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## What makes us want to have more than others? Explaining relative consumption effects of public and private goods

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What Makes us Want to Have more than Others?  
Explaining Relative Consumption Effects of Public and  
Private Goods

by

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# What makes us want to have more than others? Explaining relative consumption effects of public and private goods

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December 2, 2010

## Abstract

We conduct a survey with 264 participants to test for relative consumption effects of national and local public goods as well as private goods. In contrast to previous results, we find that relative consumption effects are more pronounced for private goods than for public goods. Our second finding is that relative consumption effects are less pronounced for local public goods than for national public goods. We discuss and test different explanations for a good's degree of positionality and find that these can, in part, account for our results very well.

*Keywords: relative consumption, positional goods, public good spillovers, non-psychological costs*

*JEL: C91, D12, D62, D63*

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# 1 Introduction and related literature

In recent years, there has been a particular resurgence of scholarly interest in the phenomenon of relative consumption. Relative consumption effects occur if the relation between individual consumption and the amount consumed by others has an impact on individual utility. The first scholars to bring this topic to attention were Rae and Veblen in the 19th century and Duesenberry (1949) in the 20th century.<sup>1</sup> Frank (1985) illustrates analytically that if goods differ with respect to their degree of positionality, an underprovision of those goods characterized by lower positional concerns will result.<sup>2</sup> With regard to public good consumption, Ng (1987) argues that public goods do not exhibit positionality because, as they are, by definition, available to everybody, they do not offer an opportunity to stand out from the crowd. In line with Frank's findings, Ng concludes that a systematic underprovision of public goods may result.

Although many papers analyze relative income effects (e.g., Easterlin, 1974), there is a limited number of empirical studies to date that examine the relative consumption effects of different goods. Using survey data, Solnick and Hemenway (1998) examine students' concerns about individual standing with respect to several different aspects, including education, attractiveness, intelligence, income, and vacation time. Additional empirical studies include Johansson-Stenman et al. (2002), Alpizar et al. (2005), Solnick et al. (2007), and Carlsson et al. (2007).<sup>3</sup> A further study by Solnick and Hemenway (2005) also includes public goods. Surprisingly, Solnick and Hemenway find greater degrees of positionality for public than for private goods and bads. The present paper aims to examine this interesting finding by conducting another survey and thereby considering two different explanations.

First, we take a closer look at the attributes of the goods and bads investigated in our survey. In the spirit of Frank (2008), we differentiate between psychological and non-psychological costs that emerge due to relative consumption. One might immediately associate the term relative consumption with emotions such as envy and jealousy, which we will refer to here as psychological costs. In contrast, non-psychological costs can occur irre-

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<sup>1</sup>Veblen's "Theory of the Leisure Class" is available at Project Gutenberg; see Veblen (1997). Rae's original publication from 1834 has been reprinted under a new title; see Rae (1905).

<sup>2</sup>We envisage positional concern as the individual preference for consuming less from an absolute point of view, but relatively more than the reference group. This use of the term is in line with Solnick and Hemenway (1998, 2005) and Solnick et al. (2007) and originates from Frank (1985).

<sup>3</sup>While the first three studies also use student samples, the last one is based on a random sample of the Swedish population. All studies limit the analysis to income and a small number of additional goods (such as cars, housing, car safety, and leisure).

spective of whether an individual experiences such emotions: for example, having a worse education than the average person decreases one’s probability of finding a good job and therefore having a secure and high income in absolute terms. In the same way, lower government spending on national defense compared to that of other countries increases the probability of losing one’s life and property in a war.<sup>4</sup> In addition to non-psychological costs, we also take into account the fact that some of the public goods in consideration exert positive spillovers in the sense that the utility impact of these goods “reaches beyond the boundaries of the government that provides it” (Olson, 1969, p. 482). Consequently, individuals outside these boundaries will have access to these public goods as well. We expect non-psychological costs to increase the degree of a good’s positionality, and the presence of positive public good spillovers to decrease it.

Second, the participants’ country of origin may play an important role. The impact of cultural background and nationality on private good preferences has already been illustrated by Solnick et al. (2007), who find differing degrees of positionality for Chinese and US citizens’ preferences. Solnick and Hemenway’s survey (2005) was conducted in the US. As part of the World Values Survey, participants are asked how proud they are to be French, German, etc. Figure 1 depicts the shares of participants choosing the highest and lowest level of pride, using data from the 5th wave of the World Value Survey (2009). Obviously, the level of national pride is rather high in the US, while Germany is among those countries with the lowest levels of national pride. Empirical data on national identity from the International Social Survey Program and on national pride from former waves of the World Values Survey show very similar results (see, e.g., Shayo, 2009).

From social identity research, we know that group membership has an impact on political preferences (Klor and Shayo, 2010). Shayo (2009) shows that differences in national pride or patriotism can lead to differences in the level of redistribution. Thus, it is conceivable that patriotism may also affect preferences for public goods. Therefore, Germany may serve as an excellent survey location to at least provide an example of sample sensitivity. In order to derive a more detailed picture with respect to public goods, we explicitly distinguish between local and national public goods.

Our results are contrary to those found by Solnick and Hemenway (2005). We find that private goods are more positional than public goods. Adding a number of local public goods, which were not included in their sample, we provide evidence for the existence of

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<sup>4</sup>A formal definition of psychological and non-psychological costs will be provided in Section 3.2.

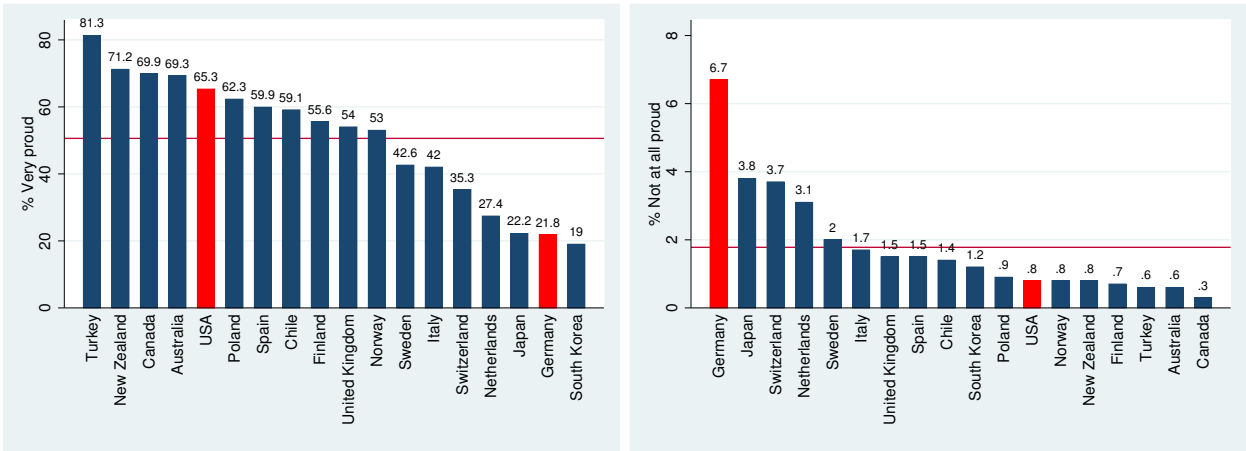


Figure 1: “How proud are you to be [Nationality]?”. World Value Survey, 2005-2008 wave. Left: “Very proud”. Right: “Not at all proud”.

more pronounced relative consumption effects for national public goods than for local public goods. However, taking into account the fact that consumption of some of the goods is accompanied by non-psychological costs or positive spillovers, we find that these influences are a good predictor of the extent of a good’s degree of positionality. Our regression results show that although the descriptive statistics indicate a significantly higher share of positional answers for private goods, this effect is mainly driven by non-psychological costs.

Our paper contributes to the body of literature on relative consumption as follows. First, there is no survey evidence for Germany illustrating status effects associated with consumption. Second, by contrasting our results with previous findings, we show that relative consumption preferences with regard to private and, in particular, public goods can differ between nations. The pronounced positionality effects for public goods found by Solnick and Hemenway (2005) may, at least in part, be country-driven: as their survey was conducted in the US, higher levels of patriotism may be a good explanation. Third, we show that the difference in the degree of positionality between private and public goods can be explained by non-psychological costs. However, distinguishing between local and national public goods, we find that local public goods are significantly less positional than private goods, even if we take into account spillover effects and non-psychological costs.

The paper is organized as follows. In Section 2, we describe the structure of our survey. Results are presented in Section 3. Finally, in Section 4 we conclude with regard to the impact of our findings.

## 2 Survey structure

Our methodology is closely related to that of Solnick and Hemenway (1998, 2005) and Solnick et al. (2007). Similar methodology is also used by Johansson-Stenman et al. (2002), Alpizar et al. (2005), and Carlsson et al. (2007). First, we used the two questionnaires developed by Solnick and Hemenway (2005), each including questions concerning 13 different goods. The main purpose of doing so was to determine whether the results of these questionnaires depend on the respondents' national background, as it may be plausible that the high public good positionality effects found by Solnick and Hemenway (2005) are driven by the fact that the study was conducted in the US. Second, we added five new questions to each of the two questionnaires in order to have a broader range of different local and national public goods. In total, the survey includes 36 different goods which were divided into two different questionnaires. Each respondent was asked to answer 18 questions.

The structure was the same for all questions and can be illustrated using the following example:

Below, there are two states of the world. You are asked to pick which of the two you would prefer to live in. If you do not have a preference, choose "I have no preference".

- Life expectancy in your country is 72 years; in other countries it is 80 years.
- Life expectancy in your country is 68 years; in other countries it is 60 years.
- I have no preference.

The first answer describes the absolute consumption (non-positional) scenario, whereas the second answer can be seen as a relative consumption (positional) scenario.<sup>5</sup> In addition to the 18 status questions, we collected some socio-economic data including age, gender, income, educational level, political preferences and whether participants have children and siblings.

The survey was conducted as a web survey. Similar to Solnick and Hemenway, we sent emails and Facebook messages to friends and colleagues, including a link to our survey. As described above, we had two questionnaires, each containing 18 different questions.<sup>6</sup> All questions were translated into German. In order to keep the translation as close to the

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<sup>5</sup>This format with regard to possible answers can also be found in all the studies cited above.

<sup>6</sup>The two questionnaires can be found in the Appendix, Section 5.

original as possible, these translations were retranslated into English again by a second translator and compared with the original questions as a test.

The tendency to choose the first answer simply because it is presented first was accounted for in two different ways. First, both questionnaires consisted of nine questions beginning with the positional scenario and nine questions beginning with the non-positional scenario. Second, we used two versions of each questionnaire, with the second version featuring all answers arranged in reverse order. After participants had chosen their language (German or English), they were randomly allocated one of the four questionnaire versions.

In total, 264 participants completed the questionnaire. 38 percent of the participants were female, and 65 percent of the sample was aged between 20 and 29. 57 percent of the participants claimed to have an income between €20,000 and €60,000, while 58 percent of the sample reported that a university degree was their highest educational attainment. Detailed descriptive statistics are provided in Table 5 in the Appendix.

## 3 Results

### 3.1 Descriptive results

For the interpretation of our results, we divide the different goods into six groups: private goods and bads, local public goods and bads, and national public goods and bads. The descriptive statistics are shown in Tables 1 and 2. We find that the degree of positionality – approximated by the share of positional answers – is higher for private goods and bads than for public goods and bads. While private goods and bads on average have a share of positional answers of 25 percent, the average share of positional answers for public goods and bads is only 21 percent. This difference is statistically significant ( $p = 0.0006$  in within-subject t-test).

With regard to public goods and bads, Table 1 illustrates that both spending on national defense and spending on space exploration are characterized by a large share of positional answers. The other public goods and bads show only limited positionality effects (at most 24 percent of answers are positional). Our results contrast with those of Solnick and Hemenway (2005): we find a smaller share of positional answers for every single public good and bad analyzed in their survey. On average, the share of positional answers for these public goods and bads is about 14 percentage points smaller in our survey. Hence, the country effect



	Percentage of Responses	
	Positional	Non-positional
<b>Local Public Goods</b>		
Playgrounds in neighborhood	9	75
Doctor's offices in community	14	80
Hospital beds in community	9	85
Fire fighters in community	9	75
Police officers in police station	19	63
Average	12	76
<b>Local Public Bads</b>		
Potholes in neighborhood	6	78
Unhealthy air quality in community	10	87
Average	8	83
<b>National Public Goods</b>		
National defense spending (\$25 billion vs. \$10 billion)	62	19
National defense spending (\$250 billion vs. \$100 billion)	73	18
National park spending	25	58
Foreign aid spending	22	64
Space exploration spending	45	29
National life expectancy	6	84
Basic health research spending	14	80
Average	35	50
<b>National Public Bads</b>		
National infant mortality	4	87
National poverty rate	9	89
Average	7	88
All public goods and bads – average	21	67

Notes: Results do not total 100 because some respondents chose “both”

Table 1: Public goods: responses by type of good.

discussed above seems to be highly relevant.

Table 1 shows that local public goods are characterized by less pronounced relative consumption effects than national public goods. The share of positional answers is on average about 23 percentage points higher for national than for local public goods. The difference is statistically significant ( $p < 0.0001$  in within-subject t-test). Our results show that participants preferred a higher absolute availability of playgrounds, police officers, fire fighters, hospital beds, and doctor's offices over having more than other communities. One may ques-

tion the purity of these local public goods: a single fire fighter, for example, can only take care of only fire at a time. Nevertheless, facilities such as a fire station, a police station, or a hospital, which render assistance in the case of an emergency, can be interpreted as public goods.<sup>7</sup>

	Percentage of Responses	
	Positional	Non-positional
<b>Private Goods</b>		
Personal income (\$50,000 vs. \$100,000)	24	70
Personal income (\$200,000 vs. \$400,000)	44	49
Outfit for job interviews	41	28
Restaurant meals	31	47
Weeks of vacation	13	84
Flowers in home	19	44
Rooms in home	30	43
Years of education	34	47
Hotel quality in vacations	11	72
Car value	16	69
Cinema visits	22	47
Company car value	33	40
Hours studying for a test	64	23
Hours training for athletic competition	50	17
Average	31	46
<b>Private Bads</b>		
Days of illness	13	79
Length of commute	10	63
Child's unsatisfactory grades	26	60
Unpleasant dental procedures	5	88
Days working overtime	14	74
Car broken into	4	90
Average	12	76
All private goods and bads – average	25	56

Notes: Results do not total 100 because some respondents chose "I have no preference".

Table 2: Private goods: responses by type of good.

Table 2 illustrates that many private goods are characterized by a high degree of positionality. The most pronounced effects can be found for the time spent studying for a test and

<sup>7</sup>For a discussion of the public good character of hospital beds and other medical services, see Zweifel et al., 2009, p. 159.

training for an athletic competition, as well as for personal income, outfit for job interviews and years of education.

Looking at personal income and cars, we obtain interesting results: confronted with relatively small levels of personal income (\$50,000 in the positional scenario vs. \$100,000 in the non-positional scenario), only 24 percent of the participants chose the positional scenario. In contrast, when participants are confronted with relatively high levels of income, this result changes. When deciding between \$200,000 in the positional scenario and \$400,000 in the non-positional scenario, 46 percent of the participants chose the positional scenario. This result may be explained by a saturation effect: if income exceeds a certain individual threshold, the relative scenario becomes more attractive than the absolute scenario. For many of the survey participants, this individual threshold may lie between \$50,000 and \$200,000. The same can be observed in the case of cars. The survey includes two car questions, one question regarding a privately owned car with low car values, and a second one featuring a company car with high car values. In line with the results for income, we find that only 15 percent of the participants chose the positional scenario for the private car, whereas 33 percent chose the positional scenario for the company car.

For other private goods and bads, such as the number of unpleasant dental procedures, car break-ins, hotel quality and weeks of vacation, we only find limited positionality effects. One reason may be that consumption levels of these goods and bads cannot be easily observed by others. A person with three weeks of vacation may look more relaxed than a person with only one week of vacation; likewise, an individual on his way to the dentist may look rather unhappy. However, if others' consumption levels of certain goods are difficult or even impossible to observe, positional concerns regarding these goods may simply not occur.<sup>8</sup>

We find stronger relative consumption effects for goods than for bads, which is in line with findings in the previous literature. This holds in aggregate as well as in comparison between private goods and bads, local public goods and bads, and national public goods and bads. We find the clearest difference in the case of private goods (26.7 percent positional answers) and private bads (11.8 percent positional answers). These findings may be rooted in different individual preferences regarding gains and losses, which are discussed by Tversky and Kahnemann (1991), for example.

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<sup>8</sup>For a brief discussion of the influence of observability on relative consumption, see Frank (1985), Alpizar et al. (2005), and Carlsson et al. (2007).

### 3.2 Why are some goods more positional than others?

The findings in the previous section show that the share of positional answers is highest for private goods, intermediate for national public goods, and lowest for local public goods. The following section aims to ascertain whether other properties have an impact on the share of positional answers as well. Specifically, we distinguish between psychological and non-psychological costs resulting from relative consumption, a distinction that was recently established by Frank (2008) and is outlined in the following definitions:

**Definition 1** *Psychological costs: Psychological costs are costs that can be ascribed to the fact that the relation between consumption levels of different groups or individuals directly enters the utility function.*

**Definition 2** *Non-psychological costs: Non-psychological costs are costs that are caused by a negative consumption externality but cannot be ascribed to the fact that the relation between consumption levels of different groups or individuals directly enters the utility function.*

To illustrate the rationale behind the definitions, we provide the following example, in which we refer to individuals  $A$  and  $B$ .  $A$ 's utility function takes the following basic form::

$$u_A = \alpha \cdot v(c_A) + \beta \cdot f(c_A, c_B) + \gamma \cdot p_A(c_A, c_B)z. \quad (1)$$

$v(c_A)$  denotes the utility individual  $A$  directly derives from consuming  $c_A$ ,  $\frac{\partial v}{\partial c_A} > 0$ ;  $f(c_A, c_B)$  is  $A$ 's utility derived from directly comparing his consumption level with the consumption of individual  $B$ ,  $\frac{\partial f}{\partial c_A} > 0$ ,  $\frac{\partial f}{\partial c_B} < 0$ , and  $p_A$ ,  $0 < p_A < 1$ , denotes the probability of gaining utility from the consumption of an additional good  $z$  (monetary or non-monetary),  $\frac{\partial p_A}{\partial c_A} > 0$ ,  $\frac{\partial p_A}{\partial c_B} < 0$ .  $\alpha \geq 0$ ,  $\beta \geq 0$ , and  $\gamma \geq 0$  are weighting factors.

$c_k$ ,  $k = A, B$ , could denote the value of  $k$ 's car, for example. Traditional microeconomic theory assumes that only the value of  $A$ 's car but not the value of  $B$ 's car will enter  $A$ 's utility function ( $\alpha > 0; \beta, \gamma = 0$ ). In such a setting, the purchase of a fast sports car by  $B$  will not change  $A$ 's utility. However,  $B$ 's purchase of the fast sports car will decrease  $A$ 's utility if his utility function also depends on the relation between the value of his own car and the value of  $B$ 's car ( $\alpha, \beta > 0; \gamma = 0$ ). Comparing the cars will then entail psychological costs for individual  $A$ . In addition, one could imagine that both individuals participate in a car race using their private cars. In this case,  $B$ 's purchase of the fast sports car will lower

$A$ 's probability  $p_A$  of winning the car race and attaining utility from  $z$ , which could either capture some sort of trophy money (monetary) or simply being the winner (non-monetary). Thus, even if the relation between the respective car values does not directly enter  $B$ 's utility function ( $\alpha, \gamma > 0; \beta = 0$ ),  $A$ 's utility level will decrease due to non-psychological costs.

Clearly, psychological costs may be explained by emotions such as envy or jealousy, whereas non-psychological costs can also affect individuals who are not typically jealous at all. A similar distinction to that between psychological and non-psychological costs has been drawn by Postlewaite (1998), who argues that while social status can itself be utility-enhancing, it can also serve as an instrument to achieve a greater amount of consumption in absolute terms.

Looking at some of the goods investigated in this survey, such as training for a sports competition or studying for an exam, one can clearly identify non-psychological costs. An increase in individual  $A$ 's preparation time for an athletic competition leads, *ceteris paribus*, to a decrease in individual  $B$ 's probability of winning the competition and the trophy money attached to a victory. It is likely that an increase in individual  $A$ 's time spent studying for a test will decrease the possibility of individual  $B$  doing better than individual  $A$  in the test and, therefore, possibly affect  $B$ 's chances of finding a good job in the future. The same holds for national defense expenditures: spending more on national defense than other countries increases the probability of not losing one's life and property in a war. Some goods may, of course, simultaneously entail psychological costs as well as non-psychological costs: returning to the car example, one can imagine that the two neighbors might participate in a car race but also care about the relation between the respective values of their cars ( $\beta, \gamma > 0$ ). Column 2 in Table 3 outlines which of the goods investigated in the present survey may entail non-psychological costs. We suggest that these goods have a larger share of positional answers.

Additionally, we factor in that some of the public goods included in this survey are characterized by positive spillover effects (see, e.g., Olson, 1969), which may also have an impact on the share of positional answers. For example, in the event of a large fire in community  $C$ , the fire fighters employed in the local fire department of the neighboring community  $D$  can help their colleagues in community  $C$  to fight the fire. Thus, the number of fire fighters employed in a community exerts a positive externality on the surrounding communities. The same holds for the number of hospital beds and doctor's offices. Column 1 of Table 3 illustrates which of the public goods investigated in this paper may be associated

	Positive spillovers	Non-psychological costs
<b>National Public Goods</b>		
National defense		X
National parks	X	
Foreign aid	X	
Space exploration		X
Basic health research	X	
<b>Local Public Goods</b>		
Playgrounds in neighborhood	X	
Doctor's offices in community	X	
Hospital beds in community	X	
Fire fighters in community	X	
Police officers in police station	X	X
<b>Local Public Bads</b>		
Potholes in neighborhood	X	
Unhealthy air quality in community	X	
<b>Private Goods</b>		
Outfit for job interviews		X
Years of education		X
Hours studying for a test		X
Hours training for athletic competition		X

Table 3: Positive public good spillovers and non-psychological costs for the goods investigated

with positive spillover effects. We suggest that these public goods will have a smaller share of positional answers.

With respect to the public goods and bads studied in our analysis, we suppose ten to have positive spillover effects, and we assume eight public and private goods to entail non-psychological costs. We identify seven goods and bads for which it may be debated whether they are accompanied by positive spillover effects or non-psychological costs. However, we conduct numerous robustness checks which involve switching the classification of one or two of those goods and bads for which classification is ambiguous. These will be discussed in more detail after presenting the basic results.

Within the following, we refer to the basic specification shown in Table 3. First, we calculate the correlation coefficients between dummy variables that take the value of 1 whenever a good or bad is characterized by positive spillovers or by non-psychological costs, and 0 otherwise. The correlation between the positive spillover effect dummy variable and the share

of positional answers for each good is  $-.3371$  and statistically significant at the 5% level. Hence, where positive spillovers were present, the participants were less likely to choose the positional answer. The correlation coefficient between the non-psychological costs dummy variable and the share of positional answers emerges as  $.7552$  and is statistically significant at the 1% level. Non-psychological costs are accompanied by a larger share of positional answers.

To check whether the difference in the share of positional answers between private and public goods remains robust when positive spillovers and non-psychological costs are taken into account, we estimate the following equation:

$$\begin{aligned} \text{share of positional answers}_j = & \alpha_0 + \alpha_1 \text{positive spillover}_j + \alpha_2 \text{non-psychological costs}_j \\ & + \alpha_3 \text{public good}_j + \epsilon_j, \end{aligned} \quad (2)$$

with *share of positional answers<sub>j</sub>* being the share of positional answers for good  $j$ ,  $j = 1, \dots, 36$  and *public good<sub>j</sub>*, *positive spillover<sub>j</sub>*, and *non-psychological costs<sub>j</sub>* being dummy variables that take the value of 1 whenever a good or bad fits into the respective category and 0 otherwise. The results of our OLS regression with robust standard errors are shown in Table 4. We find that there is no significant public good effect on the share of positional answers. However, we do find a positive and highly significant effect for non-psychological costs: a good which entails non-psychological costs is accompanied by share of positional answers that is 31 percentage points higher. The positive spillover dummy variable's coefficient has the expected sign but remains statistically insignificant.

Thus, the first result of the regression analysis taking into account non-psychological costs of consumption is that these costs can, to a large extent, explain the differences in positional answers. There is no longer a significant difference between private and public goods with respect to the share of positional answers.

Having differentiated between local and national public goods and bads, we estimate the following equation, employing different dummy variables for the former and latter respectively (with private goods and bads as the reference group):

$$\begin{aligned} \text{share of positional answers}_j = & \alpha_0 + \alpha_1 \text{positive spillover}_j + \alpha_2 \text{non-psychological costs}_j \\ & + \alpha_3 \text{local public good}_j + \alpha_4 \text{national public good}_j + \epsilon_j. \end{aligned} \quad (3)$$

	(2)	(3)
Positive spillover	-7.64762 (-1.05)	2.48329 (0.37)
Non-psychological cost	31.21429*** (4.97)	31.96658*** (5.34)
Public good	-0.78095 (-0.12)	
Local public good		-15.04949** (-2.04)
National public good		-1.00664 (-0.16)
Constant	19.00714*** (6.53)	18.85668*** (6.45)
R <sup>2</sup>	0.61	0.65
N	36	36

Table 4: Estimations of equations (2) and (3)

Table 4 also shows the OLS regression results for the estimation of (3). We still find a highly significant non-psychological cost effect: the share of positional answers is around 32 percentage points larger if the good is associated with non-psychological costs. While the results of the estimation of (2) show no significant public good effect, this is not the case here: local public goods and bads emerge as less positional than private goods and bads. With respect to national public goods and bads, we do not find a significant effect. It may, in addition, be interesting to investigate whether private and public goods differ with respect to their positive spillover and non-psychological costs effects. However, given the small number of goods in our sample, we do not apply interaction terms here.

To briefly summarize, when taking into account positive public good spillovers and non-psychological costs, we find significant positionality differences only between local public goods and private goods. Local public goods are characterized by a significantly smaller share of positional answers. There is no statistically significant difference between the whole group of public goods and bads and private goods and bads when the spillover and costs dummy variables are included. Hence, it may be the case that public and private goods and bads do not necessarily differ with respect to their relative consumption effects because they are public or private goods and bads, but because they are associated with different forms of the externalities discussed above. Evidence for this interpretation can be found when, for example, considering only private goods. Within the group of 20 private goods investigated here, four exhibit non-psychological costs. The share of positional answers (absolute answers)



is strongly positively (negatively) correlated with the existence of non-psychological costs.

As stated above, for a group of seven goods and bads there might be some uncertainty as to whether they are accompanied by positive spillover effects or non-psychological costs. We conducted a number of robustness checks by sequentially switching one or two of these goods' classification. In total, we re-estimated equations (2) and (3) 61 times, changing one or two of the respective goods' classifications at a time. The effect of the existence of non-psychological costs on positionality did not change once for both equations (2) and (3). However, the coefficient of the local public good dummy variable became insignificant (yet retained the same sign) in about 24% of the cases. Nevertheless, these results seem to be relatively robust, given that our analysis includes only seven local public goods and bads.<sup>9</sup>

Interestingly, we find the same pattern when using the share of positional answers obtained by Solnick and Hemenway (2005) as a dependent variable: the statistically significant difference between the positionality of public and private goods disappears. In addition, the coefficient of the non-psychological costs dummy variable emerges as highly significant.

### 3.3 Trying to explain individual attitudes

As mentioned above, we asked the participants for some information concerning their socio-economic background. To check whether we can explain their answers using these socio-economic variables, we run a probit estimation with robust standard errors for each question, estimating the following model

$$\text{positional}_{iq} = \alpha + \beta_{\chi} \cdot \mathbf{control}_{\chi i} + \epsilon_{iq}, \quad (4)$$

with participant  $i$ , question  $q$ , control variable  $\chi$ , and  $\mathbf{control}_{\chi i}$  as a vector of control variables. The dummy variable  $\text{positional}_{iq}$  is equal to 1 in the case of a positional answer and 0 otherwise. For each question, we included the following control variables: income, age, education level, gender, whether participants had children and siblings respectively, and party preference.<sup>10</sup>

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<sup>9</sup>If we change two out of the seven classifications with respect to non-psychological costs or positive spillover effects, it is straightforward that some of the effects will change. Hence, as the non-psychological costs dummy variable's coefficient remains highly statistically significant in all cases, we conclude that our results are rather robust.

<sup>10</sup>In order to obtain a proxy for party preference, we asked the participants which party list they voted for in the last elections to the German Bundestag, 2009.

The results show that we cannot identify a single control variable which has a significant impact on all (or at least most) decisions. There are, in contrast, some goods where none of these control variables has a significant coefficient, namely the choices concerning fire fighters, street quality, expenditures for space exploration, the value of the private car, and the number of car break-ins. However, we find at least some significant coefficients for the other questions.

To check whether relative consumption preferences for different groups of goods can be explained by socio-economic variables, we additionally estimated the following equation

$$\text{share positional}_{ig} = \alpha + \beta_{\chi} \cdot \mathbf{control}_{\chi i} + \epsilon_{ig}, \quad (5)$$

with participant  $i$ , group of goods and bads  $g$ ,  $g = \{\textit{private}, \textit{local public}, \textit{national public}\}$ , control variable  $\chi$ ,  $\mathbf{control}_{\chi i}$  as a vector of control variables, and  $\text{share positional}_{ig}$  as the share of positional answers given by individual  $i$  for the group of goods  $g$ .

We estimated the model using OLS and provide the results in Table 6 in the Appendix. Individual age and education level emerge as important for the participants' relative consumption preferences. The higher the educational level, the less likely it is that positional preferences for local and national public goods and bads exist. We find participants' age to have significant effects on positionality. Older people tend to have stronger relative consumption preferences for private and national public goods and bads, but prefer to have a higher level of local public goods and bads in absolute terms.

Personal income, gender, and having siblings do not have any influence on individual answers. The same holds for having children, except for a significantly smaller share of "no preference" answers with respect to national public goods and bads. The political variables mainly turn out to be insignificant, although CDU/CSU voters prefer higher levels of private and national public goods and bads in absolute terms and are less likely to have "no preference" for all three groups of goods and bads.

## 4 Conclusion

Using an online survey, we asked participants to decide whether they want to live in a world where they have a relatively small consumption level of a specific good, but more than others around them, or in a world where they consume more in absolute terms (in comparison to the

other scenario), but have less than others. We find considerable evidence for the existence of relative consumption effects. Moreover, their magnitude differs for different goods and bads. First, we find considerably more pronounced positionality effects for private than for public goods and bads in general. Second, we find that positionality plays a larger role for national than for local public goods and bads. The first result, in particular, sharply contrasts with Solnick and Hemenway's (2005) findings, which suggest more pronounced status effects for public goods and bads than for private goods and bads. The difference in the results may be due to differing levels of national pride. Empirical data on national pride from the WVS show that patriotism is particularly strong in the US, where Solnick and Hemenway's study was conducted, and rather weak in Germany, where our study took place. Since, as illustrated by Shayo (2009) and Klor and Shayo (2010), national pride can shape political preferences, national pride may also provide the appropriate explanation for the contrasting findings in this paper.

However, when taking into account public good spillover effects and non-psychological costs as identified by Frank (2008), our regression results show that there is no statistically significant difference between the positionality for private and public goods and bads respectively. We find that the existence of non-psychological costs is a good predictor of a higher share of positionality. When distinguishing between local and national public goods and bads, our regression results indicate less pronounced relative consumption effects for local public goods and bads than for private goods and bads, whereas the difference in the positionality for private and national public goods and bads respectively is statistically insignificant.

An important question for future research is whether individuals choose the positional scenario due to relative consumption preferences or because their preferences are not monotonic, implying that consuming less of a certain good may be better than more. For example, with respect to national defense spending, one could argue that a pacifist chooses the positional scenario due to a desire to minimize aggregate military expenditures. In order to separate relative consumption preferences from interests like these, survey participants could be divided into a control and a treatment group. While the control group would only have to choose between two different levels of consumption, the treatment group would be provided with information about others' consumption levels. Furthermore, it would be interesting to shed some light on the composition of reference groups. Easterlin (1974) noted that the income levels of other people in the same country is more important for individual happi-

ness than the income level of people in other countries. An obvious explanation for this observation could be that reference groups mainly consist of individuals from the surrounding environment. In order to examine this theory, a similar survey could be conducted with varying reference groups (for example, direct neighbors, inhabitants of other communities, inhabitants of other countries). Moreover, one could design settings where survey participants have to make choices regarding one private good – with their neighbors as a reference group – and one public good – with a broader reference group comprised of other communities or other countries.

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## 5 Appendix

### Statistics

Percentage of participants	
<b>Gender</b>	
Female	37.9%
Male	62.1%
<b>Age</b>	
20 – 29	65.2%
30 – 39	14.4%
40 – 49	9.1%
50 – 59	8.7%
60 – 69	1.5%
> 69	0.4%
<b>Yearly income</b>	
≤€ 20,000	16.3%
€ 20,001-€ 40,000	23.5%
€ 40,001-€ 60,000	33.3%
>€ 60,000	22.4%
<b>Highest educational qualification</b>	
<i>Haupt-/Realschulabschluss</i>	0.8%
Completed apprenticeship/ <i>Abitur</i>	30.7%
University degree	57.6%
Doctoral degree/habilitation	5.3%
Other	3.8%

Table 5: Descriptive statistics.

	Private Goods&Bads			Local Public Goods&Bads			National Public Goods&Bads		
	Abs	Pos	No	Abs	Pos	No	Abs	Pos	No
Income	-.0002661 (-0.43)	.0001797 (0.37)	.0000864 (0.12)	.0000935 (0.18)	-.0005142 (-1.11)	.0004207 (1.08)	-.0003743 (-0.52)	-.0004291 (-0.68)	.0008035 (1.22)
Education	-.0006644 (-0.57)	.0009697 (1.01)	-.0003053 (-0.23)	.0044093*** (3.15)	-.004014*** (-4.17)	-.0003953 (-0.40)	.0051808*** (3.64)	-.0027769** (-2.07)	-.0024038** (-2.35)
Age	-.0001758 (-0.25)	.001432*** (2.88)	-.0012562 (-1.48)	.0031712*** (3.63)	-.0014446*** (-2.74)	-.0017266*** (-2.59)	-.0042371*** (-5.39)	.0025386*** (3.46)	.0016985*** (2.99)
CDU/CSU party	.0798922** (1.99)	.0109031 (0.34)	-.0907953** (-2.16)	.0454713 (1.05)	.0463363 (1.53)	-.0918076*** (-3.10)	.0878409* (1.85)	.0758976* (1.75)	-.1637385*** (-3.73)
SPD party	.0077379 (0.18)	-.0011977 (-0.03)	-.0065402 (-0.14)	-.029772 (-0.54)	.0229366 (0.62)	.0068354 (0.16)	-.0172947 (-0.31)	.0960857* (1.95)	-.078791 (-1.52)
FPD party	.0347207 (0.85)	.0267128 (0.75)	-.0614335 (-1.45)	-.068949 (-1.23)	.0620157* (1.75)	.0069333 (0.17)	.0827538* (1.68)	.0134901 (0.31)	-.0962439* (-1.90)
Linke party	-.0147767 (-0.24)	-.0227921 (-0.42)	.0375688 (0.50)	-.0647558 (-0.63)	-.0222698 (-0.44)	.0870256 (0.84)	.016863 (0.23)	.1078252 (1.07)	-.1246883 (-1.64)
Grüne party	.0331921 (0.80)	-.0530435 (-1.55)	.0198514 (0.45)	-.079512 (-1.64)	.0265054 (0.81)	.0530066 (1.28)	.0598091 (1.21)	.0504248 (1.14)	-.1102339** (-2.35)
Female	-.0292406 (-1.11)	.0162261 (0.77)	.0130145 (0.49)	.000164 (0.01)	.0036232 (0.16)	-.0037872 (-0.16)	.01141 (0.39)	-.0393443 (-1.42)	.0279343 (1.04)
Children	-.0220385 (-0.74)	-.0189307 (-0.79)	.0409692 (1.39)	-.006139 (-0.17)	.0003082 (0.01)	.0058308 (0.22)	.0075666 (0.23)	.0558099* (1.92)	-.0633765** (-2.57)
Siblings	-.0182065 (-0.59)	-.0192299 (-0.76)	.0374364 (1.27)	.0138851 (0.37)	.0003052 (0.01)	-.0141902 (-0.51)	.03 (0.81)	-.0311361 (-1.13)	.0011361 (0.04)
Constant	.562641*** (13.76)	.2608524*** (7.54)	.1765058*** (3.99)	.7745885*** (16.95)	.0908312*** (2.94)	.1345803*** (3.71)	.4919764*** (9.93)	.2774269*** (7.13)	.2305966*** (4.57)
R <sup>2</sup>	0.03	0.04	0.07	0.08	0.06	0.08	0.05	0.06	0.09

OLS Regression with robust standard errors. Dependent variable: individual share of absolute/positional/no preference answers. Abs=absolute scenario, Pos=positional scenario, No=no preference. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.

Table 6: Influence of socioeconomic factors on individual decisions.



## Survey questions

### Questionnaire 1:

Below, there are two states of the world. You are asked to pick which of the two you would prefer to live in. If you do not have a preference, choose “I have no preference”.

1. (a) You have a 30 minute commute to work and other people have a 45 minute commute.  
(b) You have a 20 minute commute to work and other people have a 10 minute commute.  
(c) I have no preference. (Henceforth dropped in this list)
2. (a) Air quality in your community is unhealthy 4 days a month; in other communities 2 days a month.  
(b) Air quality in your community is unhealthy 6 days a month; in other communities 8 days a month.
3. (a) Infant mortality in your country is 6 per 1,000; in other countries it is 4 per 1,000.  
(b) Infant mortality in your country is 8 per 1,000; in other countries it is 11 per 1,000.
4. (a) Your government spends €167 billion on national defense; other countries spend €267 billion.  
(b) Your government spends €60 billion on national defense; other countries spend €40 billion.
5. (a) Your car is broken into twice this year; other people’s cars are broken into four times.  
(b) Your car is broken into once this year; other people’s cars are not broken into.
6. Note that prices are what they are currently and prices (the purchasing power of money) are the same in states a and b.  
(a) Your current yearly income is €267,000; others earn €533,000.

- (b) Your current yearly income is €133,000; others earn €67,000.
7. (a) You have 9 days of illness every winter; others have 12 days of illness.  
(b) You have 6 days of illness every winter; others have 2 days of illness.
8. (a) You have 4 weeks of vacation; others have 8 weeks.  
(b) You have 2 weeks of vacation; others have 1 week.
9. (a) Life expectancy in your country is 72 years; in other countries it is 80 years.  
(b) Life expectancy in your country is 68 years; in other countries it is 60 years.
10. (a) You spend 15 hours studying for a test; other people spend 10 hours.  
(b) You spend 20 hours studying for a test; other people spend 25 hours.
11. (a) You have flowers in your home once a week; others do not have flowers.  
(b) You have flowers in your home twice a week; others have flowers every day.
12. (a) You have a €133 outfit to wear to job interviews; other people have €67 outfits.  
(b) You have a €267 outfit to wear to job interviews; other people have €400 outfits.
13. (a) Your government spends €8 billion on space exploration; other countries spend €10.7 billion.  
(b) Your government spends €5.3 billion on space exploration; other countries spend €4 billion.
14. (a) Your community has 60 hospital beds per 10,000 inhabitants; other communities have 100 hospital beds per 10,000 inhabitants.  
(b) Your community has 40 hospital beds per 10,000 inhabitants; other communities have 20 hospital beds per 10,000 inhabitants.
15. (a) You own a car worth €20,000; others own a car worth €30,000.  
(b) You own a car worth €10,000; others own a car worth €5,000.
16. (a) Your community employs 8 fire fighters; other communities employ 6 fire fighters.

- (b) Your community employs 10 fire fighters; other communities employ 15 fire fighters.
- 17. (a) During your vacation in Spain you stay in a 3 star hotel; others stay in a 2 star hotel.
- (b) During your vacation in Spain you stay in a 4 star hotel; others stay in a 6 star hotel.
- 18. Note that people are considered to be poor when they have less than half of the per-capita income and that per-capita income is the same in both worlds.
- (a) In your country, 6% of the inhabitants are poor; in other countries, 8% of the inhabitants are poor.
- (b) In your country, 4% of the inhabitants are poor; in other countries, 2% of the inhabitants are poor.

Questionnaire 2:

- 1. (a) Your home has 7 rooms; other people's homes have 10 rooms.
- (b) Your home has 5 rooms; other people's homes have 3 rooms.
- 2. Note that prices are what they are currently and prices (the purchasing power of money) are the same in states a and b.
- (a) Your current yearly income is €33,300; others earn €16,700.
- (b) Your current yearly income is €66,700; others earn €133,300.
- 3. (a) Your government spends €4 billion on foreign aid; other countries spend €6.7 billion.
- (b) Your government spends €1.3 billion on foreign aid; other countries spend €0.7 billion.
- 4. (a) Your government spends €3.3 billion on national parks; other countries spend €1.3 billion.
- (b) Your government spends €5.3 billion on national parks; other countries spend €7.3 billion.
- 5. (a) You usually have to work overtime once a week; others do not usually have to work overtime.

- (b) You usually have to work overtime three days a week; others usually have to work overtime every day.
- 6. (a) You need 2 unpleasant dental procedures; others need 4 unpleasant dental procedures.
  - (b) You need 1 unpleasant dental procedure; others do not need any dental work.
- 7. (a) You have 12 years of education (high school); others have 8.
  - (b) You have 16 years of education (college); others have 20 (graduate degree).
- 8. (a) Streets in your community have 2 potholes per mile; streets in other communities have 1 pothole per mile.
  - (b) Streets in your community have 3 potholes per mile; streets in other communities have 4 potholes per mile.
- 9. (a) Your community has 3 playgrounds; other communities have 5 playgrounds.
  - (b) Your community has 2 playgrounds; other communities have 1 playground.
- 10. (a) Your government spends €18.7 million on basic health research; other countries spend €13.3 million.
  - (b) Your government spends €24 million on basic health research; other countries spend €28 million.
- 11. (a) You eat out at a nice restaurant 4 times per month; others eat out once a month.
  - (b) You eat out at a nice restaurant 8 times per month; others eat out 12 times per month.
- 12. (a) Your child has 2 unsatisfactory grades; other people's children have 1 unsatisfactory grade.
  - (b) Your child has 3 unsatisfactory grades; other people's children have 4 unsatisfactory grades.
- 13. (a) You spend 100 hours training for an athletic competition; other people spend 50 hours.

- (b) You spend 150 hours training for an athletic competition; other people spend 200 hours.
- 14. (a) Your community has 5 doctor's offices per 10,000 inhabitants; other communities have 7 doctor's offices per 10,000 inhabitants.
  - (b) Your community has 4 doctor's offices per 10,000 inhabitants; other communities have 2 doctor's offices per 10,000 inhabitants.
- 15. (a) You drive a company car worth €45,000; others drive a company car worth €90,000.
  - (b) You drive a company car worth €30,000; others drive a company car worth €25,000.
- 16. (a) Your community's police station employs 8 police officers, other communities' police stations employ 6 police officers.
  - (b) Your community's police station employs 10 police officers, other communities' police stations employ 15 police officers.
- 17. (a) You go to the movies 2 times a month; others go to the movies 1 time per month.
  - (b) You go to the movies 3 times a month; others go to the movies 4 times per month.
- 18. (a) Your government spends €\$25 billion on national defense; other countries spend €\$40 billion.
  - (b) Your government spends €\$10 billion on national defense; other countries spend €\$6 billion.