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Vanessa Mertins, Susanne Warning

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Institute for Labour Law and Industrial Relations in the
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54286 Trier
www.iaaeu.de

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Vanessa Mertins[a], **Susanne Warning**[b]

[a] Institute for Labour Law and Industrial Relations in the European Union (IAAEU), University of Trier, 54286 Trier, Germany, e-mail: mertins@iaaeu.de, phone: +49- 651-201-4746 , fax: +49-651-201-4742 (corresponding author).

[b] University of Augsburg, D-86159 Augsburg, Germany, susanne.warning@wiwi.uni-augsburg.de.

Abstract

It has recently been claimed that women's social preferences are easier to manipulate than men's. We test for gender differences in the responsiveness to a homo economicus prime in a gift-exchange experiment. Primed male participants behaved more selfishly than non-primed men as expected. However and surprisingly, for women we observe no priming effect at all. To explain this result, we suggest that prime-to-behavior effects are sensitive to individuals' associations with the prime. We surveyed 452 students to test whether the homo economicus prime activates systematically different associations among men and women. We found strong evidence that women have significantly less positive associations with the homo economicus concept than men, pointing to a likely reason for the missing effect among women.

Keywords: priming, gender difference, gift exchange, experiment, reciprocity

JEL classification: C91, D03, D63, M52

1 Introduction

Situational cues frequently influence social decision-making. A common approach to expose subjects experimentally and subtly to behavior-relevant cues is the use of *priming* techniques, by which stereotypes, traits, or other action-relevant constructs are made salient and influence behavior unconsciously (see Dolan et al., 2012; Ferguson & Bargh, 2003; Wheeler & Petty, 2001 for reviews). Although these effects are initiated relatively automatically, they are not necessarily invariant across different groups of people. In particular, the same, even weak, situational cue can have different effects on men's and women's subsequent choices. Based upon an extensive literature review, Croson and Gneezy (2009) conclude that the behavior of female participants in economic experiments is much more variable and inconsistent across different environments. Thus, the social preferences of women might be more sensitive to situational cues, and hence, to primes, than those of men. Empirical evidence, however, is still very limited and results are mixed. The prime-to-behavior effects reported by Drouvelis, Metcalfe, and Powdthavee (2010) support the assertion that women are more responsive to primes than men, as priming toward cooperation increased women's cooperativeness, but not men's. To the opposite, Rigdon, Ishii, Watabe, and Kitayama (2009) observed a priming effect among men in a dictator game, but not among women.

We contribute to the literature in that we test for gender differences in responsiveness to a *homo economicus prime* in a carefully controlled gift-exchange experiment. In this game, two behavioral strategies are distinguished: rational, selfish decisions and other-regarding, reciprocal decisions. First, we examine whether activating the homo economicus concept lead people to behave selfishly. Second, we hypothesize gender differences in the magnitude of prime-to-behavior effects.

Standard economic assumptions would not imply a situational cue to influence decision-making. Recent research from behavioral economics, however, suggests that choices may be sensitive even to very weak cues. In particular, there is some evidence that priming for money and economic concepts negatively affects pro-social behavior (Kay et al., 2004; Pfeffer & DeVoe, 2009; Vohs, Mead, & Goode, 2006). Accordingly, we expect that a homo economicus prime increases the number of selfish choices.

What has not been considered thus far is a gender difference in responsiveness to such a cue. This, however, is interesting for at least two reasons: First, on a conceptual level, our study complements the literature on the role of situational cues in that we use a different, contrary

prime to the one's used before to examine whether prime-to-behavior effects are generally observed, i.e. independent of the priming content. Second, on a more practical level, we examine gender differences in the labor market, a setting where we observe numerous differences between men and women which could be viewed to be a result of situational cues. Therefore, we hypothesize the responsiveness to a homo economicus prime to differ between genders with the social preferences of women being easier to manipulate toward selfishness than those of men. Croson and Gneezy (2009) showed in an extensive literature survey that results on social preferences appear inconsistent at first glance. Some studies revealed that women are more reciprocal than men (e.g., Buchan, Croson, & Solnick, 2008; Croson & Buchan, 1999; Eckel & Grossman, 1996; Schwieren & Sutter, 2008) while others did not find any gender difference (Bohnet, 2007; Clark & Sefton, 2001; Cox & Deck, 2006). Based on a notion by Gilligan (1982), the authors explain the mixed empirical results with women being more sensitive to their social environment and thus to social cues compared to men. Accordingly, we argue that homo economicus priming before playing a gift-exchange game affects behavior in male and female participants differently: both groups are expected to behave more selfishly in the treatment condition compared with the control condition, but the effect of the homo economicus prime should be stronger for women than for men.

2 Background

Although priming effects are ubiquitous in psychological research and marketing science, economists only recently started to take the idea seriously that the implicit activation of stored knowledge may affect choices and actions (e.g., Christian & Alm, forthcoming; Kliger & Gilad, 2012; Matthey, 2010). Indeed, there is robust empirical evidence that priming affects subsequent behavior in various settings using various methods. Early examples include studies showing that activating the elderly stereotype decreased memory performance (Levy, 1996) or encouraged individuals to walk more slowly (Bargh, Chen, & Burrows, 1996). Women who had been told a math test yielded gender differences showed lower math performance (Spencer, Steele, & Quinn, 1999), and participants primed with the typical characteristics of a soccer hooligan showed lower performance on a general ability test than those primed toward the characteristics of a professor (Dijksterhuis & Van Knippenberg, 1998). Objects related to business (e.g., briefcases, boardroom tables) increased selfish choices in the ultimatum game, while a backpack triggered the opposite behavior (Kay, Wheeler, Bargh, & Ross, 2004). Taken together, there is impressive evidence that social

norms, goals, emotions, and social behavior can be influenced through priming (Bargh, 2006), not only in experimental settings but also in the field (see, e.g., Aarts & Dijksterhuis, 2003; Berger, Meredith, & Wheeler, 2008).

Researchers have also shown that experimental primes can alter choices and actions similarly under subliminal and more conscious priming conditions. Thus, effects can be stimulated relatively automatically based on activated stored knowledge and associations with a prime. Accordingly, prime-to-behavior effects should be highly predictable, especially in cases where subliminal primes are used to prompt unconscious effects. This view, however, seems to be incomplete as a discussion on "second-generation" (Bargh, 2006, p. 148) effects suggests. A more recent strand of literature explores differences in priming effects between individuals. This work shows that the same prime may have different and sometimes even opposing effects across subgroups, depending on individual characteristics such as the extent of stored knowledge or individual associations with a prime (for a review of the psychological literature, see Wheeler & Berger, 2007).

Evidence of the potential moderators of priming effects on economically relevant behavior is still rare. A notable exception includes work by Gilad and Kliger (2008), who analyzed differences in the magnitude of prime-to-behavior effects among two subgroups of people, undergraduates and financial professionals. The authors found that expertise moderates behavior: The priming stimulus had a stronger effect on the investment decisions of professionals than on undergraduates' decisions. Benjamin, Choi, and Strickland (2010) tested the marginal effect of race identity. When race was salient, white participants made more patient decisions and showed lower risk-aversion, whereas black participants became more risk-averse. In a similar attempt, Benjamin, Choi, and Fisher (2012) studied the effect of religious identity on social preferences by the change in participants' choices when religion was salient.

There is also some evidence that gender differences in responsiveness to primes exist. One example is Wheeler and Berger's (2007) work. In a clothes shopping context, they showed that men and women not only have divergent associations with the same stimulus, but also make divergent decisions that are consistent with gender-specific associations.

Close to our setting is work by Rigdon et al. (2009) and Drouvelis et al. (2010) in that they tested the effects of situational cues on men's and women's revealed preferences using incentive-compatible mechanisms. Drouvelis et al. (2010) reported that priming participants

toward cooperation (using priming words such as teamwork, collaborate, support, or contribute) increased women's giving in a public goods experiment, but not men's contributions. Rigdon et al. (2009) demonstrated that a weak social cue (three dots arranged as a "v" as remainder of "watching eyes") had significant effects on subsequent choices in a dictator game. Their prime increased giving behavior significantly among men, but had no effect among women.

We study the effect of a homo economicus prime that was subtle (people are not aware of it) and sufficiently unspecific to invite various perceptions. Unlike previous studies, our design does not aim at increasing other-regarding, but own-payoff maximizing, selfish behavior following the neoclassical approach to human behavior. We aim to see whether a weak situational cue may activate the homo economicus concept in that it heightens the accessibility of this concept, resulting in more selfish decisions, and whether this potential effect is gender invariant. We apply a setting that is perceived to be rather robust against various environmental conditions: laboratory gift-exchange. Numerous studies (e.g., Fehr, Kirchsteiger, & Riedl, 1993; Hannan, Kagel, & Moser, 2002) prove that agents' average effort increases in principals' wage offers, indicating a substantial fraction of reciprocal choices. Although the results from laboratory experiments are broadly conclusive, the evidence from field experiments is rather mixed. Whereas some field data provide weak or moderate support for positive reciprocity (e.g., Gneezy & List, 2006; Kube, Marechal, & Puppe, 2012), others confirm the laboratory findings (e.g., Bellemare & Shearer, 2009). The presence of situational cues not controlled for in the field might be an intuitive explanation for why the extent of reciprocity differs between laboratory and field experiments. The present study aims on contributing to the understanding of a causal relationship between the subtle exposure to a situational cue and reciprocal behavior (Charness & Kuhn, 2011; Falk & Heckman, 2009).

3 Experimental design and hypotheses

3.1 The gift-exchange game

Participants played a bilateral one-shot gift-exchange game in the labor market context (Charness, 2004; Fehr et al., 1993; Fehr, Kirchler, Weichbold, & Gächter, 1998). First, a principal specified a wage, $w \in \{20, 40, 60, 80, 100\}$. . Then, the paired agent chose an effort

level, $e \in [0.1, 0.2, ..., 1.0]$, which went along with costs *c(e)*. Efforts and corresponding costs are shown in Table 1. The combination of wage and effort determined the outcomes for the principal ($\pi = (120 - w)\, e$) and the agent ($U = w - c\,(e)$).

Table 1: Schedule of cost

e	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
c(e)	0	1	2	4	6	8	10	12	15	18

Different theories concerning players' preferences suggested different behavioral predictions. Standard game theory predicts agents will choose the minimum effort level regardless of the wage offer. Principals in turn are expected to choose the minimum wage level. A huge amount of literature, however, suggests that people are not purely selfish, but are endowed with social preferences. In the gift-exchange game, a substantial fraction of agents reciprocates generous wages with positive effort choices (e.g., Fehr et al., 1993; Gächter & Fehr, 2002), and principals, accordingly, set non-minimal wages. This is in line with outcome-based models of social preferences assuming that agents are inequity-averse (e.g., the guilt-envy theory by Fehr and Schmidt, 1999, or the theory of equity, reciprocity, and competition by Bolton and Ockenfels, 2000), and with intention-based models of reciprocity (e.g., Dufwenberg & Kirchsteiger, 2004; Falk & Fischbacher, 2006; Rabin, 1993).

3.2 Experimental design

Our priming protocol followed a commonly applied procedure (e.g., Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Drouvelis et al., 2010) in that participants were asked to solve an initial word search task. A 12×11 matrix of letters was presented together with a list of 13 words. These words were hidden within the puzzle and could appear in a straight line or diagonally. The instructions informed participants that they would have a total of 5 minutes to find as many words as they could, but their total earnings from the experiment would not be affected by their performance on this task. The homo economicus prime treatment was implemented by presenting the participants a list of treatment and neutral words. The treatment words were the following: *calculate*, *money*, *maximize*, *benefit*, *goal-oriented*,

rational, and *winning*. We selected those words according to the result of a pre-test in which we asked 10 men and 10 women to describe the homo economicus concept in their own words. The seven words most commonly used were chosen as priming words. The neutral words were *plant*, *window*, *hat*, *lamp*, *zebra*, and *carpet*. After the priming stage, the participants read the instructions for the gift-exchange game. In the control treatment, the participants did not solve a puzzle but read the instructions for the gift-exchange game immediately.

We implemented three specifics in our experimental setup, which were intended to ensure the participants fully understand the game. In particular, it seemed critical that there were no gender differences at the level of misunderstanding the structure of the game or at the level of inadequately reflecting on behavior, as these gender differences might override gender differences in responsiveness to the priming protocol. First, all participants were asked to answer several test questions about hypothetical decisions and resulting earnings before the actual game took place to acquaint themselves with the payoff mechanism. Second, to be able to identify distinct types of players (Altmann, Dohmen, & Wibral, 2008; Fischbacher, Gächter, & Fehr, 2001; Maximiano, Sloof, & Sonnemans, 2007), selfish and reciprocal, we used the strategy vector method (Selten, 1967). Before the participants learned their randomly assigned role, they indicated the wage offer they would extend in the role of the principal and their contingent effort decisions for each possible wage offer in the role of the agent. Although we focused on decisions in the role of agents, this procedure ensured that the participants thought about co-players' behavior explicitly, putting the participants directly "in the shoes" of a decision-maker in each role. However, this procedure has been proved not to render behavior (Oxoby & McLeish, 2004). Third, since choosing to behave like a homo economicus requires individuals to understand the underlying strategy, all participants were asked to provide the game-theoretic solution of the game before actually making decisions. This not only provided a measure for understanding the game (i.e., equilibrium correctly identified), which we used as an additional control variable but may also have rendered behavior. Indeed, as this procedure has some features of a "recommended play" treatment (Oxoby & McLeish, 2004), we realize that behavior may be directed toward the equilibrium outcome; thus, a larger-than-usual observed fraction of selfish players might have been found in our sample.[1] However, none of these features would have an effect on the difference

[1] As we observed a particularly large fraction of homines economici among women in our control treatment, this procedure may indeed have had the intended effect, at least among women.

between primed and non-primed participants, as everything but the priming protocol was constant.

After the priming task (Appendix 1), which was presented to the treatment group only, the instructions for the treatment and control group were identical. The written instructions (Appendix 2) were based on the ones used by Charness (2004). First, the participants answered several test questions. Second, the participants were asked to provide the game-theoretic solution intuitively. Third, the participants decided on wage and effort. Fourth, participants answer a short questionnaire. To check whether the participants were aware of the priming manipulation, those in the priming condition answered several additional questions at the very end of the questionnaire. They were asked about their thoughts on the goal of the study, whether they had anticipated any relation between the word search task and the experimental game (and if so, what this relationship was), and whether they had realized a particular theme in the word search task.

The paper-and-pencil experiment was conducted among 113 students from November 2011 to January 2012 at a German University. 108 among the 113 students behaved consistently in a selfish or in a reciprocal way while five show noisy behaviors and are therefore excluded. Students participated only once and had neither previous experience in economic experiments nor substantial knowledge of game-theoretic concepts. Both men and women were randomly allocated to the experimental treatment *homo economicus prime* or the control treatment *no prime*. One subject in the homo economicus prime condition reported being influenced by the priming task. Although she did not correctly guess the goal of the study, the data for this participant were excluded from further analyses. Each session lasted about 40 minutes, and the average payoff was 7.84 Euro (excluding a fee for showing up). After the participants completed the experiment, sheets were collected, roles were randomly allocated, pairs of players randomly and anonymously matched, respective payoffs calculated, and the participants paid and dismissed.

3 Results

To test our hypothesis, we proceed in three steps. First, we classify participants according to their behavior as agents using the sequence of their effort choices (Maximiano et al., 2007). We consider two distinct types of strategies: homo economicus (selfish) behavior (agents chose the minimum effort level regardless of the wage) and homo reciprocans (reciprocal)

behavior (agents increased the effort with wages in a monotonic way). Second, to get a first impression of the validity of our hypothesis, we provide a simple bivariate test whether men and women react differently to priming. Third, to control for individual characteristics, in an econometric analysis we report the influence of priming moderated by gender on the probability of being homo economicus. Our dependent variable is a dummy, indicating whether a participant behaved like a homo economicus or not; thus, we ran simple probit regressions. Our independent variables of interest are female, priming, and the interaction female x priming. As control variables for participants' game-theoretic skills and general ability, we include a dummy variable "equilibrium correctly identified" indicating if the participant had identified the payoff-maximizing strategy correctly, the average final grade in high school mapping general cognitive ability, and a dummy for business and economics indicating the students' major. The latter variable was introduced to account for the robust finding that economists are more selfish than others (e.g., Carter & Irons, 1991; Cipriani, Lubian, & Zago, 2009; Marwell & Ames, 1981).

First, about 18.2 percent of our non-primed participants behaved like a homo economicus, which reflects almost the standard results (e.g., Maximiano et al., 2007). Among the participants primed on homo economicus, about 22.6 percent behaved selfishly, which was not significantly different from our non-priming treatment, 18.2 percent ($p = 0.565$, chi-square test). We also did not observe significant gender differences regarding selfish behavior among all participants: 21.2 percent of women and 19.1 percent of men ($p = 0.785$, chi-square test) behaved selfishly.[2]

Second, we intend to test whether the effect of priming was stronger for women than it was for men. We start with testing whether priming increased the share of homo economicus among men and women separately. For men, the share of homo economicus under priming (0.350) is larger than in the non-priming treatment (0.045). The difference in shares is significant at $p = 0.013$ (Mann-Whitney test[3]). Thus, the homo economicus prime increased selfish behavior among men significantly. Surprisingly, for women, the share of homo economicus under priming (0.155) is not larger than under the non-priming treatment (0.273). Obviously, this does not support our hypothesis; the descriptive results do not even exhibit the expected direction of the effect. On the contrary, we found that the share of homo economicus

[2] The results did not change qualitatively when the Fisher exact test was applied.
[3] The results did not change qualitatively when an ordinary t-test was applied.

is even smaller under priming than under non-priming for women - though this finding is not statistically significant.

Third, we test our hypothesis in a multivariate analysis. All models in Table 2 take the interaction priming x female into account to identify the different effect of priming for men and women on the probability of homo economicus behavior. We observe a significantly negative coefficient of this interaction term in all specifications. However, as the probit is not a linear estimator, we cannot interpret the size of the coefficient directly (Ai & Norton, 2003). Therefore, we compute conditional marginal effects for priming across men and women in our most comprehensive model 5, fixing all other variables to the mean. Then, for men, priming significantly increased the probability of behaving like a homo economicus by 0.336 ($p = 0.004$). In contrast, for women, priming even decreased the probability for homo economicus behavior by 0.082 – but the effect is not statistically significant.

Our results hold when controlling for general ability and game-theoretic understanding. Both affect the probability for homo economicus behavior. General ability—measured with the average high school grade—has a negative effect, which is in line with our expectations as lower grades indicate higher general skills.[4] Game-theoretic understanding—mapped by identifying the equilibrium of the gift exchange game correctly—also increases the probability of homo economicus behavior. Studying economics does not show an effect on the probability of behaving selfishly in any model. However, the negative coefficient of the interaction term remains statistically significant across all specifications (model 1 to 5).

Taken together, the empirical results do not confirm our hypothesis: Presenting a subtle homo economicus prime before playing a gift-exchange game enhances selfish behavior in men, but not in women. In particular, the homo economicus prime does not direct female behavior to selfishness. This finding is robust against adding various control variables. Thus, male, not female, choice behavior is more responsive to our situational cue. This finding contradicts observations by Drouvelis et al. (2010), but is in line with the one reported by Rigdon et al. (2009).

[4] Grades in Germany run from 1 to 6, with 1 the highest and 6 the lowest grade.

Table 2: Results from the probit regressions

	Model 1	Model 2	Model 3	Model 4	Model 5
Priming	1.305**	1.308**	1.431***	1.600***	1.782***
	(0.549)	(0.534)	(0.549)	(0.548)	(0.595)
Female	1.086**	1.087**	1.353**	1.006*	1.330**
	(0.522)	(0.515)	(0.533)	(0.534)	(0.582)
Priming x female	-1.731***	-1.732***	-1.986***	-1.795***	-2.122***
	(0.654)	(0.650)	(0.673)	(0.676)	(0.756)
Business or economics		-0.016	-0.009	0.037	0.055
		(0.304)	(0.306)	(0.310)	(0.313)
Equilibrium correctly identified			0.794**		0.746**
			(0.312)		(0.345)
Final high school grade				-0.899***	-0.859***
				(0.270)	(0.283)
Constant	-1.691***	-1.682***	-2.313***	0.463	-0.313
	(0.467)	(0.544)	(0.583)	(0.867)	(0.917)
Observations	108	108	108	108	108
Pseudo R2	0.077	0.077	0.140	0.186	0.233
Correctly predicted	79.630	79.630	79.630	78.704	79.630

Notes: A dummy for homo economicus is the dependent variable. *** significant at 1 percent, ** significant at 5 percent, * significant at 10 percent. Robust standard errors in parentheses (White, 1982).

To further investigate the surprising effect on women, we modify our dependent variable and analyze gender differences in the degree of reciprocity. For each participant, we run simple OLS regressions to explain the effort level (multiplied by 10 to normalize coefficients) by wage level and interpret the coefficient of wage level as degree of reciprocity (Maximiano et al., 2007 for the general approach). Consequently, a coefficient of zero indicates a level of

reciprocity of zero which in turn is equivalent to selfish behavior.[5] Exogenous variables are the same as in the probit model. Table 3 shows the results.

Table 3: Results from the OLS regressions

	Model 6	Model 7	Model 8	Model 9	Model 10
Priming	-0.308**	-0.317***	-0.323***	-0.322***	-0.326***
	(0.119)	(0.117)	(0.119)	(0.118)	(0.119)
Female	-0.217**	-0.217**	-0.259***	-0.162*	-0.203**
	(0.095)	(0.092)	(0.092)	(0.092)	(0.095)
Priming x female	0.420***	0.416***	0.443***	0.374**	0.401***
	(0.150)	(0.149)	(0.147)	(0.148)	(0.148)
Business or economics		0.139*	0.139*	0.123	0.126
		(0.080)	(0.077)	(0.078)	(0.076)
Equilibrium correctly identified			-0.173**		-0.137*
			(0.071)		(0.072)
Final high school grade				0.175**	0.151**
				(0.069)	(0.070)
Constant	0.873***	0.784***	0.894***	0.313	0.466**
	(0.061)	(0.081)	(0.085)	(0.211)	(0.222)
Observations	108	108	108	108	108
Adjusted R-squared	0.050	0.070	0.112	0.130	0.153

Notes: The wage effort slope is the dependent variable. *** significant at 1 percent, ** significant at 5 percent, * significant at 10 percent. Robust standard errors in parentheses (White, 1982).

Also in this modified model, the interaction term is statistically different from zero supporting the different effect of priming for men and women on the degree of reciprocal behavior. As we run a linear model, the size of the effect can be evaluated easily: Model 10 shows that

[5] We exclude two participants with coefficients of zero: one chose an effort level of 0.4 for all wage levels; the other chose an effort level of 1.0 for all wage levels. Both do not fulfill our definition of the homo economicus. However, results are not driven by these exclusions.

under priming, reciprocity is significantly smaller for males; more precisely, priming reduces the degree of reciprocity by 0.325 in males. Again, there is no significant effect in females. All results hold after including the control variables as in the probit regressions in Table 2.

Taking together these results, we expected to see gender differences in the magnitude of the prime-to-behavior effect with females being more responsive to the manipulation than men. To the contrary, we found that women did not respond to the manipulation at all. To further elaborate on this interesting finding, we offer a post hoc explanation with further research needed to clarify the exact conditions that apply and the mental processes going on.

Research in related field has reported that prime-to-behavior effects are sensitive to individuals' associations with the prime (Bargh, 2006; Wheeler & Berger, 2007; Wheeler & Petty, 2001). Our homo economicus prime may have triggered differing associations (or emotional states) among men and women, and, consequently, affected individuals' subsequent choices in different ways. The assimilation effect (Wheller & Petty, 2001) among men (i.e., men's behavior becomes consistent with the prime) and the null result among females may arise if men have more positive associations with the homo economicus concept than women. This would imply that the effect of the homo economicus prime should be weaker for women than for men.

To test whether this conjecture is true, we designed a survey asking men and women about their perceptions of the homo economicus concept. In particular, we raised the following question: "Consider the following words [priming and neutral words used in the priming condition appear in random order]: Please choose the six words you consider most pleasant, most appealing." We ran this online survey in July 2012 at the same German University. None of the 452 students had participated in the experiment before. We found that men chose on average 3.744 priming words, while women picked only 3.248. This difference is highly significant ($p<0.001$) using a two-sided t-test, suggesting that women have significantly less positive associations with the homo economicus concept than men, and thus with the homo economicus prime. This finding indicates that the same prime may have activated different associations among men and women. Thus, the observed gender differences in prime-to-behavior effects are likely may be attributable to men and women having different prime associations.

5 Concluding remarks

This paper focused on individuals' responsiveness to a situational cue. In particular, we used priming as an unconscious reminder of the homo economicus concept and analyzed the impact on subsequent behavior in a gift-exchange game. We expected that this kind of manipulation increases selfish behavior in both males and females, with females being more responsive to the experimental treatment (Croson and Gneezy 2009).

Taken together, the observed behavior of males was consistent with the prime: Men exposed to a series of words linked to the homo economicus model behaved more selfishly. Contrary to the initial hypothesis, we did not observe a manipulation effect, and so no stronger responsiveness among women: Priming toward selfishness did not affect subsequent behavior of women.

We explain the observed gender differences in prime-to-behavior effects by differing associations of men and women with the particular priming stimulus. Whereas most priming research has focused on stimuli for which people are likely to have the same associations, a homo economicus prime may activate different associations across genders. By using a survey, we proved that indeed, men have significantly more positive associations with the homo economicus concept than women. Since associations can influence individuals' attitudes and behavior, gender-invariant associations are likely to have caused an assimilation effect among males and no effect among women.

Our study complements the findings of the recent priming study by Drouvelis et al. (2010). They find that priming subjects toward cooperation resulted in an assimilation effect among women and in no effect among men. Given this results and further empirical and theoretical evidence as discussed before, we expected women to react more sensitive to our priming stimulus compared to men. We, however, found that the homo economicus prime affected males' behavior only. By merging both findings, the regularity seems to be that priming results in an assimilation effect only among subgroups which are rather susceptible to the message content of the particular prime.

Our research shows that gender may not only affect the magnitude of the prime-to-behavior effect, but also the existence of a prime-to-behavior effect at all. Understanding gender differences is of particular importance in the gift-exchange context, as it may help to improve women's labor market outcomes. Furthermore, the responsiveness to even weak situational

cues adds to the ongoing discussion why reciprocity is strikingly robust in the laboratory, but not in the field. If a weak manipulation device such as the word search task we used is able to alter behavior in the lab significantly, unconscious situational cues not controlled for in the field may affect individuals' decisions without the awareness of the experimenter.

These findings also hint at an important methodological point, which prompts us to assert a note of caution. Obviously, situational cues should not be underestimated when inferring individuals' preferences from observed choices in economic experiments. This, however, is even more important if effects arise only among subgroups. Thus, our results emphasize the importance of understanding individual associations with primes and suggest that men and women may interpret experimental treatments differently. This, in turn, may be a source of different degrees of responsiveness.

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Appendices

Appendix 1: Priming task

The following 13 words are hidden in the puzzle:

PFLANZE	FENSTER	ZIELSTREBIG
HUT	MAXIMIEREN	RATIONAL
KALKULIERT	LAMPE	ZEBRA
TEPPICH	VORTEIL	GEWINNEN
GELD		

The words can be vertical, horizontal and diagonal.

Try to find all of the words.

K Z E B R A M R X G A M
A W I H B A P N Q E R V
L D F E N S T E R W L O
K L N I L T H I L I E R
U E N R O S U P O N U T
L A M P E P T X A N G E
I G T I O L M R G E A I
E P F L A N Z E E N T L
R E P M G A O Z L B D L
T E P P I C H S D P I A
M A X I M I E R E N M G

Appendix 2: Experimental Instructions

Original (German) instructions are available from the authors upon request.

General Information

Thank you for supporting this research project. You are participating in a study of the labor market. If you read these instructions carefully, you can earn some money. Your income will be paid out to you privately and in cash in the next lecture. During the experiment, your income will be calculated in Chips. At the end of the experiment, the Chips will be converted into Euros at the rate of:

10 Chips = 1 €

Each participant will be randomly assigned to a group of two people. Each group consists of an "**employee**" and an "**employer**". The role of a participant will also be randomly assigned. You will only find out later whether you are an employer or an employee. Therefore, it is necessary that you – as well as the second person in your group – make your decisions as an employer and as an employee. You will never find out with whom you have been matched.

The experiment consists of 2 stages:

Stage 1: In stage 1, each person playing as an **employer** chooses a **wage** for his/her employee.

Stage 2: In stage 2, each person playing as an **employee** chooses the **effort level** according to the procedure described below. As the employee at this moment is not aware yet of the decisions made by his/her employer in stage 1 (amount of wage), he/she can choose an effort level for every feasible amount of wage mentioned on the decision sheet. The employee will learn about every feasible wage and can decide which effort level he/she would like to achieve for each wage.

An employer's income depends on the wage paid and on the effort level provided. **An employee's income** depends on the wage received less the costs of the effort level provided. Below, you will find the exact procedure for calculating the income of employees and employers. After stage 2, the experiment will be over, and your income will already be determined. The preceding questionnaire will not affect your income.

How the labor market works

1. Two participants will be randomly assigned to each other. One will be the employer, and the other the employee. They will form a contract with each other.

2. No employer/employee will ever know with which employee/employer he/she has formed a contract.

3. Only after the end of the experiment the role of the employer and the employee will be randomly assigned. Therefore, each participant must make his/her decisions in the role of an employer as well as in the role of an employee.

4. In stage 1, each **employer** chooses a **wage** for his/her employee. **The employer can choose among 20, 40, 60, 80, and 100 Chips**. The employer records this wage on his/her decision sheet.

5. In stage 2, each **employer** chooses the **effort level** he/she would like to achieve according to the procedure described below. As the employee is not aware yet of the decisions made by his/her employer (amount of wage), he/she can choose an effort level for every feasible wage mentioned on the decision sheet. The employee thus learns about every feasible case and can decide on an effort level for each case.

6. After stage 2, all relevant labor market decisions will be made and with that, the income of the employer and the employee will be determined.

How does an employee calculate his/her income?

1. Every employer receives from the experimenter 120 coupons from which to pay wages to an employee. If the employer offers the employee a wage of 120 Chips, then the employer will have no income coupons left. If he/she offers the employee a wage of 20 Chips, then the employer will have 100 income coupons left. In general, the employer will have

120 Coupons – wage

income coupons left.

2. How are the remaining coupons converted into Chips? The number of coupons retained by the employer is multiplied by the effort level chosen by the employee. The result is the income of the employer in Chips. Thus:

Employer's Income (in Chips) = Coupons retained * Effort Level

How does an employee calculate his/her income?

1. Employees receive a wage from their employers. From this wage, the costs of the effort level chosen must be subtracted.

2. The employee determines his/her effort level by choosing a number between 0.1 and 1.0 from the schedule below. The lowest effort level he/she can choose is 0.1. The number 0.2 is a slightly higher number and therefore a higher level, and so on up to 1.0, the highest effort level.

3. The higher the effort level an employee chooses, the better it is for his/her employer because the employer's income will be higher.

4. The higher the chosen effort level, the higher the work-related costs will be. You can find out how these costs are related to effort levels by looking at the schedule below.

5. The income of an employee (in Chips) is determined by the following formula:

Income of the employee (in Chips) = Wage – Costs of Effort Level

6. The following table shows a schedule of possible Levels of Effort (LoE) and corresponding work-related costs to employees (Cost):

LoE	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**
Cost	**0**	**1**	**2**	**4**	**6**	**8**	**10**	**12**	**15**	**18**

Please note:

The income of all employees and employers will be calculated according to the same rules. Every employer has 120 coupons, and the work-related costs are the same for every employee. Every employer can calculate the income of "his/her" employee, and every employee can calculate the income of "his/her" employer.

A few exercises

We would like to ask you to solve the following exercises to become familiar with the decision situations of an employer and an employee.

1. Let us assume that the employer pays his/her employee a wage of 40 Chips. In response to this wage offer, the employee chooses an effort level of 0.2. How high is the income of the employer and the employee?

   Income of employer = _____Chips

   Income of employee = _____Chips

2. Let us assume that the employer pays his/her employee a wage of 20 Chips. In response to this wage offer, the employee chooses an effort level of 0.6. How high is the income of the employer and the employee?

   Income of employer = _____Chips

   Income of employee = _____Chips

3. Let us assume that the employer pays his/her employee a wage of 60 Chips. In response to this wage offer, the employee chooses an effort level of 0.1. How high is the income of the employer and the employee?

   Income of employer = _____Chips

   Income of employee = _____Chips

4. Let us assume that the employer pays his/her employee a wage of 80 Chips. In response to this wage offer, the employee chooses an effort level of 0.5. How high is the income of the employer and the employee?

   Income of employer = _____Chips

   Income of employee = _____Chips

5. Let us assume that the employer pays his/her employee a wage of 100 Chips. In response to this wage offer, the employee chooses an effort level of 0.9. How high is the income of the employer and the employee?

   Income of employer = _____Chips

   Income of employee = _____Chips

A further exercise

Please think about which choice rational employees and employers who want to maximize their self-interest would make.

As a reminder: The labor market works as follows. First, the employer decides on a wage, and then the employee chooses an effort level. Subsequently, the incomes are calculated (according to the following equations) and paid out.

Income of the Employee (in Chips) = Wage – Costs of Effort Level

Employees choose one of the possible Levels of Effort (LoE) from the first row of the schedule. The higher the number, the higher the level of effort will be. The second row of the schedule shows the costs of every effort level (Cost). The higher the level of effort, the higher the employee's costs.

LoE	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**
Cost	**0**	**1**	**2**	**4**	**6**	**8**	**10**	**12**	**15**	**18**

Coupons retained = 120 Coupons – Wage

Employer's Income (in Chips) = Coupons retained * Effort Level

1. **Which effort level would a rational employee choose who is set out to maximize his/her self-interest? 0.1, 0.2, 0.3, …, 0.9 and 1 are possible.**

   He/She chooses an effort level of …… .

2. **Which wage would a rational employer choose who is set out to maximize his/her self-interest and who anticipates the choice of his/her employee? 20, 40, 60, 80, and 100 Chips are possible.**

   He/She would choose a wage of …….. Chips.

Decision stage 1 for employers

Now it is your turn. The labor market is open.

As you do not know whether you will be randomly assigned to the role of the employer or employee, you will have to decide in both roles.

First, it is your job as an employer to determine the amount of your employee's wage. You have five wage possibilities to choose among: You can pay your employee a wage of 20, 40, 60, 80, or 100 Chips. **Please decide now**:

I will pay the employee a wage of

☐ ***20 Chips***

☐ ***40 Chips***

☐ ***60 Chips***

☐ ***80 Chips***

☐ ***100 Chips.***

Decision stage 2 for employees

In the second stage, you choose an effort level as an employee. If you are randomly assigned to the role of an employee, you will receive the wage chosen by the employer. However, you do not know the amount of the wage yet. The following shows five possible wages the employer was able to choose from. Please fill out which effort level you would like to achieve for each feasible wage:

1. Imagine your employer chose a wage **of 20.** Which effort level would you like to achieve in such a case?_____.
2. Imagine your employer chose a wage **of 40.** Which effort level would you like to achieve in such a case?_____.
3. Imagine your employer chose a wage **of 60.** Which effort level would you like to achieve in such a case?_____.
4. Imagine your employer chose a wage **of 80.** Which effort level would you like to achieve in such a case?_____.
5. Imagine your employer chose a wage **of 100.** Which effort level would you like to achieve in such a case?_____.

The experiment is finished now, and your income has been determined. Please wait for further instructions.

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