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Inflation Concerns and Green Product Consumption: Evidence from a Nationwide Survey and a Framed Field Experiment

Sabrina Jeworrek, Lena Tonzer

Authors

Sabrina Jeworrek

Otto von Guericke University Magdeburg and
Halle Institute for Economic Research (IWH) –
Member of the Leibniz Association,
Department of Laws, Regulations and Factor
Markets
E-mail: sabrina.jeworrek@iwh-halle.de
Tel +49 345 7753 730

Lena Tonzer

Otto von Guericke University Magdeburg and
Halle Institute for Economic Research (IWH) –
Member of the Leibniz Association,
Department of Financial Markets
E-mail: lena.tonzer@iwh-halle.de
Tel +49 345 7753 835

Editor

Halle Institute for Economic Research (IWH) –
Member of the Leibniz Association

Address: Kleine Maerkerstrasse 8
D-06108 Halle (Saale), Germany
Postal Address: P.O. Box 11 03 61
D-06017 Halle (Saale), Germany

Tel +49 345 7753 60
Fax +49 345 7753 820

www.iwh-halle.de

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Inflation Concerns and Green Product Consumption: Evidence from a Nationwide Survey and a Framed Field Experiment*

Abstract

Promoting green product consumption is one important element in building a sustainable society. Yet green products are usually more costly. In times of high inflation, not only budget constraints but also the fear that prices will continue to rise might dampen green product consumption and, hence, limit the effectiveness of exerted efforts to promote sustainable behaviors. To test this suggestion, we conducted a Germany-wide survey with almost 1,200 respondents, followed by a framed field experiment (N=500) to confirm causality. In the survey, respondents' stated "green" purchasing behavior is, as to be expected, positively correlated with concerns about climate change. It is also negatively correlated with concerns about future inflation and energy costs, but after controlling for observable characteristics such as income and educational level only the correlation with concerns about future prices remains significant. This result is driven by individuals with below-median environmental attitude. In the framed field experiment, we use the priming method to manipulate the saliency of inflation concerns. Whereas sizably relaxing the budget constraint (i.e., by 50 percent) has no impact on the share of organic products in participants' baskets, the priming significantly decreases the share of organic products for individuals with below-median environmental attitude, similar to the survey data.

Keywords: consumption behavior, inflation concerns, online shopping experiment, organic food, sustainability

JEL classification: C93, D12, D84, D91, E31

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1. Introduction

Extreme weather events do not only occur more often around the globe, but they also raise awareness for climate change related consequences that threaten health, economic prospects, and environmental sustainability. Whereas the need to act on climate change seems widely shared, political programs and society are divided on how to achieve more climate friendly behavior by firms and consumers (Dechezleprêtre et al. 2022). Investments in new, green technologies is the most likely avenue to reduce greenhouse gas emissions for firms (Gillingham and Stock 2018). Regarding consumers, existing scientific research discusses the role of different policy tools including the dispersion of social norms or relaxing financial constraints for shaping a more pro-environmental consumption behavior (Andre et al. 2024, Farrow et al. 2017). Yet, consumer prices in many countries have rapidly increased over recent years following supply-chain pressures and geopolitical tensions (Acharya et al. 2023), which might interact with the effectiveness of conventionally discussed instruments in case inflation concerns dampen green product consumption.

Given the change from a prolonged period of low inflation to significant price increases over the last years, recent research (re-)assesses from a more macroeconomic point of view how consumers respond to inflation. Related studies show clear evidence that consumers respond to news about inflation rates both as concerns their sentiment, inflation expectations and resulting consumption choices, and thus provide relevant insights for monetary policymakers (see e.g. Coibion et al. 2023, Macaulay and Song 2023, Salle et al. 2023, Treu and Hartwig 2023). We take a more microeconomic view and ask whether being confronted with changing prices, consumers do not only re-consider spending on, e.g., durable versus non-durable goods, but whether inflation concerns might also affect green product consumption. We focus on the consumption behavior of food, which every individual necessarily has to conduct regularly and we ask how a more sustainable daily-life consumption behavior can be achieved since contemporary agricultural production is associated with health and sustainability concerns. We start by conducting a nationally representative online survey in Germany in 2022 to evaluate individuals' consumption of organic products as well as their norms regarding organic consumption. The survey results show that particularly participants with a lower environmental attitude² as well as those with higher inflation concerns report to a lesser extent to grasp organic products if these are available. After controlling for observable characteristics such as income and educational level, only the correlation with concerns about future prices remains significant.

² Environmental attitude is defined such that higher values reflect that participants care more about the environment and climate change.

Hence, we provide the first evidence that the propensity to buy organic products might decline in highly inflationary environments.

We then seek to identify in a pre-registered framed field experiment (Harrison and List, 2004) whether there is a causal link between inflation concerns and sustainable consumption choices conditional on environmental attitudes. To do so, we invited the population of two medium-sized German cities to take part in an online study in which they had to fill a shopping basket via the online shopping platform of a well-known and widely scattered supermarket focused on food. We incentivized revealing true preferences by a raffle with a total of ten winners who would receive their self-assembled shopping basket. We analyze participants' shopping choices based on five different treatment conditions they have been randomly allocated to.

We start by assessing whether typically discussed policy approaches aiming to change consumption behavior by exposing individuals to *social norms* and *lifting financial constraints* effectively cause individuals to regulate themselves and change consumption towards more sustainable behavior. Because more sustainable products, such as organic food, are usually more expensive, lifting financial constraints might allow individuals to change their consumption patterns. Yet, it remains a priori unclear what will happen if financial constraints are lifted. Individuals might also just decide to buy more of what they were used to buying instead of changing their basket towards greener products. We evaluate these effects against the backdrop of *social norms*, which are a major determinant of individual behavior (see also Farrow et al. 2017) and often more important than monetary incentives.

Our main contribution to the literature arises from assessing the role of *inflation concerns* for organic product choices. In the respective treatment group, we use the priming technique to make individuals' concerns more salient (compared to a control group) through, among others, confronting participants with information on the increase in consumer prices in the aggregate and separated by product groups in Germany.

Our results obtained by the framed field experiment can be summarized as follows. When sending participants to the online supermarket, the average share of money spent on organic products is 24.08% but there is a wide range of heterogeneity. In line with expectations and previous literature, relaxing the budget and exposing participants to social norms about bio consumption (but only at the same time) raises the share of organic products in the basket. Hence, this result creates confidence in our set-up and sample as the direction of the effect is as expected and in line with the literature. The observed differences in the survey in terms of

organic consumption behavior by environmental attitude can be confirmed in the field experiment. Individuals with a low environmental attitude are irresponsive to a higher budget and social norm exposure, which is in contrast to those participants with high environmental attitudes. For the latter, we find a significant increase in the share of organic products in the basket.

The second key result emerges once we consider the outcome of the priming exercise. While those with a low environmental attitude did not respond to the previous treatment, i.e., relaxing the budget constraint and exposing them to social norms, once confronted with information about recent inflationary developments, the share of organic products significantly declined compared to the control group. The negative effect of triggering inflation concerns can only be dampened when both relaxing the budget and exposing participants to social norms. In sharp contrast, we observe no adjustment of the basket following the prime treatment for the individuals with high environmental attitudes suggesting that in this group sustainable consumption patterns remain stable even when inflation concerns are triggered. Consequently, our results do not only establish that inflation concerns are a relevant threat to green consumption but also that the ex-ante established attitude towards protecting the environment is a crucial factor in shaping consumer responses. Policy measures might thus take the environmental stance of the target group into account. Moreover, achieving price stability is also beneficial from a sustainable consumption promoting perspective.

Our study is related to the literature assessing the determinants of sustainable consumption behavior. For example, the role of social norms has been well established as a relevant determinant of pro-environmental behavior, e.g., see Farrow et al. (2017) for a review. Andre et al. (2024) conducted a global survey showing that almost 70% of participants would be willing to spend a small part of their income to combat climate change. Additionally, the survey results show that individuals systematically underestimate climate-friendly norms among their fellow citizens. De Groot et al. (2021) find that personal norms determine the effectiveness of social normative messages as regards pro-environmental behavior. The positive effect of norms has also been revealed in an online shopping experiment on sustainable consumption similar to ours (Demarque et al. 2015). Furthermore, Welsch and Kühling (2009) find that the behavior of reference groups as well as routines are relevant in shaping organic consumption patterns. Based on these results, we evaluate social norms regarding organic consumption in a representative survey and include a social norm treatment within the following field experiment. In contrast to surveys investigating whether individuals are willing

to spend more on green consumption, the field experiment allows us to assess whether they do so when filling the basket in the supermarket.

Besides social norms, the literature has shown that socio-demographic characteristics, and especially income, are relevant factors in shaping sustainable consumption patterns (e.g., Berthold et al. 2023, Otto et al. 2019). On the one hand, richer households, tend to show a larger CO2 footprint while, on the other hand, they might find it easier to change the consumption basket to (usually) more expensive organic products. Yet, based on a review of 83 research articles, Aschemann-Witzel and Zielke (2017) argue that income is only a partial explanatory factor; it is superseded by psychographic variables. The authors suggest that public policy should do two things: address limited budgets and provide more information, e.g., about price gaps.³ Similar grocery shopping experiments have been conducted by List et al. (2022) to assess the role of monetary incentives and tips on healthy food for healthy purchase behavior, by Vellinga et al. (2022) on how to affect meat consumption, or by Huitink et al. (2020) on how to achieve more healthy purchases in supermarkets in the Netherlands. However, macroeconomic drivers such as an increase in the price level and inflation concerns have been mostly neglected so far in related studies, a gap that we aim to fill.

Consequently, our study is related to the role of inflation expectations, concerns about the future, and precautionary behavior (e.g., Fermand et al, forthcoming). The literature shows unanimously that individuals respond to information about inflation. For example, Dräger et al. (2023) found in a randomized control trial that inflation expectations are adjusted upwards in case individuals are exposed to information about rising rates of inflation. Salle et al. (2023) conducted a lab experiment and found that not only lifetime experiences of inflation but also providing information about a certain inflationary environment shape how individuals form inflation expectations. Similarly, based on a randomized control trial in the Netherlands, Coibion et al. (2023) find that providing information on inflation affects expectations and thus consumption decisions, in particular as concerns durable goods. Their study thereby focuses on a low inflation environment and assesses households' spending behavior for non-durable and durable goods via surveys (see also Coibion et al. 2022 for a similar study based on US households). We contribute to this literature by assessing whether inflation concerns have

³ For example, Fosgaard et al. (2021) and Beyer et al. (2023) find that providing information about carbon footprints via an app or labels reduces the climate impact of grocery purchases by altering consumption choices (in particular in terms of meat) and it induces consumers to choose more climate friendly dishes, respectively. Jessoe and Rapson (2014) assess the effect of providing information about energy prices combined with households' energy usage in real time on the price elasticity of their energy demand. Bernard et al. (2023) study how information provision on how to reduce CO2 emissions affects individuals' propensity to behave more environmentally friendly.

consequences for sustainable consumption and whether there are intermediating factors that can stimulate organic purchases even in a macroeconomic environment characterized by increasing consumer prices.

The paper is structured as follows. In the next section, we describe the representative survey and its main results. In Section 3, the framed field experiment including the different treatments are explained before we move to the analysis of results in Section 4. Conclusions are drawn in Section 5.

2. A nationwide survey

2.1. Survey design

The nationwide survey served two purposes. First, we wanted to gather some insights into whether fears about future inflation are correlated with organic food consumption in a sample of the broader population. Second, we needed information on the social norm regarding organic food consumption as input for the following field experiment.

To conduct this survey, we used the online access panel of a German research company. This panel allows us to draw a representative sample of the German population concerning age (i.e., five age groups), gender, educational level (university degree, A-levels, lower than A-levels), and the federal state respondents are currently living in. Upon completion, respondents received their payment via the research company depending on the length of the survey. The median response time was slightly above seven minutes. In addition to the standardized payment, participants had the chance to win 25€. The full survey can be found in Appendix A.1.

After the screening questions (i.e., age, gender, highest degree, federal state) to obtain a representative sample, the survey started with five questions on respondents' current purchase behavior. The item we were interested in as our dependent variable reads as follows: "*If available, I buy organic products.*" On the next page, we asked a set of determinants of consumer engagement in sustainable consumption similar to Pilgrimienè et al. (2020).⁴ Twelve individual items add up to four categories, which are used as control variables in the regression analyses: environmental attitude, perceived responsibility, perceived behavioral efficiency, and

⁴ Pilgrimienè et al. (2020) suggested a set of 24 items aggregated to six different categories. Given that the research company advised us to keep the survey shorter than ten minutes in order to ensure good data quality, we conducted a pretest including all six categories. The two categories for which we have not found a correlation with stated consumption behavior were then left out of the main survey. For the remaining categories, we decided to use only 3 out of 4 items.

the social environment. Responses were made on a 7-point Likert scale from 1 (completely disagree) to 7 (completely agree). Participants' environmental attitude, which we especially focus on, is defined such that higher values indicate a more pro-environmental attitude and composed of the following three items (for the remaining categories, see Appendix A.1, Part 2: Questions on green consumption):

I am very concerned about the environment and/ or climate change.

It is important that society as a whole changes consumption patterns to preserve the environment.

It is important to me that the products I use do not harm the environment.

To measure the social norm that prevails regarding organic food consumption, we started by giving some information on the water usage and greenhouse gas emissions of the agricultural sector, including the positive effects of organic farming, followed by questions on participants' future consumption plans. To measure both the descriptive and the injunctive norm, we subsequently asked them how many of 100 participants they believe have stated 1) to buy more organic products in the future and 2) that fellow citizens should pay more attention to the consequences of their consumption choices and buy more organic products. We incentivized the latter questions in that we made clear that a correct guess (± 3) makes them eligible to take part in a lottery in which they can win 25€, which we paid to ten randomly drawn respondents.

After asking about some basic socio-demographics (e.g., family status or income level) and the Big Five personality traits⁵, we finished the questionnaire with the concerns respondents currently have. Besides our main independent variable of interest, i.e., the concerns about future inflation and energy costs, we asked about eight other potential concerns such as climate change and natural disasters, personal health, or an increasing societal division. Possible answers were divided into three categories including *no concerns*, *some concerns*, and *very big concerns*.

The survey was conducted within one week in June 2023. We paid the research company to recruit 1,200 respondents. To enhance data quality, the company delivers a ten percent higher number so that the fastest respondents (i.e., speeding individuals) can be dropped afterward. On top of that, we checked whether respondents showed variation in their response behavior in the five different survey blocks. If a respondent has always given the same answer on the 7-point

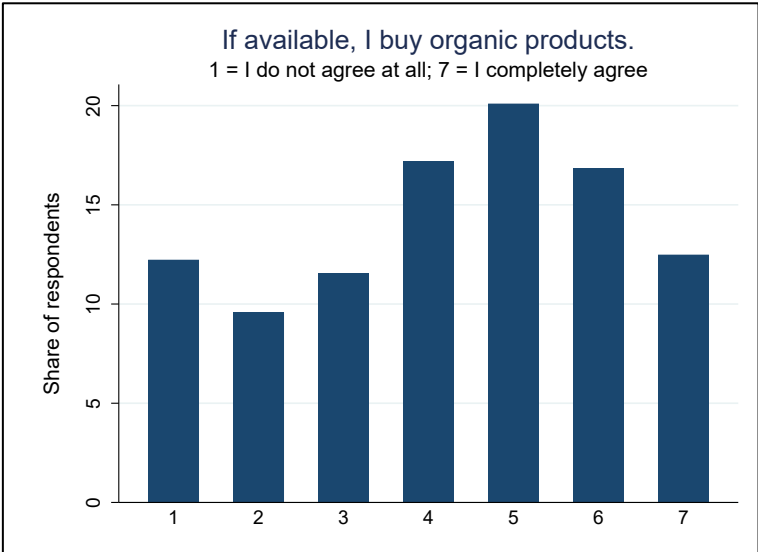
⁵ Awais et al. (2020) show an association between the Big Five and sustainable consumption behavior. To control for these personality traits, we use the reduced form of the Big Five personality framework (Costa & McCrae, 1989).

Likert scale in at least three out of the five blocks, this observation was dropped (20 cases). After this data cleaning process, we have a final sample of 1,169 responses. For some basic information on the composition of our sample, see Appendix B.1.

2.2. Survey results

We exploit the information collected via the survey to get some first insights on the relation between organic product consumption, climate attitudes, and inflation concerns. In Figure 1, we observe a sizeable share of respondents who claim to buy organic products if available. Given that the market share of organic food was only about 6.5 percent in Germany in 2022 (Bund Ökologische Lebensmittelwirtschaft e.V., 2023), respondents seem to overstate their organic product consumption to a certain extent, but there is also a sizeable share of respondents claiming not to do so. Moreover, even if individuals are willing to buy organic products, the availability of organic products in supermarkets might be limited, and organic food stores are not yet widespread.⁶

Figure 1: Distribution of the dependent variable (Organic product consumption)

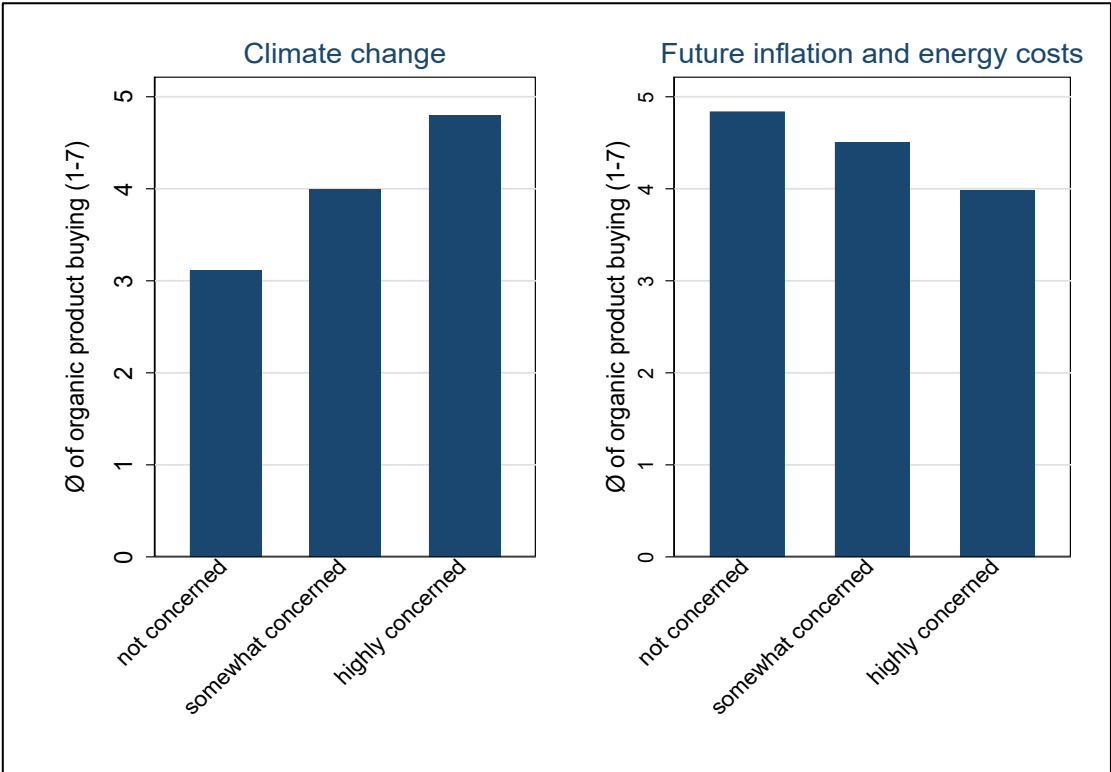


Notes: This figure shows the share of respondents answering to (not) buy organic products if available. The answer categories range from 1 (I do not agree at all) to 7 (I completely agree).

⁶ Whereas *one* of the leading supermarket chains in Germany (i.e., “REWE”) has already about 3,700 stores, the *ten* most widespread organic supermarket chains had only a total of 707 stores as of January 1, 2023. See: https://www.handelsdaten.de/ranking-der-grossten-bio-supermarktbetreiber-deutschland-2023?utm_source=Newsletter&utm_medium=email&utm_content=Link-Hd-Bio&utm_campaign=nl-kw-6-23

The direction of the correlation between organic purchase behavior and individuals' concerns about the future is in line with what one would predict, as shown in Figure 2. The more concerned respondents are about climate change, the higher their stated consumption of organic products (left panel of Figure 2). On the contrary, higher concerns about future inflation and energy costs are negatively related to organic product consumption (right panel). Due to the heterogeneity of our sample regarding educational background, income, or other potentially relevant characteristics, we furthermore conducted regression analyses to check whether these observed correlations hold after controlling for these characteristics. For example, Blankenberg and Alhusen (2019) summarize in a review paper the different socio-demographic drivers of pro-environmental behavior such as age, gender, or income, but also discuss the need to control for interactions with drivers related to attitudes, which we account for by conducting sample splits.

Figure 2: Organic product consumption and concerns about the future



Notes: This figure shows the relation between organic product consumption and concerns about climate change (left panel), respectively concerns about future inflation and energy costs (right panel). Respondents could answer to be not concerned, somewhat concerned or highly concerned. For each of these three categories, the y-axis depicts the related average regarding respondents' stated behavior as concerns organic product consumption. The answer categories to "If available, I buy organic products." range from 1 (I do not agree at all) to 7 (I completely agree).

The regression results are shown in Table 1. We find environmental attitude and the social environment to be highly correlated with respondents' stated purchasing behavior of organic food in specification (1). In terms of socio-demographic traits, there is weak evidence that younger respondents are more likely to buy organic food while the highest positive point estimate is obtained for the variable that indicated whether respondents possess an academic degree. Interestingly, when controlling for the educational level, the positive relationship between organic food consumption and concerns about climate change (as observed in Figure 2) disappears; the point estimate is negligible in its size and statistically insignificant. Moreover, none of the other concern categories is correlated with our dependent variable, with concerns about future inflation and energy costs as the sole exception, where the variable takes on the values 0 for not concerned, 1 for somewhat concerned, and 2 for highly concerned. When including dummy variables equaling one for respondents answering that they are *somewhat concerned*, and respectively *highly concerned*, instead of the linear variable in specification (2), it seems to be a linear relationship even though the *somewhat concerned* dummy is not statistically significant. This might be a sample size issue since the majority of respondents (i.e., 55%) stated to be *highly concerned* about future inflation. Similar to the conclusions drawn from the right panel of Figure 2, we obtain further evidence of a negative correlation between inflation concerns and the tendency to buy organic products.

Given that individuals' environmental attitude is usually a strong predictor of sustainable behaviors (e.g., Corrado et al. 2022, Laureti and Benedetti 2018), one might hypothesize that individuals with a high environmental attitude, that is those who care more about the environment, place a high weight on the environmental consequences of their consumption. Consequently, they should show a more stable consumption pattern than individuals with a lower environmental attitude even in times of high inflation and consequently tighter budget constraints. To test this suggestion, we use a median split and compare the two subsamples of respondents with a below median environmental attitude versus respondents who care above the median about the environment. Results provided in specifications (3) and (4) confirm this suggestion. We find that the positive correlation between inflation concerns and organic food consumption is driven by individuals with a lower environmental attitude. For respondents with a high environmental attitude, there is still a negative point estimate but it is much smaller in comparison. Hence, the survey provides novel insights into a potential link between inflation concerns and organic consumption behavior, which depends on individuals' ex-ante environmental attitudes. This heterogeneity is further investigated in the subsequent field experiment.

Table 1: Explaining organic product consumption

	(1) <i>Full sample</i>	(2)	(3) <i>Environmental attitude: low</i>	(4) <i>Environmental attitude: high</i>
Environmental attitude	0.350*** (0.079)	0.349*** (0.069)	0.202** (0.100)	0.715*** (0.170)
Perceived responsibility	0.0324 (0.068)	0.034 (0.068)	-0.014 (0.100)	0.091 (0.098)
Behavioral efficiency	0.138* (0.076)	0.138* (0.076)	0.174* (0.101)	0.098 (0.121)
Social environment	0.269*** (0.045)	0.265*** (0.045)	0.330*** (0.072)	0.216*** (0.060)
Female	0.037 (0.100)	0.029 (0.100)	-0.143 (0.146)	0.158 (0.143)
Age cohort: 30-39	0.284* (0.167)	0.281* (0.166)	0.147 (0.236)	0.405* (0.245)
Age cohort: 40-49	0.201 (0.175)	0.190 (0.176)	0.401* (0.242)	0.016 (0.268)
Age cohort: 50-59	0.109 (0.160)	0.098 (0.158)	0.124 (0.224)	0.029 (0.236)
Age cohort: 60-75	0.101 (0.189)	0.079 (0.189)	-0.085 (0.301)	0.083 (0.263)
Having children (yes/no)	-0.073 (0.101)	-0.081 (0.100)	0.083 (0.147)	-0.197 (0.141)
A-levels	0.086 (0.124)	0.099 (0.122)	0.051 (0.171)	0.161 (0.182)
University graduate	0.418*** (0.124)	0.429*** (0.122)	0.294 (0.186)	0.517*** (0.165)
<i>Concerns about (0-2):</i>				
Public debt	-0.008 (0.076)			
Increasing societal division	0.071 (0.082)			
Personal health	-0.013 (0.072)			
Military conflicts	-0.032 (0.072)			
Pensions and old age poverty	-0.040 (0.080)			
Climate change & natural disasters	0.001 (0.093)			
German competitiveness	-0.018 (0.077)			
Inflation & energy costs	-0.185** (0.092)			
Digital security	-0.044 (0.085)			
Inflation: Somewhat concerned		-0.272 (0.201)	-0.411 (0.332)	-0.074 (0.246)
Inflation: Highly concerned		-0.480** (0.202)	-0.664** (0.328)	-0.268 (0.252)
Additional controls	Yes	Yes	Yes	Yes
N	1,169	1,169	543	626
Adjusted R ²	0.363	0.366	0.237	0.197

Notes: OLS estimates. The dep. var. is organic product purchase behavior, where (1) 7 indicates that respondents (do not agree) completely agree to buy organic products if available. Column 1 includes controls on different types of concerns. Columns 2-4 only include dummy variables for concerns about inflation, the reference category is “not concerned”. Columns 3 & 4 split the sample into respondents with below/ above median environmental attitudes. Additional controls are the Big 5 personality traits, the federal state, monthly gross income, employment status (for the full table, see Appendix C1). Robust SEs are shown in parentheses. Significance levels are denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

3. Experimental design of the framed field experiment

3.1. Recruitment of participants and organizational details

To establish a causal relationship between organic consumption and inflation concerns, we conducted a framed field experiment. Given the differences in consumption behavior between university graduates and non-graduates, among others, we refrained from using a standard subject pool for our main experiment. Hence, we recruited participants within two medium-sized cities in central Germany using flyers and advertisements on regional online platforms and a local newspaper (see examples in Appendix A.2.1). Potential participants were invited to take part in an online study dealing with consumption behavior in the supermarket. It was made clear that every participant receives a fixed payment of 20€ for an estimated study time of 30 minutes⁷, which could also be donated to a charitable organization. Moreover, participants had the chance to win the shopping basket they had to fill during the study. Participants were required to be of age 18 or older and to have access to a laptop or desktop computer.

Interested individuals first had to register for participation. On the registration webpage (see Appendix A.2.2.), they had to provide their name, age, gender, email, and postal code. We used the latter to check whether they lived in one of the two cities. Moreover, we used the postal codes to apply a block design for randomization. This method ensures a (roughly) equal distribution of all treatment conditions within areas and, therewith, we account for socio-demographic differences between areas. After the form was completed, we sent an automated registration confirmation including the submitted information and clarified that they were only eligible for a payment if they used the same data when requesting their payment after study participation since the study was completely anonymous. To confirm that they participated, participants received a randomly drawn payoff code at the end of the study, which also had to be entered on a separate payment webpage.

The experiment took place in October 2023. Eligible registered participants received the study link via email and they had a 14-day period to take part. One week after sending the invitation emails, we compared the email addresses that were submitted after the completion of the study and via which participants indicated that they wanted to participate in the shopping basket raffle with the addresses to which we had previously sent the invitations. If addresses were missing, we sent a gentle reminder that there was one week left to participate. The

⁷ The median time for participation was indeed 30 minutes, and it fluctuates only minimally (i.e., by one to two minutes) between treatment groups.

experimental design was pre-registered (https://aspredicted.org/6F6_FLN) and approved by an institutional review board.

We calculated the sample size to have sufficient power (i.e., 0.8) also for the subgroup analysis. However, we missed the target of recruiting 625 participants.⁸ The final sample consists of 500 individuals with 67.1% being female. Participants' age ranges from 18 to 70, with an average age of almost 34 years. Compared to our survey sample, experimental participants are relatively well educated with only 14.6% having less than A-levels as their highest educational grade. However, the participant pool differs from a standard subject pool since we have only 35.6% of student participants. 92.4% of all participants claim to be at least somewhat concerned about future inflation and energy costs.⁹

3.2. Measuring consumption behavior

To measure participants' organic product consumption dependent on the allocated treatment condition, we redirected them to the webpage of a local supermarket¹⁰. We asked them to fill a shopping basket up to a certain amount –which also depended on the concrete treatment– and in such a way that the basket resembles a typical weekly shopping trip. Moreover, they had to put at least ten different items into the basket to make it valid. For the detailed instructions, see Appendix A.2.3. The participants delivered their baskets to us via a pdf of their chosen basket. We clarified that they should not buy this basket but that ten winners will be drawn after the study who would receive their basket (if it fulfils the given criteria). Using such a raffle allowed us to observe incentivized decisions in a field context with rather high stakes but without overstressing the research budget.

To ensure that also less computer-affine individuals could take part in our study, we explained in detail how to fill the basket online and how to generate and upload the pdf of that basket. Among a series of explaining screenshots, we showed how to filter for specific products, which also included organic products. Organic products are marked as such in participants' baskets with the item “Bio”. As our *dependent variable*, we calculated the share of money spent for organic products in relation to the basket's total value.¹¹

⁸ Ex-post power calculations, however, reveal a still acceptable power of 0.696 for our main analysis of interest (i.e., treatment “Control” vs. “Prime” in the subgroup of individuals with low environmental attitude) given $\alpha=0.1$ and a power of 0.578 if $\alpha=0.05$.

⁹ Detailed descriptive statistics separated by treatment group can be found in the Appendix (Table C.2.)

¹⁰ Participants were directed to the online shopping platform of the supermarket “REWE”, which is well known and widely scattered across Germany with a standardized product offer across its local supermarkets focused on food.

¹¹ In total, we had 518 participants. While digitalising the pdfs of the shopping baskets, we had to exclude 18 of those: five individuals obviously have registered twice and uploaded exactly the same pdf, eight pdfs did not show

3.3. Treatments

For all participants, the study started by asking about some basic socio-demographics, their environmental attitude, and a measure of loss aversion (adapted from Mukherjee et al. 2017). The questions underlying the variable “environmental attitude” are the same as in the previous survey such that higher values reflect that respondents care more about the environment (see Section 2.1). The **treatment group “Control”** proceeded with questions on their organic food consumption, for example, on where and how often they buy organic food or for what reasons. Importantly, all treatment groups received these questions before filling their shopping baskets. Filling the baskets, as described above, was then also the next step for the control group, with a budget of 80€. Given that we were interested in participants’ concerns about inflation but did not want to make the main study interest too obvious, we asked participants about their concerns in more general terms in the next step. To keep study time as similar as possible across all treatment groups, we then finished the study with the “priming part”, which is explained in the following paragraphs.

The **treatment group “Money” (M)** has the same stages as the control group but we relaxed the budget constraint sizably (i.e., 120€) to investigate whether individuals refrain from buying organic products because of higher prices than non-organic products and non-sufficient budgets. We replicated this treatment in the **treatment group “M+Norm”** but with one additional stage through which we wanted to analyze the role of social norms for organic product consumption. Here, before proceeding to the shopping stage, participants were informed about the advantages of organic products, including a hyperlink to a short video provided by a German environmental institute for interested participants. Moreover, we told them that in a recent representative survey, that is, our survey as described above, 66% of all respondents stated that more organic products should be purchased in the future.

Given that all participants had to face high inflation rates during the last year and months, we used the priming technique (for an overview of priming in economics, see Cohn and Maréchal 2016) to causally assess the impact of inflation concerns. In this priming part, we confronted participants with information about the increase in consumer prices in the aggregate and separated by product groups in Germany. We then asked them about their past and possibly future behavioral changes due to inflation (i.e., whether they had to limit their consumption and if yes, in which areas). The **treatment group “Prime”** is based on the control group with the

a shopping basket, and the remaining five did not fulfil the given criteria (e.g., the total value of the shopping cart exceeded the budget).

only difference being that the priming part takes place before the shopping stage so that inflation rates and, therewith, potential concerns become more salient for participants when making their consumption decisions. The role of inflation for consumer sentiment and consumption choices has recently been studied by, for example, Macaulay and Song (2023) or Coibion et al. (2022, 2023), and there is clear evidence that information about inflation can affect sentiment or spending behavior. Hence, if inflation concerns affect organic consumption choices, our priming should reveal a change in behavior.

Finally, the **treatment group “MN+Prime”** was intended to analyze whether inflation concerns also harm the potentially positive effects of relaxed budget constraints (**M**) and social norms (**N**). Hence, this treatment is based on the treatment “M+Norm” but again only switching the priming part from the end of the study to its beginning. Table 2 summarizes the order of the single stages for each treatment group. The detailed information provided to participants in the treatment group “MN+Prime” can be found in Appendix A.2.3.

Table 2: Experimental procedure overview by treatment

Stage	Control	Money	M+Norm	Prime	MN+Prime
1	Socio-demographics, environmental attitude and loss aversion				
2	Organic product cons.	Organic product cons.	Organic product cons.	Priming & inflation concerns	Priming & inflation concerns
3	Shopping (max. 80€)	Shopping (max. 120€)	Norm info	Organic product cons.	Organic product cons.
4	Concerns general	Concerns general	Shopping (max. 120€)	Shopping (max. 80€)	Norm info
5	Priming & inflation concerns	Priming & inflation concerns	Concerns general	Concerns general	Shopping (max. 120€)
6			Priming & inflation concerns		Concerns general

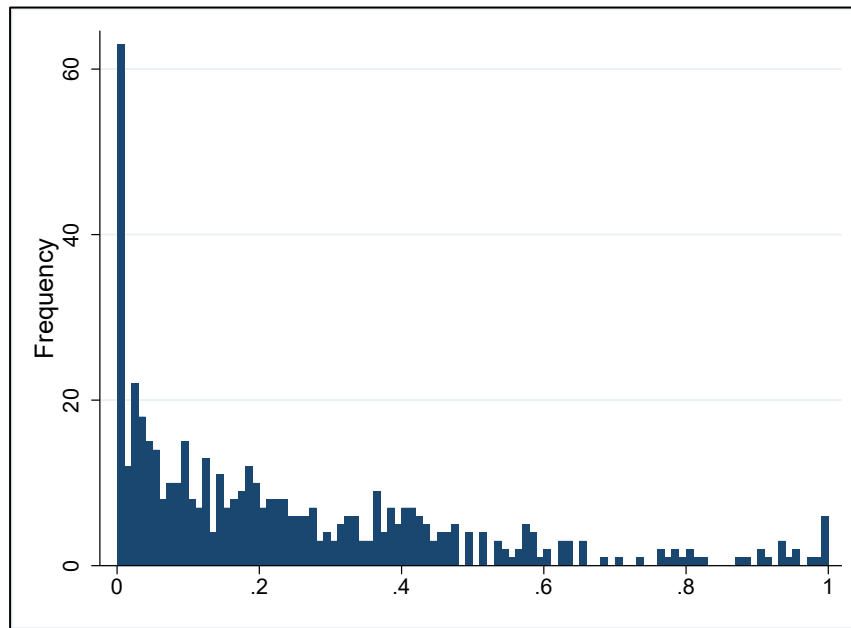
4. Results of the framed field experiment

We now present the results obtained for the framed field experiment. First, a descriptive overview of the full sample is provided. Second, we discuss differential results when relaxing the budget constraint and exposing participants to social norms depending on their environmental attitudes. Third, we turn to our main question and study the additional role of inflation concerns.

4.1. Overview of results for the full sample

The average share of money spent on organic products is 24.08%, ranging from 0% to 100%. Across all treatments, 62 out of 500 individuals did not spend any money on organic products and more than one-third (37.4%) of all individuals did not spend more than 10% of their baskets' value on organic products. The full distribution of shares is shown in Figure 3.

Figure 3: Distribution of shares of money spend on organic products

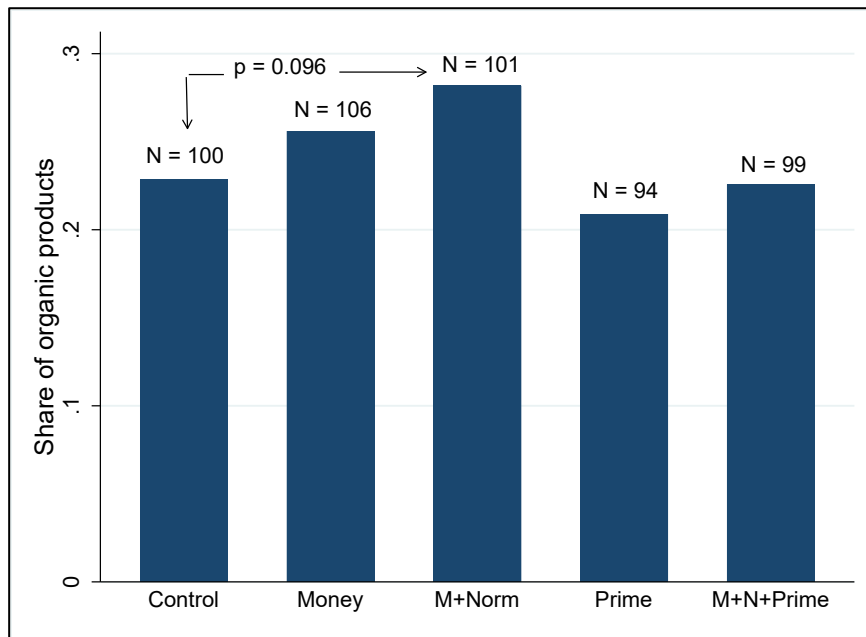


Notes: This figure shows the number of respondents (y-axis) spending a certain share of money on organic products in total money spent for the shopping basket (x-axis).

The average shares of money spent on organic products in the total value of the basket by treatment group are shown in Figure 4. The only statistically significant difference (at the 10% level)¹² can be found between the treatment groups “Control” and “M(oney)+Norm”. Relaxing the budget constraint on its own (treatment group “Money”) does not significantly increase individuals’ consumption of organic products. However, relaxing the budget constraint *and* pointing participants toward the social norm seems to make a difference. Based on the survey’s findings regarding the importance of individuals’ environmental attitudes, we will go into more detail in the next subsection (as pre-registered).

¹² *p*-values are obtained from two-sided t-tests, if not stated otherwise. All following figures only show *p*-values below 0.1. Note that there is also a statistically significant difference between “M(oney)+Norm” and “Prime” (*p*=0.033). Yet a direct comparison between the two groups is not useful because we manipulate three different dimensions (i.e., the budget constraint, the social norm, and the priming part) so that no causal conclusions can be drawn here.

Figure 4: Organic product consumption by treatment group



Notes: This figure shows the average share of organic products in the consumption basket, i.e., the money spent on organic products in the total value of the basket by treatment group. Above each bar, the number of participants for the respective treatment group is depicted.

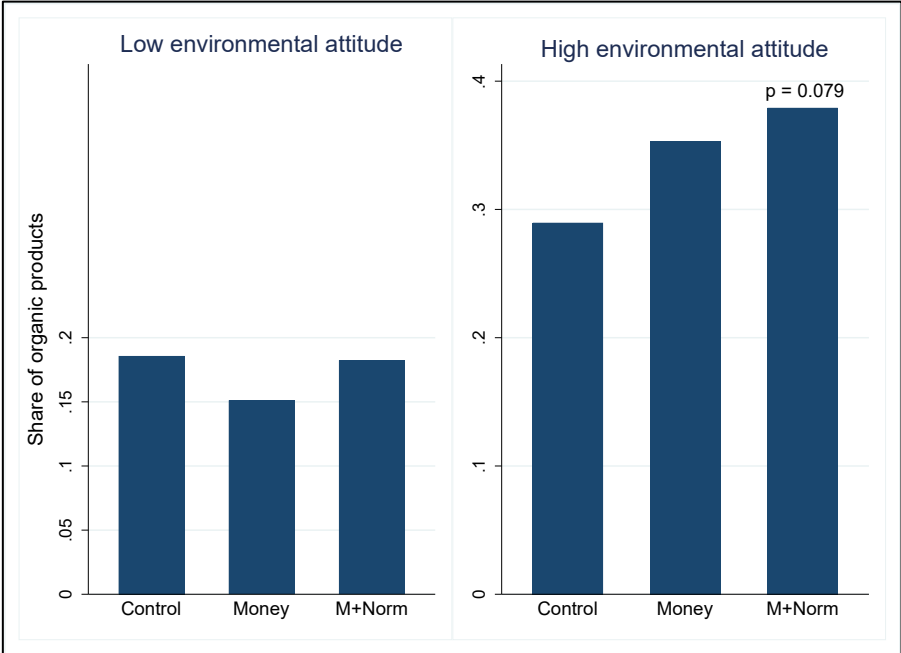
4.2. The role of money and norms by environmental attitude

From a policy perspective, the previous results can be perceived as good news in that it seems to be possible to spur individuals' consumption of organic products by relaxing their budget constraints and exposing them to social norms speaking in favor of organic consumption choices. For example, reduced value-added taxes for organic products, discount vouchers for organic products, or advertisement campaigns highlighting the social norm could be real-life examples.

In our subgroup analysis (see Figure 5), however, we find that such measures have their limitations. Individuals with a low environmental attitude (again based on a median-split) are insensitive to the measures of relaxing budget constraints and communicating social norms (Figure 5, left panel). For these individuals, who have already shown a lower share of organic product consumption in the control group compared to those with high environmental attitudes, other measures have to be found to induce a behavioral change. On the contrary, for individuals with a high environmental attitude, we do observe a sizeable increase in the share of organic products in the basket, which goes from 28.96% in treatment "Control" to 37.92% in treatment "M(oney)+Norm" (see the first and third bar in the right panel). Looking at the average shares, relaxing budget constraints already seems to impact individuals' behavior (35.33%, second bar

in the right panel), but this difference is statistically insignificant ($p=0.246$) —which might be explained by the missed target of recruiting 65 individuals per subgroup ($n_1=41, n_2=55$). In sum, these results show that well-established drivers of organic consumption, such as budget and norms, matter. Yet, there is significant heterogeneity by environmental attitude, which has to be considered when designing policies or conducting further analyses on the topic. In the same vein, Bernard et al. (2023) find that for survey participants more inclined to combat climate change, their information treatment on how to reduce CO2 emission proved to be more effective. Similarly, de Groot et al. (2021) find that personal norms are a strong driver of pro-environmental behavior and determine the effectiveness of social normative messages.

Figure 5: Positive effects driven by individuals with high environmental attitude



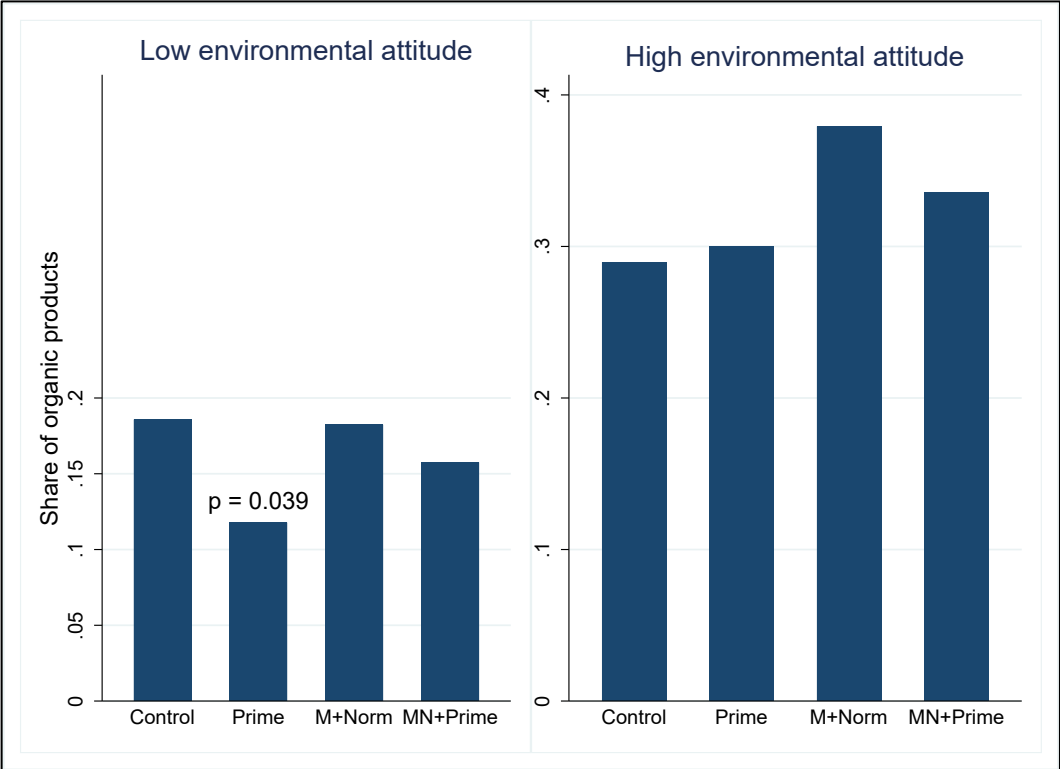
Notes: This figure shows the average share of the value of organic products in the shopping basket by treatment group. The sample is split at the median into individuals with a “low” (left panel) versus “high” (right panel) environmental attitude.

4.3. Priming effects by environmental attitude

We now turn to answer our main research question, i.e., whose organic product consumption is affected by inflation concerns, if at all. Given the recent period of increasing (and high) inflation rates in the euro area, where especially prices for energy and food have been affected, concerns about rising prices might affect consumption behavior. Figure 6 summarizes the main results separated by individuals with lower and higher environmental attitudes.

After being primed on the high inflation rates individuals had to face during the last year and months of 2023, we find that participants with a *low environmental attitude* fill their baskets with a significantly lower share of organic products compared to the control group ($p=0.039$). This is remarkable given that this subgroup did not react to the relaxation of budget constraints and the social norm as shown by the third bar on the left panel of Figure 6. However, it seems to be possible to dampen the negative effects of inflation concerns as regards organic consumption patterns when implementing these measures at the same time, see the non-significant difference between the treatments “M(oney)+Norm” and “M(oney)N(orm)+Prime”, as shown in the third and fourth bar on the left-hand side.

Figure 6: Low environmental attitude individuals are sensitive to inflation concerns



Notes: This figure shows the average share of the value of organic products in the shopping basket by treatment group including the priming exercise.

Hence, in a world with continued pressure on prices, additional measures have to be considered to stimulate green product choices in the subsample of the population without sufficient environmental awareness. Malmendier (2021) argues that individuals overstate the likelihood of past events happening again in the future such that, in the context of our study, there might be a threat that negative experiences with rapidly and steeply increasing consumer prices triggering inflation concerns might have a longer run impact on consumption decisions.

In the same vein, Salle et al. (2023) find that lifetime experiences of inflation shape inflation expectations, which might result in longer-lasting effects on consumption behavior for the generations currently experiencing the significant rise in prices.

Again, we observe substantial differences in behavior between individuals with higher versus lower environmental attitudes. In the case of a *higher environmental attitude* (right panel), we do not observe any negative effects of the priming compared to the control group, neither in the treatment “Prime” nor in “MN+Prime”. Even though the positive effects of relaxing budget constraints and making social norms salient vanish in the case of being additionally primed (“Control” vs. “MN+Prime”, $p=0.454$), the average share of organic products is still slightly higher than in the control group. Hence, the results suggest that once individuals have formed awareness for the environment and resulting attitudes, their consumption decisions are not that sensitive to negative external shocks such as price increases.

We finally check the robustness of our main priming result. Therefore, we use regression analysis and control for basic socio-demographics such as gender, age, and household income to take into account the possibility of non-perfect randomization. Moreover, speeding participants might not have taken the shopping task seriously and, therefore, influenced results. To explore the latter suggestion, we define speeding participants in two different ways. First, we checked the distribution of the number of items in the basket (also by household size, which did not differ) and dropped the lowest percentile, i.e., participants with less than 15 items. Second, we did the same with the lowest percentile of time spent finishing the study (i.e., less than 16.3 minutes).

All results are shown in Table 3. Column (1) shows that receiving the prime treatment that triggers inflation concerns significantly reduces the share of organic products in the basket compared to the control group. This result remains robust when including socioeconomic controls in specification (2). Including household income in specification (3) reduces the sample size by four individuals but does otherwise not affect outcomes. Hence, we do not control for household income in the speeder robustness checks to refrain from reducing the sample size any further. The priming effect is robust toward speeding and the point estimate becomes even bigger as shown in columns (4) and (5).

Even though the causal treatment effect in the affected subgroup is already sizeable from an economic point of view, it is likely to be only the lower bound since the priming makes inflation concerns more salient but this does not mean that individuals do not face any inflation concerns without our priming intervention. If this is the case, the treatment has only a limited

effect on individuals' consumption decisions. When looking at the treatment group "Control", we do indeed observe a correlation coefficient of -0.236 between the share of money spent on organic products and participants' stated concerns about future inflation and energy costs. This negative correlation coefficient is even significant for the full sample instead of only for individuals with a low environmental attitude ($p=0.018$).

Table 3: Checking the robustness of the priming effects

	(1) Baseline	(2) + Socioeconomic controls	(3) + Household income	(4) Item speeding	(5) Time speeding
Prime	-0.068** (0.032)	-0.069** (0.034)	-0.073** (0.036)	-0.080** (0.039)	-0.088** (0.037)
Female		-0.056 (0.040)	-0.063 (0.041)	-0.075* (0.041)	-0.080* (0.044)
Age cohort: 30-39		-0.054 (0.067)	-0.049 (0.069)	-0.060 (0.075)	-0.040 (0.074)
Age cohort: 40-49		-0.039 (0.078)	-0.027 (0.075)	-0.018 (0.079)	-0.025 (0.079)
Age cohort: 50-59		-0.076 (0.087)	-0.064 (0.093)	-0.078 (0.098)	-0.088 (0.099)
Age cohort: 60-70		-0.113* (0.066)	-0.125* (0.073)	-0.141* (0.073)	-0.162** (0.073)
Having children (yes/no)		-0.011 (0.054)	-0.026 (0.067)	-0.008 (0.072)	-0.054 (0.069)
University graduate		0.057 (0.043)	0.080* (0.047)	0.073 (0.052)	0.069 (0.047)
Inflation: Somewhat concerned		-0.037 (0.075)	-0.016 (0.078)	-0.031 (0.074)	-0.001 (0.077)
Inflation: Highly concerned		-0.125 (0.077)	-0.101 (0.076)	-0.121* (0.073)	-0.098 (0.077)
Constant	0.186*** (0.024)	0.315** (0.131)	0.204 (0.126)	0.254** (0.126)	0.214* (0.128)
Additional controls:					
Household income			Yes		
<i>N</i>	106	105	101	93	92
Adjusted <i>R</i> ²	0.031	0.095	0.102	0.103	0.139

Notes: OLS estimates based on the treatment groups "Control" and "Prime" for individuals with a low environmental attitude. The dependent variable is the share of the value of organic products in the total value of the consumption basket. We add socioeconomic controls in specification (2) and household income in specification (3). Specifications (2) to (5) furthermore include region, employment status and household size as controls not shown here (no significant point estimates). Specifications (4) and (5) exclude participants who speeded most or had a low amount of items in the basket. Robust standard errors are shown in parentheses. Significance levels are denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5. Conclusions

Achieving a more climate-friendly consumption behavior could be one cornerstone to combat climate change and natural resource destruction. The presence of social norms regarding green consumption, as well as relaxing financial constraints of especially poorer households given usually higher prices of more sustainable products could be possible avenues in that respect. However, in a world with increasing geopolitical risks translating into rising consumer prices and consequent inflation concerns, it is not obvious how effective conventionally discussed policy tools are. We hence aim to provide evidence in this regard.

Based on a survey being representative of the German population, we first gather information on organic product choices and find sizable heterogeneity in terms of the reported purchase behavior of organic products. While respondents more concerned about climate change report more often to buy organic products, this relationship vanishes after controlling for basic socio-demographic characteristics. On the contrary, organic product consumption stands in a negative relation with concerns about future price developments and this negative correlation remains after controlling for other observables.

In a framed field experiment conducted in two-midsized German cities in October 2023 and spanning a sample of 500 participants, we establish causal impacts. As commonly found in the literature, we find that a higher financial budget paired with social norms drives up the share of organic products in the consumption basket. However, it turns out that well-established drivers of green consumer choices matter only for those participants caring more about the environment and climate change. When studying the additional role of inflation concerns, results confirm the relevance of differences in environmental attitudes. Participants caring to a lower degree about the environment even declined their organic purchase behavior after being primed on high inflation rates. Interestingly, inflation priming does not affect those participants who have a higher environmental attitude suggesting that once individuals have formed awareness for the environment, consumption decisions are not that sensitive to external negative shocks such as significant price increases.

Consequently, and from a broader perspective, our findings suggests that in a world with increasing frictions due to climate change, geopolitical risk, and labor market shortages in which prices are more likely to increase, also consumers' inflation concerns are likely to go up and lower their propensity to buy organic products. Yet, there is relevant heterogeneity, which has to be considered when designing policies to stimulate green consumption patterns. Importantly, price shocks paired with a low environmental attitude result in declines in organic

consumption propensity and there seems to be limited scope to mitigate this decline by commonly discussed measures such as increasing budgets or exposing individuals to social norms. On the bright side, once pro-environmental attitudes are established, organic consumption is less sensitive to price shocks. Hence, raising awareness to protect the environment and fight climate change might be a key element to foster more sustainable behavior even in a more uncertain world. Finally, our results show that price stability could also be a contributing factor to easing the change in consumption patterns towards more sustainable products.

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Appendix

A Documentation of the survey and the experiment *(translated from German)*

A.1. The survey

Note: The following headings (i.e., Part 1: Personal Characteristics, Part 2: Questions on green consumption, ...) were not shown to participants, they shall only help to get a better overview of the survey.

Part 1: Personal characteristics

Age: _____

1. Gender:

- Female
- Male

2. What is your highest educational degree?

- Not (yet) graduated from school
- Lower secondary school graduation (“Hauptschule”), with or without completed apprenticeship
- Secondary school graduation (“Realschule”)
- High school diploma (“Abitur”) or technical college entrance qualification (“Fachhochschulreife”)
- University degree

3. In which federal state are you currently living?

Please choose: _____ *[drop down menu]*

Part 2: Questions on green consumption (based on Pilgrimienè et al. (2020); 7-point Likert scale from “completely disagree” to “completely agree”)

To start with, we would like to ask you some general questions about topics related to consumption and sustainability. Please indicate for each of the subsequent statements in how far you agree with it. Please bear in mind, there is no right or wrong, it is your personal opinion that counts.

Note: When we refer in the following to sustainable products, not only bio-certified products are referred to but also regional products or fair trade products, for example.

<i>Statement</i>	<i>Range</i>
If I can choose between similar products, I opt for the one that is more environmentally friendly.	1-7
If available, I buy organic products.	1-7
I prefer to buy products with an environmental certificate (e.g. "Blauer Engel", "Grüner Knopf", EU-Ecolabel)	1-7

When buying electronic devices, I take care of a positive assessment with respect to the EU energy label (energy consumption labeling).	1-7
I prefer products based on materials or with packages that are recyclable or reusable.	1-7

[Next page]

Since each individual can have any effect upon environmental problems, what I do can make a meaningful difference.	1-7
Individuals who opt for more environmentally friendly products are appreciated in society.	1-7
My everyday consumption decisions affect the environment.	1-7
Environmental protection is also in my responsibility, not only the one of the government and social organizations.	1-7
There are many people in my closest environment choosing environment-friendly consumption patterns.	1-7
By purchasing products made in an environmental-friendly way, each consumer's behavior can have a positive effect on the environment and society.	1-7
It is important to me that the products I use do not harm the environment.	1-7
It is worth it for the individual consumer to make efforts to preserve and improve the environment.	1-7
It is important that society as a whole changes consumption patterns to preserve the environment.	1-7
I am very concerned about the environment and/ or climate change.	1-7
The opinion of my colleagues, friends and relatives about my consumption patterns is important to me.	1-7
By taking a decision to buy products of a company harming the environment, consumers are responsible for the harmful effects.	1-7

Part 3: Questions on food

Now we would like to focus specifically on the topic of food. Some information in advance: The agricultural and food sector has a share of about 70 percent in water consumption and contributes by around one quarter to greenhouse gas emissions. About one third of worldwide available surface is used for livestock farming (including agricultural land used for growing animal feed). Hence, animal husbandry has by far the highest land use worldwide.

Our food system also has a significant impact on biodiversity. About 70 percent of the losses of biodiversity and 75 percent of deforestation are due to the production of food and feed.

Conversely, it also holds true:

Even small changes in our nutrition habits can have a significant impact on the protection of the climate and resources. If we gave up eating meat one day per week, we would need 600,000 hectares less of cultivated land and save around nine million tons of greenhouse gases.

In addition: **Organic farming relieves pressure on water and soil** by not making use of pesticides (which also benefits our health). This also promotes biological diversity of plants and animals. Ecologically friendly cultivated areas are better prepared for climate change, yielding good harvest even during hot summers.

Nevertheless, the market share of organic food was only 6.8% in 2021 and meat consumption was still at 55 kilograms per person per year, although the German Nutrition Society only recommends 15-30 kilograms.

Sources: WWF and German Environment Agency.

4. Are you planning to buy more food that is organic in the future?

- Yes.
- No.
- I already buy mostly organic food.

5. Are you planning to reduce your meat consumption in the future?

- Yes.
- No.
- I already avoid eating meat.

6. Do you think that your fellow citizens have not yet taken enough account of the effects of traditional agriculture and should therefore buy more food that is organic in the future?

- Yes.
- No.

7. Do you think that your fellow citizens have not yet taken enough account of the effects of high meat consumption and should therefore reduce their meat consumption in the future?

- Yes.
- No.

Part 4: Questions on beliefs

Please now assess how the other study participants answered the questions asked directly beforehand. You thereby have the opportunity to win 25 euros.

A note for your assessment: The respondents to this survey were chosen to obtain a close to representative sample for the entire German population.

8. How many out of 100 participants surveyed in this study do you think responded that...

- they want to buy more organic food in the future?
- they want to eat less meat in the future?
- fellow citizens should pay more attention to the consequences of their consumption choices and buy more organic food?
- fellow citizens should pay more attention to the consequences of their consumption choices and buy less meat?

Once the survey is completed, one of the four questions will be randomly selected. If your assessment on this selected question matches the actual result of our survey, then you will end up in the draw. We will draw 10 people from this lottery pot, who will then receive 25 euros.

Even if you are slightly wrong (i.e., if you estimate 3 people too much or too little), that is still considered a correct assessment. Hence, it is worth thinking about it for a moment before giving your answer!

Part 5: Socio-demographic characteristics

Please answer the following questions about yourself.

9. Are you in a relationship?

- yes
- no

10. Do you have children?

- yes
- 1 child
- 2 children
- 3 or more children

11. Where do you currently live?

- in a rural region
- in a small town (5,000 to 20,000 inhabitants)
- in a medium-sized city (up to 100,000 inhabitants)
- in a large city (100,000 inhabitants or more)

12. Which of the following categories best describes your professional status?

- Working full time
- Working part time
- Student or in training
- Pensioner
- Housewife/ househusband
- Self-employed
- Job seeking
- None of this applies

13. Your monthly gross income in €:

- up to 1500
- 1501 up to 2500
- 2501 up to 3500
- 3501 up to 4500
- 4501 and higher
- I do not receive a wage.
- I do not want to indicate that.

Part 6: “Big Five”

14. “Big Five” questions (please see Costa & McCrae, 1989)

Part 7: Questions on concerns

15. Finally, we would like to know how concerned you currently are about the following topics.

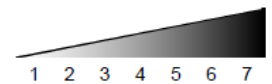
	Not concerned	Somewhat concerned	Highly concerned
Sovereign debt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increasing social division	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Threat of a military conflict	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insecure pensions and poverty in old age	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Climate change and natural disasters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
German competitiveness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inflation and energy costs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Digital security (e.g. hacker attacks)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Which of the previously mentioned topics worries you most?

Please choose: _____ [Dropdown menu]

17. To what extent do you agree with these last two statements?

(7-point Likert scale from “completely disagree” to “completely agree”)



I am easily distracted and it takes a lot of effort to concentrate on one activity.

My worries make it difficult for me to sleep at night or sleep through.

A.2. Experimental instructions

A.2.1. Recruiting examples

Local newspaper (in German): “Du bist Halle” (<https://dubisthalle.de/leibniz-institut-sucht-hallenser-fuer-studie-zum-kaufverhalten>, 14.09.2023)

Leibniz-Institut sucht Hallenser für Studie zum Kaufverhalten

VON ESEPPELT · 14. SEPTEMBER 2023

Das Leibniz-Institut für Wirtschaftsforschung Halle sucht Shopper. In einem Feldexperiment soll untersucht werden, welche Faktoren die alltäglichen Konsumententscheidungen im Supermarkt beeinflussen.

Dafür werden möglichst viele Teilnehmerinnen und Teilnehmer aus dem Raum Halle (Saale). Alle kommen in einen Lostopf. Für zehn glückliche Gewinnerinnen und Gewinner sind Inhalt und Lieferung des Warenkorbs gratis. Auch wer am Ende nicht dazugehört, bekommt garantiert 20 Euro überwiesen (oder kann diese an eine gemeinnützige Organisation spenden). Teilnehmende sollten im Raum Halle wohnen, volljährig sein, einen PC/Laptop und Internetzugang haben sowie circa 30 Minuten für die Teilnahme einplanen.

<https://www.iwh-halle.de/forschung/online-studie/>

Flyer (in German)

ONLINE SHOPPING

Chance auf den Gewinn
des Warenkorbbs 

Sie kaufen gern online ein?

Und haben Lust, die wissenschaftliche Forschung
am Leibniz-Institut für Wirtschaftsforschung Halle
zu unterstützen? Dann nehmen Sie an unserer
Online-Studie teil!




Fotos: © – Unsplash.


Fürs Mitmachen gibt es 20 Euro.

Fürs Mitmachen gibt es 20 Euro – und die
Chance auf den Gewinn des Warenkorbbs!

Wie wäre es, einen Wochenend-
einkauf gratis nach Hause geliefert
zu bekommen? Dann nehmen Sie
an unserer Online-Studie teil!

 Feste Auszahlung von 20 Euro an alle Teilnehmerinnen
und Teilnehmer. Das Geld kann auch an eine Wohl-
tätigkeitsorganisation Ihrer Wahl gespendet werden.

 Chance auf den Gewinn des Warenkorbbs, den Sie
sich selbst online mit Lebensmitteln zusammengestellt
haben.

 Zeitlich flexible Teilnahme innerhalb eines 14-tägigen
Zeitraums, Dauer circa 30 Minuten.

Weitere Informationen (u. a. auch zum Datenschutz) sowie die
Möglichkeit zur Registrierung finden Sie auf folgender Website:
<https://www.iwh-halle.de/forschung/online-studie/>

Wir freuen uns auf Ihre Teilnahme!



Einfach QR-Code
scannen
und mitmachen.

Bei weiteren Fragen kontaktieren Sie uns bitte per E-Mail unter:
onlinestudie@iwh-halle.de | www.iwh-halle.de

A.2.2. Registration page

Information about participating in a scientific study by the economic research institute¹³

What it is about

Would you like to take part in a scientific study on shopping behavior in order to support research at an economic research institute [*here the name of the institute was provided*], earn 20 euros and at the same time have the chance of winning a shopping cart filled with groceries online? Then register here!

How participants are selected

Our budget is limited. Registration therefore does not entitle you to participate in the study. If you are one of the selected participants, you will receive an email around the end of September 2023 (sender: OnlineStudie@xxx.de) with all further information. Anyone aged 18 or above can take part (only the institute's employees and their relatives are excluded from participation).

What to expect if you participate

You can take part in the study at any time within a given period of 14 days using a desktop PC or laptop. The time required for the study depends entirely on your own shopping habits, but we recommend scheduling around 30 minutes. In addition to filling the shopping cart, we will also ask you to answer a few questions about yourself.

What is there to win

All participants will receive an expense allowance of 20 euros for completing the study. As the study progresses, you may also choose to donate your payout to a charity organization of your choice. In addition, 10 participants will be drawn who will receive the shopping cart filled with the food items during the study.

Who is behind it

The economic research institute is a publicly funded, independent research institute and member of the Leibniz Association. The study is for scientific purposes only. We do not conduct market research and do not carry out the study on behalf of a company or another organization. The results of the study will be published on the institute's website.

¹³ Participants were informed about the name of the research institute. To preserve anonymity for reviewing, we replace the name by a more general formulation.

How we process your data

Your registration data will only be used for the purpose of carrying out the study, it will not be passed on to third parties and it will be deleted after the study has ended. After all payments have been paid out and the winners received the items of the shopping cart, the data collected during study participation will be fully anonymized, as well as stored and used exclusively for scientific purposes.

All information briefly summarized

Here is an overview of the most important information. If you have any questions, please contact: OnlineStudie@xxx.de.

- Fixed expense allowance of 20 euros for approx. 30 minutes of your time (transfer via bank transfer or option to donate)
- You make a valuable contribution to scientific research
- Flexible timing of the online participation within a period of 14 days; Further information will follow end of September
- 10 winners will also receive a self-filled shopping cart with groceries
- completely anonymized storage of your data exclusively for scientific purposes

Are you interested? Then register here:

Surname: _____

Last name: _____

Email: _____

Gender:

- female
- male
- diverse

Age: _____

Zip code: _____

A.2.3. The treatment “M(oney)N(orm)+Prime”

Welcome to our study!

Thank you for supporting our research. After completing the study, you will receive allowance payment of 20 euros via bank transfer. Alternatively, you can choose to donate to one out of three charities. Additionally, we will randomly select 10 participants who will receive the shopping cart put together during the study and which will be delivered to their home.

All data is collected and stored in a completely anonymous manner and only used for scientific purposes. After completing the study, you will be redirected to a separate website to enter the data required to transfer your expense allowance. Once the expense allowance has been transferred, this data will be deleted.

By participating in this study, you agree to the storage and processing of your data as described above.

Important: Only if you have registered and received an invitation e-mail from us, you can take part in the study. Your data (name and email address) on the payment website has to therefore match those indicated when registering.

It takes approximately 30 minutes to participate in the study. If you terminate the study prematurely (e.g. due to a lack of time), you will not be able to continue the study at a later moment in time; you will have to start from the beginning again.

Stage 1: Socio-demographics, environmental attitude, loss aversion

Before you start your shopping trip, we would like to ask you some basic questions.

1. Your age

2. Your gender

- Female
- Male
- Diverse

3. What is your zip code?

4. What is your highest level of education?

- No school leaving certificate (yet)
- Secondary (elementary) school leaving certificate [*“Haupt- oder Grundschulabschluss”*], with or without completed apprenticeship
- Secondary school without a high school diploma
- High school diploma [*“Abitur”*] or technical college entrance qualification
- University degree

5. How many people (including yourself) live in your household?

6. How many members of your household are children?

7. What is your household's average monthly net income?

This question refers to the amount that is available to your household each month minus taxes and social security contributions (unemployment, health and care insurance, statutory pension insurance).

You are of course completely free to answer this question. However, please keep in mind that this is an anonymous survey and the information would greatly help us in our research.

- Up to 1500€
- 1501€ up to 2500€
- 2501€ up to 3500€
- 3501€ up to 4500€
- 4501€ up to 6000€
- 6001€ and higher

8. Your employment status:

- studying/ vocational training
- part time
- full time
- retired
- (currently) without work

9. Please indicate to what extent you agree with each of the following statements. Please remember, there is no right or wrong here, it is about your very own attitude.

Fully disagree -- Fully agree



I am very concerned about the environment and/ or climate change.



It is important that our society as a whole changes consumer behavior to protect the environment.



I consider it as important that the products I use do not harm the environment.



10. Imagine the following hypothetical situation: You are taking part in a game in which you can both win and lose money. We would now like to know from you whether you experience more intense emotions in case of a win or a loss of the below specified amount.

In other words, consider whether the joy of a win would outweigh how upset you would be about a loss.

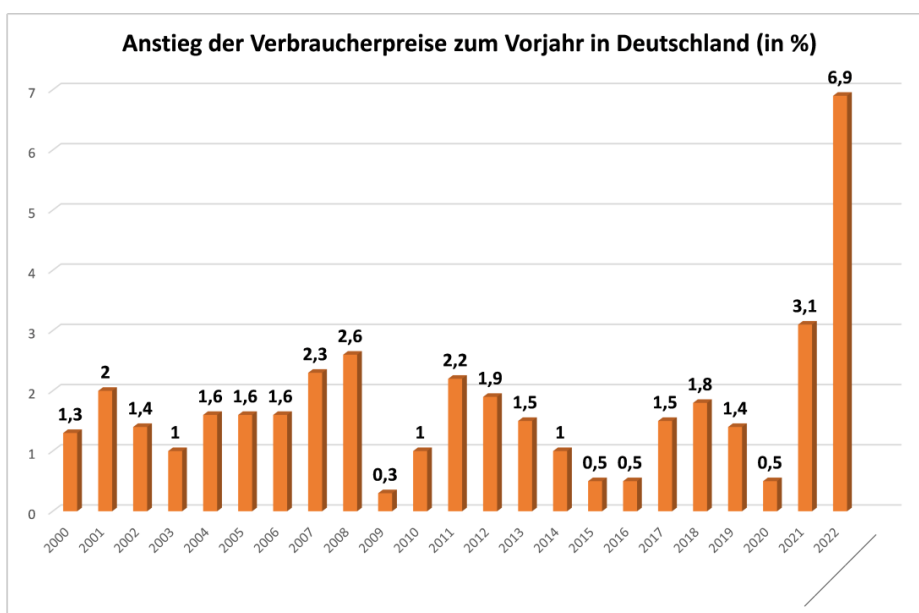
	Profit would have a stronger effect	Profit and loss would have the same effect	Loss would have the stronger effect
Specifically, please consider the following amounts:			
0.50 EUR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 EUR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 EUR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10 EUR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15 EUR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25 EUR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Stage 2: Priming and inflation concerns

Let us now come to the actual core of the study, the topic of consumption.

If you look at the development of consumer prices since 2000, the inflation rate of 6.9% in 2022 has reached historically heights. A slight increase in consumer prices was already observed in 2021 due to Corona, but the war in Ukraine worsened the situation significantly.

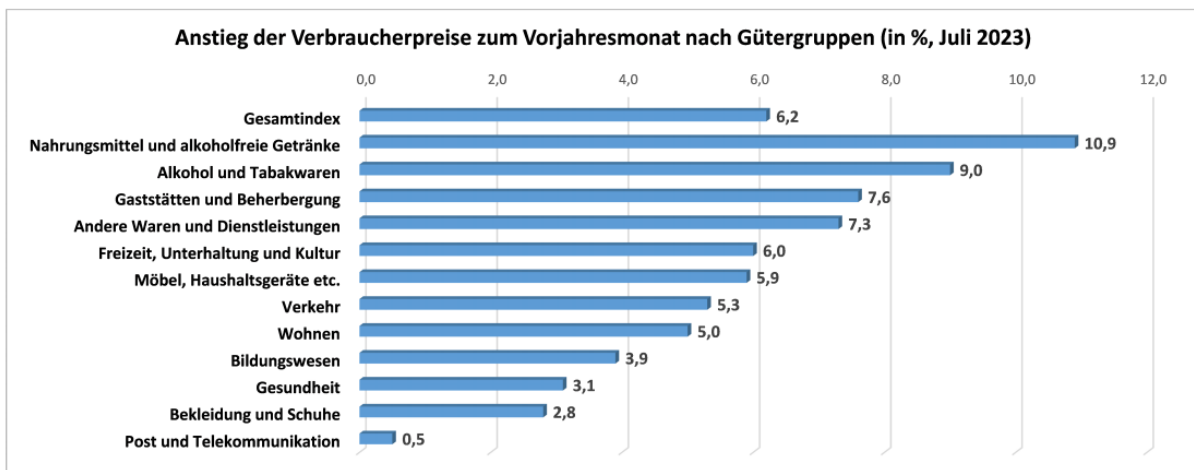
[Increase in consumer prices compared to the previous year in Germany (in %)]



Although monthly inflation rates have recently stabilized somewhat, they remain at a high level. Food and non-alcoholic drinks in particular show an increase of 10.9% compared to the same month last year. Particular food items, such as sugar with 72.3%, have shown a drastic price increase, which in turn affects entire product groups such as sweets. And also those who want to go on vacation by taking the plane have to struggle with significant price increases. International flights in the first half-year of 2023 are by 24.9% more expensive than in the same period of the previous year.

[Increase in consumer prices compared to the same month of the previous year by product groups (in %, July 2023)

From top to bottom: Aggregate index, food and non-alcoholic drinks, alcohol and tobacco, restaurants and hotels, other goods and services, leisure time/ recreation/ culture, furniture and household appliances, transport, accommodation, education, health, clothes and shoes, postal and telecommunication services]



Source of the two figures: German statistical office

Given these numbers, it is not surprising that the majority of the population (69%) agrees that they pay a lot of attention to the price when buying everyday items. Hence, this value remains basically at its record high (70%) that was recorded in September 2022.

Source: Survey on the current situation in Germany, July 2023, infas quo

Please answer the following questions:

11. Do you currently have to limit your spending to compensate for the price increases of the last year/ months?

If you live in a household with other people, the question also applies to your household.

- Yes, I have to limit myself a lot
- Yes, I have to limit myself a little bit
- No, I can cover that from my monthly income, probably in the future as well
- I haven't had to limit myself yet, but I will probably reduce my spending in the future

- While I wouldn't have to limit myself, I did limit my spending in order to save some money

12. If you have limited your spending or are planning to do so in the future, in which areas does this apply?

Multiple answers are possible. Under “Other” you can specify different areas, simply separate them with a comma.

- Groceries
- Clothing
- Vacation
- Free time activities
- Café and restaurant visits
- Other:

- Does not apply.

13. Overall, how concerned are you about inflation and energy costs?

I am ...

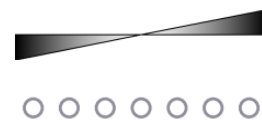
- not concerned
- somewhat concerned
- very concerned

Stage 3: Organic product consumption

The range of organic products is constantly growing, including in supermarkets and discounters. We have a couple of questions about this topic too:

14. To what extent do you agree with the following statement?

Fully disagree -- Fully agree

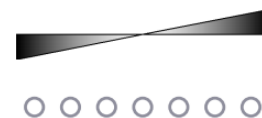


If available, I buy organic products.

15. And to what extent do you agree with the following statement?

If you never buy organic products, please indicate “Not applicable”.

Due to the high inflation rates, I have recently bought fewer organic products.



16. Where and how often do you buy organic products?

	never	occasionally	regularly
Bio supermarket (e.g. Denn's, Alnatura)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supermarket (e.g. Edeka, Rewe)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discounter (e.g. Aldi, Lidl)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weekly market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providers of organic boxes (or similar)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. If you choose organic products, which reasons play a role for your choice?

Multiple answers are possible. If you never buy organic products, you can of course skip this question.

- Own health (preferably natural foods avoiding pesticide and antibiotic residues)
 - Taste
 - Climate protection (e.g. lower greenhouse gas emissions) and preservation of biodiversity (e.g. old fruit varieties)
 - Social standards and fair income for the producer
 - Animal welfare
 - Relatives and friends mainly buy organic products
 - Miscellaneous
-

Stage 4: Norm information

The agriculture and food sector uses approximately 70 percent of water and is responsible for about a quarter of all greenhouse gas emissions worldwide. Our food system also has a significant impact on biodiversity. Around 70 percent of the loss of biodiversity and 75 percent of deforestation can be attributed to the one-sided production of food and feed in conventional agriculture.

Organic farming, on the other hand, relieves pressure on water and soil by eliminating the use of synthetic chemical pesticides and easily soluble mineral fertilizers. This promotes the biological diversity of plants and animals and the fertility of the soil. Less pesticide residues also benefit our health.

If you would like to get an even better overview about the topic of organic food, a 3-minute video provided by the Umweltinstitut München e.V. offers this opportunity to you via this [Link](#).

Sources: European Parliament, WWF, Umweltbundesamt.

Zusammengefasst: Vorteile von Bio-Produkten

Gut für den Geschmack

Gut für unsere Gesundheit

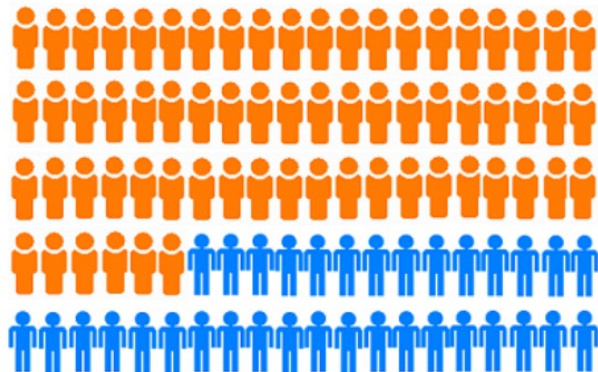
Gut für die Natur

Gut für die Tiere

Gut für das Klima

A recently conducted representative survey of the German population with almost 1,200 participants showed that a clear majority is of the opinion that Germans should buy a larger proportion of organic food in the future.

66% aller Befragten gaben an, dass zukünftig mehr Bio-Produkte gekauft werden sollten



[66% of all respondents indicated that more organic products should be bought in the future]

18. Are you planning to buy more organic food in the future?

- Yes
- No
- Only when the prices for food and energy have stabilized or fallen slightly again
- I already buy mostly organic food

Stage 5: The shopping stage

As promised, you can now fill your shopping cart with groceries. If you click on the link further down ("To the REWE supermarket"), **a new browser window will open in which you can fill your shopping cart.** The survey page (i.e., this one) remains open in the meantime, so you can jump back and forth between the two windows and read the explanations again.

Below you will find further information about filling your shopping cart. **On the next page, we will explain to you how to deliver the information about your shopping cart to us.** So it is best to stay on this page until you have filled your shopping cart, then click on "Continue" at the bottom of the page.

After you have clicked on the link to the online site of the supermarket, **please click on "Pickup service" as shown in the first image below** and you can get started and fill your shopping cart. The shopping cart should correspond to your typical weekly shopping basket and has to meet two criteria in order for you to receive the expense allowance of 20 euros and to be eligible to win the shopping cart:

- **At least 10 different products** have to be in your shopping cart.
- The shopping cart can be filled up to a **maximum amount of 120 euros.** *[Depending on the treatment, the basket could be filled by an amount of 80 or 120 euros.]*

Please note:

1. Don't complete the purchase! We do not refund purchases you have made yourself. We will draw 10 people from among all participants for whom **we** will make the purchase. We will then deliver the corresponding shopping cart to your home after prior arrangement.

2. Do not choose another REWE store!

Now you can get started, please head to the REWE online shop! *[Link to supermarket was provided here]*

All steps briefly and concisely summarized once again:

- Open the link to the REWE supermarket
- Click on pick-up service (see info image)
- Fill your shopping cart (at least 10 different products, maximum 120 euros), which should correspond to a typical weekly shopping basket
- At the end of the survey page, click on "Continue" to find out how you can send us the information concerning your shopping cart

[In the following, we repeated the instructions above by showing screenshots of the supermarket website to the participants. They were shown where to click on the pick-up service, how to fill the shopping cart online by using filters for specific product groups and where they would see the value of their basket.

We then provided detailed and step-by-step instructions how to save a pdf of their shopping cart and upload it via the survey tool. We provided different options to generate a pdf (i.e., via STRG + P or via the print function and offered instructions for MacOS users as well).]

19. Please now upload the pdf of your shopping cart, which contains all items of your basket.

[Participants could now upload a pdf of their shopping cart, which they previously saved on their device.]

Stage 6: General concerns and study end

20. About which topic are you currently most concerned?

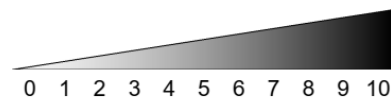
Answer: _____

- I am actually not very worried.

21. On a scale from 0 to 10, how concerned are you about the topic you previously mentioned?

If you have not mentioned a specific topic, please select “Does not apply.”

Not at all concerned – Very concerned



- I am
- Does not apply.



You have now completed the survey. We would like to thank you very much for your help. Please note the following code before clicking “Next”. Without this code, we cannot pay you any expense compensation.

22. If you would like to take part in the shopping cart raffle, we now need your email address. This address is stored separately and cannot be assigned to the information you previously provided. It is therefore important that you keep the saved PDF of your shopping cart so that you can send it to us by email if you win. This procedure serves to ensure the anonymity of your participation in the study.

Please only use the email address you used to register for this study. If individual products in your shopping cart are not available, we will try to replace them with products that are as similar as possible.

Email address: _____

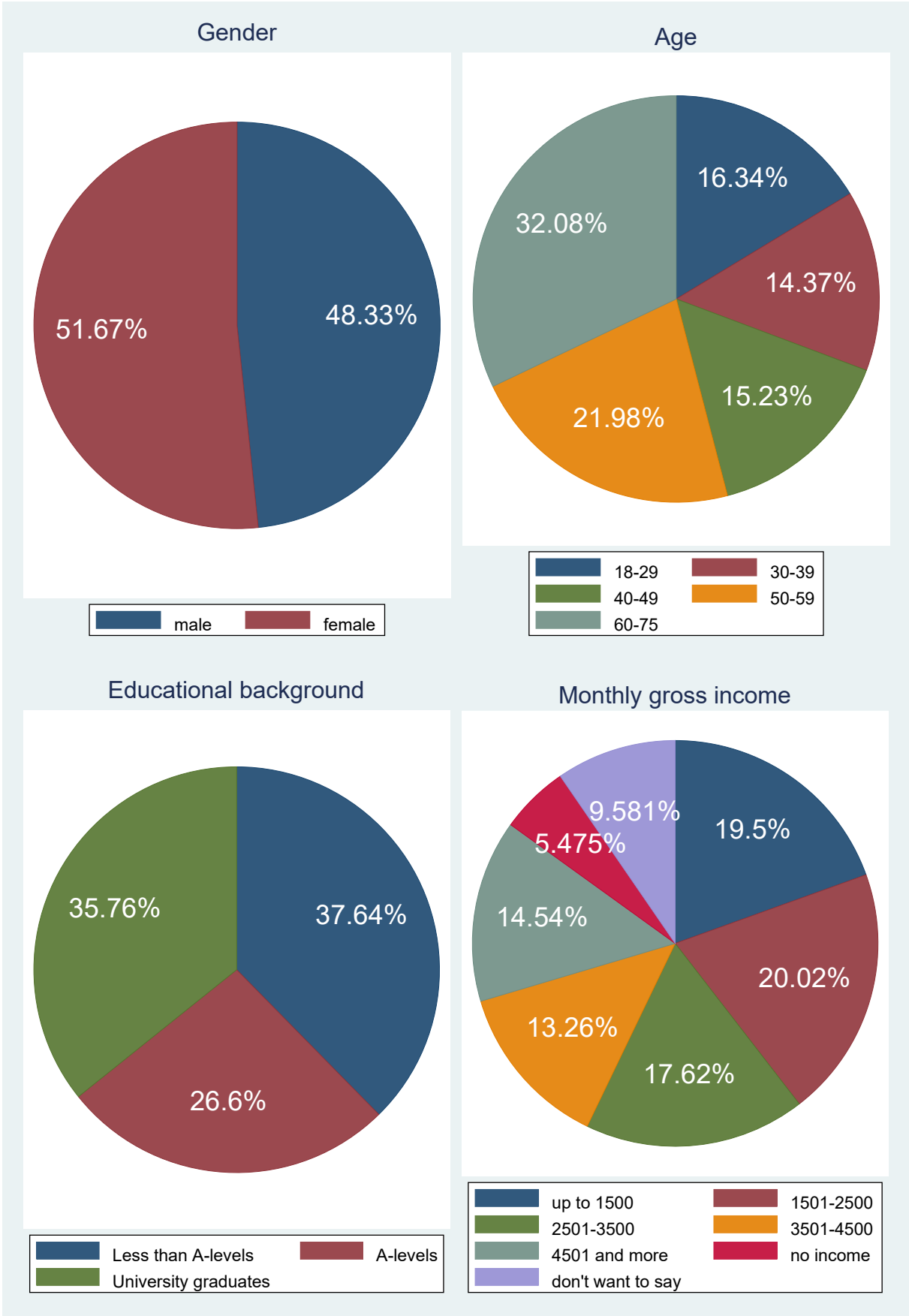
To request your expense allowance or a donation in the amount of your expense allowance, please click on the following link, which will take you to a separate website:

[Website link]

You can now close this browser window, as well as the browser window of the REWE online shop.

B Figures

B.1. Survey: Respondents' characteristics



C Tables

C.1. Survey regression results (all controls)

	(1) <i>Full sample</i>	(2) <i>Full sample</i>	(3) <i>Environmental attitude: low</i>	(4) <i>Environmental attitude: high</i>
Environmental attitude	0.350*** (0.0790)	0.349*** (0.0690)	0.202** (0.0998)	0.715*** (0.170)
Perceived responsibility	0.0324 (0.0684)	0.0338 (0.0680)	-0.0136 (0.0995)	0.0912 (0.0975)
Behavioral efficiency	0.138* (0.0761)	0.138* (0.0762)	0.174* (0.101)	0.0983 (0.121)
Social environment	0.269*** (0.0450)	0.265*** (0.0447)	0.330*** (0.0723)	0.216*** (0.0600)
Female	0.0371 (0.100)	0.0289 (0.0996)	-0.143 (0.146)	0.158 (0.143)
Age cohort: 30-39	0.284* (0.167)	0.281* (0.166)	0.147 (0.236)	0.405* (0.245)
Age cohort: 40-49	0.201 (0.175)	0.190 (0.176)	0.401* (0.242)	0.0163 (0.268)
Age cohort: 50-59	0.109 (0.160)	0.0980 (0.158)	0.124 (0.224)	0.0289 (0.236)
Age cohort: 60-75	0.101 (0.189)	0.0792 (0.189)	-0.0851 (0.301)	0.0826 (0.263)
Having children (yes/no)	-0.0730 (0.101)	-0.0809 (0.100)	0.0826 (0.147)	-0.197 (0.141)
A-levels	0.0857 (0.124)	0.0987 (0.122)	0.0507 (0.171)	0.161 (0.182)
University graduate	0.418*** (0.124)	0.429*** (0.122)	0.294 (0.186)	0.517*** (0.165)
<i>Concerns about:</i>				
Public debt	-0.00765 (0.0756)			
Increasing societal division	0.0712 (0.0824)			
Personal health	-0.0126 (0.0724)			
Military conflicts	-0.0320 (0.0716)			
Pensions and old age poverty	-0.0404 (0.0802)			
Climate change & natural disasters	0.00105 (0.0926)			
German competitiveness	-0.0183 (0.0774)			
Inflation & energy costs	-0.185** (0.0924)			
Digital security	-0.0437 (0.0853)			
Wage: 1501-2500	-0.0867 (0.151)	-0.0804 (0.149)	-0.107 (0.207)	-0.126 (0.225)
Wage: 2501-3500	-0.109 (0.165)	-0.114 (0.163)	-0.0223 (0.246)	-0.172 (0.232)
Wage: 3501-4500	0.0342 (0.190)	0.0265 (0.187)	0.210 (0.266)	-0.100 (0.276)
Wage: 4501 and more	0.187 (0.201)	0.180 (0.197)	0.240 (0.300)	0.0993 (0.281)
Wage: No own income	0.159 (0.223)	0.163 (0.224)	0.345 (0.369)	0.00391 (0.297)
Wage: Don't want to say	0.0766	0.0721	0.0570	0.0784

	(0.175)	(0.174)	(0.238)	(0.268)
Part-time employed	0.350**	0.351**	0.482**	0.260
	(0.154)	(0.151)	(0.231)	(0.202)
Student	0.304	0.299	0.730**	0.00499
	(0.212)	(0.210)	(0.324)	(0.308)
Retired	-0.206	-0.199	0.0392	-0.408*
	(0.180)	(0.179)	(0.275)	(0.242)
Not employed	0.0480	0.0452	0.263	-0.162
	(0.199)	(0.198)	(0.282)	(0.294)
Self-employed	-0.0838	-0.0882	0.0862	-0.213
	(0.212)	(0.211)	(0.349)	(0.278)
Conscientiousness	-0.0247	-0.0262	-0.0357	-0.0233
	(0.0500)	(0.0492)	(0.0703)	(0.0714)
Extraversion	-0.0239	-0.0233	-0.0448	-0.0275
	(0.0381)	(0.0379)	(0.0618)	(0.0497)
Agreeableness	-0.0402	-0.0369	-0.0194	-0.0460
	(0.0509)	(0.0504)	(0.0782)	(0.0671)
Openness	0.176***	0.176***	0.140**	0.193***
	(0.0421)	(0.0411)	(0.0593)	(0.0610)
Neuroticism	-0.0682	-0.0760*	-0.0822	-0.0740
	(0.0418)	(0.0400)	(0.0589)	(0.0577)
Hamburg	-0.0669	-0.0690	-0.00854	-0.0843
	(0.401)	(0.398)	(0.648)	(0.494)
Niedersachsen	-0.121	-0.116	0.190	-0.391
	(0.278)	(0.274)	(0.437)	(0.368)
Bremen	0.125	0.151	0.432	-0.196
	(0.384)	(0.374)	(0.485)	(0.504)
Nordrhein-Westfalen	-0.190	-0.195	-0.0532	-0.320
	(0.261)	(0.257)	(0.420)	(0.342)
Hessen	-0.0241	-0.0263	0.286	-0.279
	(0.286)	(0.283)	(0.462)	(0.374)
Rhineland-Pfalz	-0.468	-0.471	-0.774	-0.211
	(0.309)	(0.304)	(0.479)	(0.392)
Baden-Württemberg	0.0564	0.0496	0.258	-0.135
	(0.275)	(0.271)	(0.447)	(0.358)
Bayern	0.0564	0.0582	0.140	-0.00763
	(0.265)	(0.261)	(0.421)	(0.346)
Saarland	-0.495	-0.478	-0.0869	-0.701
	(0.480)	(0.481)	(0.583)	(0.820)
Berlin	-0.0652	-0.0720	0.0591	-0.224
	(0.314)	(0.309)	(0.479)	(0.422)
Brandenburg	-0.491	-0.496	-0.282	-0.843
	(0.360)	(0.350)	(0.475)	(0.605)
Mecklenburg-Vorpommern	-1.213***	-1.211***	-0.654	-1.589***
	(0.369)	(0.367)	(0.523)	(0.547)
Sachsen	-0.112	-0.129	0.174	-0.397
	(0.325)	(0.319)	(0.468)	(0.467)
Sachsen-Anhalt	-0.250	-0.250	0.135	-0.567
	(0.363)	(0.361)	(0.571)	(0.491)
Thüringen	-0.316	-0.307	-0.452	-0.196
	(0.339)	(0.337)	(0.510)	(0.496)
Inflation: Somewhat concerned		-0.272	-0.411	-0.0737
		(0.201)	(0.332)	(0.246)
Inflation: Highly concerned		-0.480**	-0.664**	-0.268
		(0.202)	(0.328)	(0.252)
Constant	0.440	0.514	1.035	-1.623
	(0.540)	(0.552)	(0.830)	(1.107)
<i>N</i>	1169	1169	543	626
Adjusted <i>R</i> ²	0.363	0.366	0.237	0.197

Notes: OLS estimates. The dependent variable is respondents' answer on organic product purchase behavior ranging from 1 to 7, where (1) 7 indicates that respondents (do not agree) completely agree to buy organic products if available. Column

1 includes controls on different types of concerns. Columns 2-4 only include dummy variables for concerns about inflation and energy costs, the reference category is “not concerned at all”. Columns 3 & 4 split the sample into respondents showing below versus above median environmental attitudes. Additional controls are the Big Five personality traits, the federal state, wage and employment status. Robust standard errors are shown in parentheses. Significance levels are denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

C.2. Field experiment: Randomization check

	Control	Money	M+Norm	Prime	MN+Prime	p-value
Age	33.250	34.567	32.743	33.319	35.354	0.702
Female	0.677	0.708	0.653	0.638	0.677	0.867
Household size	2.410	2.142	2.337	2.510	2.091	0.247
Full-time employed	0.370	0.434	0.337	0.457	0.404	0.423
University graduate	0.510	0.425	0.564	0.362	0.475	0.048
Inflation concerns	1.310	1.160	1.198	1.128	1.152	0.332
Environmental attitude	5.123	5.299	5.231	5.202	5.104	0.501

Notes: The p-values are based on the Kruskal-Wallis test and Chi² test, respectively.

Halle Institute for Economic Research –
Member of the Leibniz Association

Kleine Maerkerstrasse 8
D-06108 Halle (Saale), Germany

Postal Adress: P.O. Box 11 03 61
D-06017 Halle (Saale), Germany

Tel +49 345 7753 60
Fax +49 345 7753 820

www.iwh-halle.de

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