	6	7	8	9	10
Sleepy				J	B				Wide Awake

1	2	3	4	5	6	7	8	9	10
Dull				S	B				Alert

1	2	3	4	5	6	7	8	9	10
Calm				S	B				Tense

1	2	3	4	5	6	7	8	9	10
Relaxed									On Edge

6. My score on the quiz was (please circle your answer):

Low, 60% or less
 High, above 60%

Anything you would like to tell us: _____

What factors affect