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The Trophy Effect

by Christoph Bühren[✉] and Marco Pleßner*, University of Kassel

Abstract

By extending a typical endowment effect experiment with the possibility to win the endowment in a real effort contest, we found two enforcing effects that led to a complete market failure. Subjects who won the item in the competition had an extremely high willingness to accept (trophy effect). By contrast, subjects who were not successful had an extremely low willingness to pay for the same item (reverse trophy effect). We disentangle the different components of the trophy effect, compare it to similar experiments, and discuss its important economic implications.

1. Introduction

Imagine you play in a tennis tournament at your local club. As your opponents are of the same strength as you, playing the matches is hard work. Now imagine you have managed to win the tournament and the prize is a trophy which is sold for 5 € at a local shop. For how much are you willing to sell this trophy? How much might your opponents be willing to pay for this trophy?

If there is a big discrepancy between the first and second answer, we have found an example in which a market for this trophy is at least imperfect. In our paper, we will show that markets for “trophies” can completely fail. Thereby, we show that everyday market items can turn into such trophies. Further, we will separate different elements of the trophy effect, which is based on the well-known endowment effect (Thaler 1980).

The endowment effect is among the most robust phenomena in behavioral economics. Usually, the mean willingness to accept (WTA) for convenience goods exceeds the mean willingness to pay (WTP) by a factor of two (Irwin 1994, Tversky and Kahneman 1992). However, higher ratios can be observed, especially in field studies: e.g., exceeding fourteen in the case

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of basketball tickets (Carmon and Ariely 2000). A key question to ask is what determinants actually influence the size of the gap between WTA and WTP. Keeping income effects constant, Haneman (1991) showed that the fewer substitutes which are disposable for a good, the greater the difference between WTA and WTP. Zhang and Fischbach (2005) argued that such discrepancies are strongly affected by subjects' moods: They found that the gap between WTA and WTP diminishes under positive mood conditions and that it is amplified by negative moods. Moreover, people act more generously and take more chances when spending "other people's money", which leads to smaller WTA-WTP gaps in experimental settings (Cherry et al. 2005).

Apart from these determinants, there are copious factors that might also contribute to the feeling of being attached to an object, e.g., the result of labor. A lot of real effort experiments already exist: Fahr and Irlenbusch (2000) used it in trust games, Ball et al. (2001) for experimental auctions and Hofmann and Spitzer (1985) in experiments on cooperative game theory. However, until today the effect of earned endowment has primarily been tested in settings different from those used in the present study. For instance, Cherry et al. (2005) designed a real effort experiment to explore the effect of earned endowments on observed contributions to a public good. Participants had to earn money by taking part in a quiz containing 17 questions taken from the Graduate Management Admission Test (GMAT). Their results suggest that participants contributed about the same to the public good whether their endowments were earned or not, indicating that the origin of endowment has no significant effect. Hoffman et al. (1994) analyzed earned endowments in the dictator game and ultimatum game. They showed that participants who worked for their proposer position by achieving high test results in a general knowledge quiz behaved in a more self-regarding manner. Namely, they tried to take advantage of their first mover position by offering significantly less to the responder compared to subjects in standard settings. This means that earning one's position can lead to higher egoism in bargaining games.

The set-up used by Hoffman et al. (1994) served as an inspiration for the current study: In our experiment, subjects had to work in order to become endowed with an item. They had to strain themselves to get into a seller position. The experiment described in this study reveals significantly higher ownership utility for participants who had to work for the traded good. Specifically, subjects took part in a mathematics test. Those who attained better results than the median were endowed with a pen. Subsequently, they stated WTAs that were excessively high. We call this pattern the "trophy effect".

The trophy effect substantially exceeds the ordinary endowment effect exhibited in our control group. Therefore, sellers did not value their pens more than buyers merely due to the extra utility caused by being its owner. They seemed to incorporate the work and the feeling of being a winner of the difficult competition into the items. These factors lead to a large increase in their WTAs, making their “trophies” unsalable. The trophy effect is a new phenomenon with organizational and managerial implications that can be far-reaching.

Our findings can be compared to a recent study conducted by Norton et al. (2010), who suggested that labor “leads to love” for the object it is successfully performed on. When people design and construct products by themselves, they tend to overvalue their creations. Norton (2009) labeled this phenomenon the “IKEA effect”. The IKEA effect is closely related to the traditional endowment effect and the trophy effect. Norton and his coauthors asked their participants to fold origami and to bid on their own creations as well as on those of other participants. All subjects were willing to pay significantly more for their own work. Furthermore, they preferred their own creations to origami folded by experts. The biggest difference from the trophy effect is that the work in Norton’s IKEA effect is directly performed on the valued object itself, whereas the work to attain a trophy is usually accomplished in an unrelated competition.

The remainder of our paper is as follows: Section 2 describes the experimental settings that analyze the trophy effect. In section 3, we derive our hypotheses; section 4 describes the data and tests these hypotheses. In section 5 we call attention to the implications of the trophy effect, discuss our findings, and give an outlook for possible future research.

2. Experiment

The experiment was carried out as part of the master course (M.A. in Economics) “Quantitative methods of experimental economics” at the University of Kassel, Germany. It was conducted in the summer semesters of 2010 and 2011. Altogether, it involved 76 students, majoring in either economics or business administration, who had already taken part in one endowment effect experiment. Thus, they had market experience and knew how the market clearing price materialized.¹ Test subjects were made aware that all their pricing decisions

¹ The findings offered by List (2003) and Coursey et al. (1987) indicate that the endowment effect is eliminated with experience, suggesting that value disparities are an artifact of the lack of market experience. In our setting, the endowment effect and the even more intense trophy effect persist although all participants had taken part in market experiments before. Thus, the results of the present study take a similar line as Harbaugh et al. (2001), who ran a series of experimental tests on this topic with people, primarily children and students, in different age

were binding and that transactions would be realized with their own money in order to render the market settings as realistic as possible.

To clarify the different components of the trophy effect, we used four treatments: the baseline (or control) treatment that tests the ordinary endowment effect; our trophy treatment that tests the combined effect of work and winning; and two further control treatments that separately analyze the effect of winning and the effect of work on valuation.

Baseline Treatment

Our baseline-treatment design mainly resembles the one chosen by Kahneman et al. (1990). This control group consisted of 18 members. Buyers received a set of instructions on distributed forms (distinctions for sellers in parentheses).

In this market, the objects being traded are ball-point pens.² You do not own a pen, so you are a buyer. (You now own the pen in front of you, so you are a seller.) You purchase a pen in the case that the price which is determined later in the experiment is acceptable to you. (You sell your pen in the case that the price which is determined later in the experiment is acceptable to you.)

Please enter a price up to which you are willing to buy the pen in the field below. (Please enter a price from which you are willing to sell the pen in the field below.) It has to be between 0 and 5.0 € and should only have one decimal place. Possible prices are thus 0.1 € 0.2 € ... , 4.9 € 5.0 € The transactions will take place after the experiment. You can voluntarily explain your pricing decision on the back of the questionnaire.

Trophy Treatment

Students of the trophy treatment group (n=20) had to complete an elementary mathematics test within 15 minutes. It was brought to their attention that only the ten best students would be rewarded with a ball-point pen afterwards. After the test was given, the answers were collected and the ten best students were determined, all participants got the following instructions. Those who were rewarded with a pen became sellers, whereas students whose results were below the median got the chance to buy a pen. The forms for buyers were worded as follows (differences for sellers in parentheses):

groups. They found that even large increases in age – and therefore in market experience – do not reduce the endowment effect at all.

² The ball-point pens were available for 2.10 € at the nearby campus store.

In this market, the objects being traded are ball-point pens. You do not own a pen, so you are a buyer. (You have acquired the pen in front of you for your good results in the mathematics test, so you are a seller.) You purchase a pen in the case that the price which is determined later in the experiment is acceptable to you. (You sell your pen in the case that the price which is determined later in the experiment is acceptable to you.)

Please enter a price up to which you are willing to buy the pen in the field below. (Please enter a price from which you are willing to sell the pen in the field below.) It has to be between 0 and 5.0 € and should only have one decimal place. Possible prices are thus 0.1 €, 0.2 €, ... , 4.9 €, 5.0 €. The transactions will take place after the experiment. You can voluntarily explain your pricing decision on the back of the questionnaire.

Work Treatment

In this treatment (n=16), the group of sellers also had to solve a mathematics test within 15 minutes. In contrast to the trophy treatment, all presumptive sellers were remunerated with a pen for their efforts after the test, regardless of their results. Again, each buyer and seller received a form (instructions for sellers in parentheses):

In this market, the objects being traded are ball-point pens. You do not own a pen, so you are a buyer. (You now own the pen you worked for in the mathematics test, so you are a seller.) You purchase a pen in the case that the price which is determined later in the experiment is acceptable to you. (You sell your pen in the case that the price which is determined later in the experiment is acceptable to you.)

Please enter a price up to which you are willing to buy the pen in the field below. (Please enter a price from which you are willing to sell the pen in the field below.) It has to be between 0 and 5.0 € and should only have one decimal place. Possible prices are thus 0.1 €, 0.2 €, ... , 4.9 €, 5.0 €. The transactions will take place after the experiment. You can voluntarily explain your pricing decision on the back of the questionnaire.

Lottery Treatment

Another fraction of the participants (n=22) took part in an explicit lottery. They were told that they had a 50% chance of winning a ball-point pen by drawing a ticket. The winners were subsequently endowed with a pen and became sellers. The other half assumed the role of buy-

ers in this market. After the winners were determined and the items were handed over, buyers and sellers received the following forms (instructions for sellers in parentheses):

In this market the objects being traded are ball-point pens. You do not own a pen, so you are a buyer. (You have won the pen in front of you in the lottery, so you are a seller.) You purchase a pen in the case that the price which is determined later in the experiment is acceptable to you. (You sell your pen in the case that the price which is determined later in the experiment is acceptable to you.)

Please enter a price up to which you are willing to buy the pen in the field below. (Please enter a price from which you are willing to sell the pen in the field below.) It has to be between 0 and 5.0 € and should only have one decimal place. Possible prices are thus 0.1 € 0.2 € ... , 4.9 € 5.0 € The transactions will take place after the experiment. You can voluntarily explain your pricing decision on the back of the questionnaire.

3. Hypotheses

The predictive theory to be tested in the experiments described above can be summarized by the following hypotheses. In our experimental setting, the presumably positive effect of labor on people's valuations for a good was examined (cf. Norton 2009). Furthermore, the sellers in the trophy treatment may have felt like winners for being rewarded with items, which might have led to increasing their WTA even more. Frey and Neckermann (2008, p. 199) argue that "working towards an award generates procedural utility."³ Thus, the hypothesis to test the trophy effect can be written as follows:

Trophy Effect

If people work successfully and are rewarded for this with an item, they tend to overvalue it.

(Null hypothesis: $WTA_{trophy} = WTA_{baseline}$; alternative hypothesis: $WTA_{trophy} > WTA_{baseline}$)

While analyzing the effect of awards in economic surroundings, one intuitively focuses on those who were rewarded. But what about those who come away empty-handed? These people with no reward might feel like losers, which could have negative consequences with

³ In Frey et al. (2004, p. 381) procedural utility is defined as "the well-being people gain from living and acting under institutionalized processes as they contribute to a positive sense of self, addressing innate needs of autonomy, relatedness, and competence."

respect to their achievement motivation (Frey and Neckermann 2008). Moreover, Norton et al. (2010) state that labor only leads to an increase in valuation if it is fruitful; additionally, according to Bandura (1977), the successful completion of tasks is a means by which people can achieve their goal to feel competent. Alternatively, Zeigarnik (1935) notes that subjects dwell on tasks they failed to bring to a favorable conclusion. In our experimental design, these factors might have consequences for participants whose test results were below the median and who therefore did not get a pen.

The pen might be regarded as a symbol of defeat which reminds the participants of their underperformance during the test, leading to frustration that precipitates a refusal to buy one. Accordingly, the reverse trophy effect would reveal a mean WTP articulated by members of the experimental group which lies below the average WTP elicited in the baseline treatment.

Reverse Trophy Effect

Unsuccessful labor induces a decrease in valuation of the object one worked for.

(Null hypothesis: $WTP_{trophy} = WTP_{baseline}$; alternative hypothesis: $WTP_{trophy} < WTP_{baseline}$)

As mentioned above, we also tried to isolate the different components of the trophy effect, namely the effect of work and the effect of winning. The potentially positive effect of labor on valuation was tested in the work treatment. Presumptive sellers also had to strain themselves in a mathematics test and were subsequently endowed with pens, independent from their test results. If work generally has a positive effect on valuation, the WTA elicited in the work treatment should substantially exceed the WTA determined in the baseline treatment.

Work Effect

If people work in order to obtain an item, they are inclined to overvalue it.

(Null hypothesis: $WTA_{work} = WTA_{baseline}$; alternative hypothesis: $WTA_{work} > WTA_{baseline}$)

Furthermore, we claim that winning in itself is a component of a subject's utility. Results of recently conducted experiments have shown that subjects might care about winning per se (Sheremeta 2010). Goeree et al. (2002) directly addressed the utility of winning. They found that overbidding in auctions suggests the presence of an upward bias which can either be caused by risk aversion or a “joy of winning”. By the latter they mean that a subject’s utility is increased if he or she makes money in an auction. Further studies referring to the utility of winning are Herrmann and Orzen (2008) and Cox et al. (1988). Thus, in the context of our

experimental tests, winning an item in an explicit lottery might induce a higher valuation for the prize than the traditional endowment effect generally evokes.

Lottery Effect

If people win an item in an explicit lottery, they overestimate its value.

(Null hypothesis: $WTA_{lottery}=WTA_{baseline}$; alternative hypothesis: $WTA_{lottery}>WTA_{baseline}$)

4. Results

Table 1 summarizes our main results. In every market, we found an endowment effect, i.e., the WTAs differ significantly from the corresponding WTPs. Comparing the sizes of these effects is even more interesting. In the baseline treatment, we replicated the results of previous endowment effect experiments (Kahneman et al. 1991). The mean WTA (2.86 €) exceeded the mean WTP by slightly more than a factor of 2 and 40% of the theoretically expected market transactions took place. The market equilibrium price resembled the true price of the pen.

When making the lottery to become a seller explicit by drawing lottery tickets, the WTA/WTP-ratios increased slightly. However, the average $WTA_{lottery}$ and $WTP_{lottery}$ were not significantly different from the baseline treatment. This did not change in the work treatment, although the average WTA increased to 3.58 € when the subjects had to work for the traded good.⁴

The only significant differences to the ordinary endowment effect of our baseline treatment can be observed in the trophy treatment where subjects had to work for the feeling of being a winner. Thereby, the lottery effect and the work effect seem to add up. Participants who were rewarded for their good work in the mathematics test had a mean WTA that was much higher than the mean $WTA_{baseline}$ (*trophy effect*). On average, they only wanted to accept offers of 4.40 € for a pen that you can buy for 2.10 € at the campus store. By contrast, participants of the mathematics test that did not manage to get a pen had much lower WTPs than the WTPs

⁴ Here it is interesting to recall the prediction bias coined by Lowenstein and Adler (1995). They found that people systematically misjudge future utility due to underestimating the impact of ownership. In other words, people seem to be unable to predict the endowment effect. Our findings confirm that this prediction bias also holds for the impact of work. Before taking part in the mathematics test, presumptive sellers were asked to predict their own valuation for the pens. On average they indicated an anticipated WTA of 1.90 €, whereas they stated an actual mean WTA of 3.58 € a few minutes later. This discrepancy was found to be highly significant ($p=0.018$, Wilcoxon signed rank test), suggesting a bias in predicting one's preferences also in light of the work effect.

of the baseline treatment – the median WTP of the trophy market was 0.50 € and the median WTP of the baseline market was 1 € (*reverse trophy effect*). These two effects amplify the endowment effect, resulting in an unusually high ratio of median WTA/median WTP of 9.6 for an everyday market item, and a total collapse of the market!

Table 1: Summary of the Treatment Results

	N	equilibrium		WTA		WTP		WTA/WTP	
	$\sum 76$	quantity	price	mean	median	mean	median	means	medians
baseline	$\sum 18$	2	2.00 €	2.86 €	3.00 €	1.26 €	1.00 €	2.27	3.00
lottery	$\sum 22$	2	2.33 €	3.43 €	3.30 €	1.23 €	0.90 €	2.79	3.67
work	$\sum 16$	1	2.32 €	3.58 €	3.50 €	1.19 €	0.95 €	3.01	3.68
trophy	$\sum 20$	-	-	4.40 ^{##} €	4.80* €	0.57 [#] €	0.50* €	7.72	9.60

Notes: * Significantly different ($p < 0.05$) from the baseline treatment (two-sided Mann-Whitney U test)

[#] Significantly different ($p < 0.05$) from the baseline treatment (LSD post hoc test after ANOVA⁵)

^{##} Significantly different ($p < 0.01$) from the baseline treatment (LSD post hoc test after ANOVA)

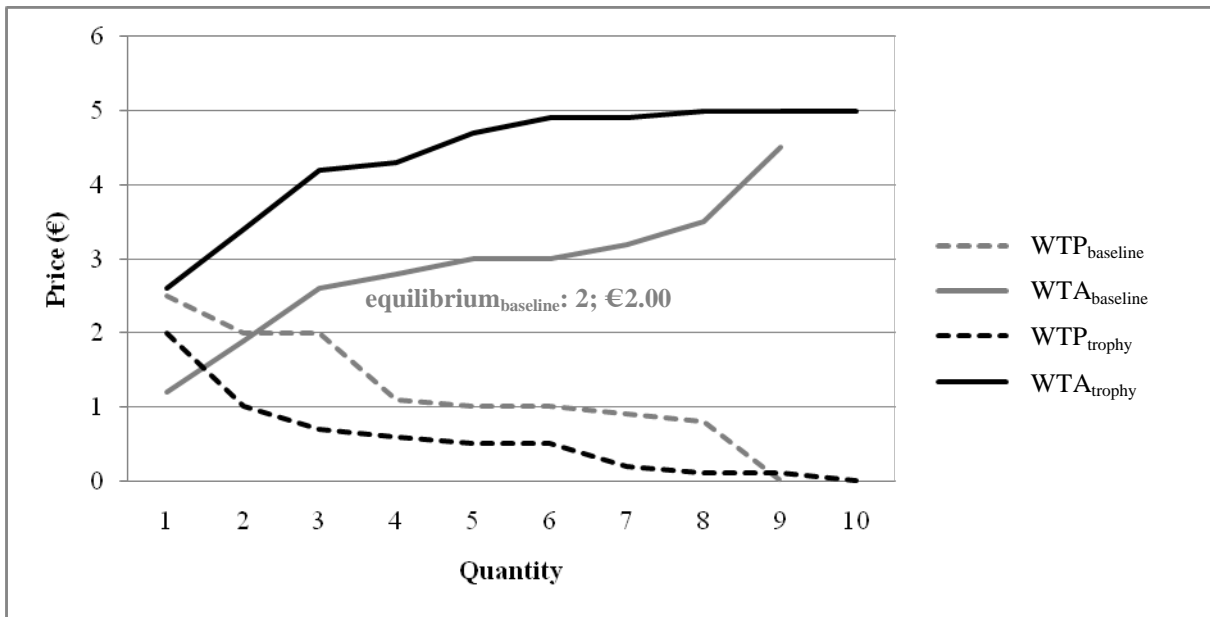
Figure 1 illustrates the complete market failure in our trophy treatment. Whereas in the baseline treatment at least two transactions took place, the demand curve of the trophy treatment did not intersect the supply curve at all. The behavior and feedback of our participants strongly support the trophy idea: One participant stated to feel strongly attached to the pen because she earned it and therefore chose the highest selling price possible. Thus, being awarded for one's good work can turn a mere pen into a trophy. The feeling of being a winner alone and the effort alone cannot induce such a strong effect. With regard to the latter aspect, it is important to notice that on average the effort in the mathematics tests of the work and trophy treatments (measured by points scored) were nearly identical.

Figure 1 also shows the reverse trophy effect: When you lose in an effortful competition, you do not want to be reminded of it. Almost defiantly, our subjects expressed WTPs that are much smaller than the WTPs of the baseline treatment and on average differ greatly from the true buying price.

⁵ Conditions for the ANOVA: Kolmogorov-Smirnov tests within the groups could not reject the null hypothesis that the data are normally distributed ($p > 0.59$). Levene tests could not reject the null hypothesis that the variances within the treatments are homogeneous ($p = 0.46$ for the WTA groups and $p = 0.22$ for the WTP groups). The group sizes were similar.

The F-test of the ANOVA was significant for the WTA groups ($p = 0.038$) and insignificant for the WTP groups ($p = 0.189$). The nonparametric Kruskal-Wallis test was significant for both the WTA- and WTP-comparisons ($p = 0.031$ for the WTA groups and $p = 0.096$ for the WTP groups).

Figure 1: Trophy Effect



Note: WTA sorted from highest to lowest; WTP sorted from lowest to highest

5. Discussion

According to the trophy effect, successful labor one is rewarded for creates economic value for the worker. The trophy effect implies that people tend to overvalue “trophies” they had to work for in order to obtain them. The intensity of this effect might even be enforced by ceremoniously handing over the objects participants had to work for. Dufwenberg and Muren (2005) tested participants’ reactions in a dictator game for this impact. Their results reveal that dictators give significantly less when they are remunerated in front of others rather than in private. Thus, awarding the best students in the mathematics test with their “trophy” in front of the group could lead to enhancing their valuation even more, presumably inducing a higher WTA on average.

Strongly related phenomena to the trophy effect are the already mentioned IKEA effect (Norton et al. 2010) and the “I designed it myself” effect in mass customization. Franke et al. (2010) defined the latter as the increase in value a subject attributes to self-designed objects which solely arises from the fact that she feels like the creator of the good. The big difference between the trophy effect and its two counterparts is that the work in the trophy effect is not invested in the good itself. Whereas in our trophy experiment people’s successful work increases the valuation of the award (and decreases the valuations from unsuccessful workers for the same item), the IKEA and “I designed it myself” effects comprise people’s overvaluation of their own creations.

In future research, the trophy effect and the closely related IKEA effect need to be sharply delineated. For instance, one could compare the valuations of subjects that win an already constructed Billy shelf in an unrelated competition to those of subjects that win a Billy shelf after constructing it on their own.

What the trophy and the IKEA effects have in common is that they provide very important marketable implications. For instance, in the 1950s cake mixes were introduced (Shapiro 2004, Norton 2009). These ready-mixes were very simple, allowing even un-experienced cooks to prepare delicious pastries within minutes. Housewives regarded these mixtures as a humiliation since their labor was not adequately valued. Hence, they simply did not buy these products. Manufacturers reacted to this problem by changing the mixes. The new cake mixes involved the addition of eggs etc. Surprisingly, this increase in the work required led to a greater acceptance.

Plenty of firms have since then begun to commercialize user design, e.g., by offering websites which allow customers to design their own individual kitchens, sneakers or shirts online. Thereby, the company can produce customized products in accordance with their customers' wishes (Dellaert and Stremersch 2005, Randall et al. 2005). The economic value of such products created via mass customization has been assigned to two factors (Franke et al. 2010): on the one hand, the achieved preference fit (which ought to be high) and on the other hand, the effort of customers who help design their products (which ought to be low). Franke et al. provided experimental evidence which indicates that besides these two aspects, the mere awareness of being the originator of a good creates economic value for customers, inducing a substantially higher WTP. The intensity of this effect is associated with feelings of accomplishment and the individual's apprehended contribution to the production flow.

The effect of successful labor on valuation has also implications for organizational dynamics and innovation management (cf. Norton et al. 2010). For instance, managers might proceed to use more resources for projects in which they have already invested a lot of work (IKEA effect) or for which they had to work hard to become the project leader (trophy effect). This phenomenon contributes to the sunk-cost effect (Arkes and Blumer 1985), which implies that people frequently act irrationally by allowing irreparable investments to affect their judgments. In this connection, projects might be completed although they are expected to fail, leading to a waste of resources and to inhibiting innovation (Biyalogorsky et al. 2006).

Moreover, the trophy effect might contribute to the “Not-Invented-Here” syndrome, documented by Katz and Allen (1982), which essentially describes the phenomenon that managers and companies sometimes avoid buying or implementing already existing ideas or products due to their external origin. In an extreme case, the trophy effect could lead to a complete rejection of ideas developed elsewhere, although they might be objectively superior to the internally generated knowledge. Hence, managers should be made aware that their preference for their own ideas and projects might originate from the labor required in order to become project leaders; in this way failures might be prevented, since coworkers or costumers may not always share their opinion (cf. Norton 2009).

Trophies and awards can substantially influence people’s utility. Economic status models suggest that obtaining an award enhances relative standing, leading to an increase in winners’ effort and a decrease in losers’ effort (Auriol and Renault 2008), especially in the context of a zero-sum game. For instance, in a group of employees, those who are awarded (“winners”) might deliver better work results whereas those who come away empty-handed (“losers”) might reveal a measureable downturn in achievement motivation. However, the empirical findings offered by Neckermann et al. (2009) do not support this intuitive statement. Focusing on employees of a financial services company, they did not find any negative effects of awards on the motivation of the non-rewarded. They found that those who did not get an award still saw the chance to receive one in the future, and therefore did not decrease their performance. While the chance of being awarded in the future is lacking in our experiment, our findings are not in line with Neckermann and his coauthors. In our trophy treatment, subjects whose test results were below the median and who thus did not get an “award”, almost defiantly expressed a mean WTP of 0.57 € for the pen (which was worth 2.10 €), indicating that they did not regard the award as desirable.

In line with our reverse trophy effect, Norton et al. (2010) also found an antithesis to their IKEA effect. They showed that labor increases valuation only if it is successful. Participants who failed in completing an origami bid significantly less on their work compared with the work of others’ origami. In our experiment, students who did not perform well in the mathematics test refused to buy a pen afterwards, which could remind them of their underperformance. Unsuccessful labor leads to negative feelings and regret (Savitsky et al. 1997), thereby not increasing but rather decreasing the valuation for an item. Successful completion can thus be considered as a crucial element to the linkage between labor and liking. In this context,

some studies stress the motivational advantages of instructions that employees feel able to follow (e.g., Grant and Parker 2009). This avoids frustration.

According to these findings, companies should be diligent in creating tasks that are characterized by a balanced relationship between customers' effort and their extra utility associated with the performed labor to get the product (cf. Dellaert and Stremersch 2005).

Further research is needed to analyze the conditions under which and to what extent the trophy and the reverse trophy effects can be observed in the field. We claim that these effects are not just relevant for trophies in the narrow sense of the word (e.g., tennis trophies). They can also be found to influence markets of other goods that are obtained by successful work. And obtaining a good for one's good work seems to be a pretty usual event to us.

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