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The causal effect of religious and environmental identity on green preferences: A combined priming and stated choice experiment

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February 2019

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Abstract

Using a stated choice experiment, we find that a prime that makes environmental identity salient makes people behave greener, whereas it does not if it makes religious identity salient. Furthermore, we discover non-linear priming effects for environmental identity, which means that raising the salience of highly environmentally oriented respondents or respondents without environmental identity does not change behavior while it does for respondents with a medium level strength of identity. Methodologically, our study combines for the first time a priming experiment with a stated choice (SC) experiment and uses a respondent specific status quo alternative in the empirical analysis with mixed logit models.

Keywords: Climate change, religious and environmental identity, green electricity, renewable energy, priming, stated choice experiment, mixed logit models

JEL: Q42, Q54, A13, C25, Z12

1. Introduction

The identity of each person is manifold, including for example professional identity, familiar identity, ethnic identity, religious identity, and environmental identity. Depending on the specific situation, some of these identities are more salient than other identities, and thus, some of the values and norms connected to the specific identities are reflected more strongly in our behavior in specific situations (e.g. Benjamin et al., 2016). Several empirical studies reveal the high relevance of values and norms in this respect, for example, for activities on financial markets (e.g. Kaustia and Torstila, 2011, Hong and Kostovetsky, 2012) or contributions to charities (e.g. Harbaugh 1998, Ariely et al., 2009). In view of increasing ecological problems and especially climate change, many economic analyses of contributions to public goods specifically refer to the protection of the natural environment. In fact, empirical studies on green preferences and behavior also show that values and norms play an important role (e.g. Kotchen and Moore, 2008, Welsch and Kühling, 2009, Videras et al., 2012, Araghi et al., 2014, Schwirplies and Ziegler, 2016, Lange and Ziegler, 2017, Ziegler, 2017a).

However, these studies mainly consider correlations and might suffer from confounding variables or reversed causality. In order to identify a causal effect, it is possible to apply a method from social psychology, called priming, which is increasingly used in economics (e.g. Hoff and Pandaey, 2006, 2014; Benjamin et al., 2010, 2016; Afridi et al., 2015; Cohn et al., 2014, 2015, 2018). We contribute to the literature on priming in two ways. The first contribution is the application of the priming technique for raising the saliency of religious and environmental identities in order to identify causal effects on green preferences. Our econometric analysis is based on previous experimental studies on religious identity (e.g. Benjamin et al., 2016; Duhaime, 2014; Malhotra, 2010) and identities closely related to environmental identity (e.g. Johe and Bhullar, 2016; Unswoth and Fielding, 2014) which, however, do not consider green preferences or behavior. Our second contribution to the priming literature is a methodological contribution, as we combine for the first time the priming instrument with a stated choice (SC) experiment that refers to the choice among different electricity contracts comprising especially green attribute levels. The inclusion of an SC experiment allows a higher realism in the analysis of preferences compared with abstract experiments or also simple questions as in most previous studies. In addition to that, our SC experiment is based on a representative sample, which is in sharp contrast to previous priming studies that are mostly based on lab experiments with students (e.g. Benjamin et al., 2010, 2016, Joireman et al., 2010, Mc Leish and Oxoby, 2011, Chen et al., 2014, Liu et al., 2014, Posten et al., 2014) or on experiments with selected population groups such as prisoners (e.g. Cohn et al., 2015a), bank employees (e.g. Cohn et al., 2014,

2015b, 2017), or school students (e.g. Hoff and Pandey, 2014, Afridi et al., 2015) so that the external validity and generalizability (e.g. Fehr et al., 2003, Horton et al., 2011, von Gaudecker et al., 2012) of the results is ambiguous. Other studies with data from broader populations (e.g. Di Tella et al., 2012, Callen et al., 2014, Johe and Bhullar, 2016) and even more reliable framed or natural field experiments (which are very scarce so far, e.g. Li et al., 2017, Kessler and Milkman, 2017) are still restricted in terms of representativeness.

We also contribute to the literature on green preferences and behavior, and especially to the literature on the choice of green electricity contracts. In Germany, the electricity market is liberalized such that almost every household could freely choose between different electricity providers and different electricity contracts. The most decisive features of electricity contracts are the price and the electricity mix that describes the share of the different electricity sources such as nuclear, fossil, or renewable energies (e.g. Keanzig et al., 2013). We specifically consider electricity mixes only containing renewable energies (green electricity), which are obviously an important component of environmental protection. While only a few analyses are based on the actual demand for green electricity (e.g. Kotchen and Moore, 2007, Ziegler, 2017b), most previous studies consider stated preferences and the willingness to pay (WTP) for green electricity by using contingent valuation (CV) methods (e.g. Whitehead and Cherry, 2007, Bollino, 2009, Grösche and Schröder, 2011, Mozumder et al., 2011) and especially SC experiments with respect to policies for electricity (e.g. Longo et al., 2008, Yoo and Ready, 2014, Boeri and Longo, 2017) or with respect to electricity contracts (e.g. Goett et al., 2000, Roe et al., 2001, Amador et al., 2013, Tabi et al., 2014, Murakami et al., 2015, see also the meta-analyses in Ma et al., 2015, and Sundt and Rehdanz, 2015). While several aforementioned CV and SC studies examine the relevance of individual characteristics including environmental attitudes, values, and norms (i.e. Longo et al., 2008, Mozumder et al., 2011, Amador et al., 2013, Tabi et al., 2014, Yoo and Ready, 2014, Murakami et al., 2015, Boeri and Longo, 2017) on the WTP for green electricity mixes, their statistical and econometric approaches are not able to identify causal effects as discussed above. Furthermore, none of the studies examines the effect of religious values and norms.

Regarding our SC experiment, we also contribute to the methodological literature on the design of SC experiments. Our SC experiment on three hypothetical and the status quo electricity contract of our respondents comprises five attributes, especially including the annual electricity costs and the electricity mix of the contract. The annual electricity costs in the SC experiment reflected variations of the stated (and partly verified) last year's electricity bills of the respondents and the status quo alternative attribute levels are added through an online research based

on the stated actual electricity provider and contract names for the empirical analysis. The level of customization of the SC experiment is outstanding in the literature.

Our econometric analysis with flexible mixed logit models especially reveals high preferences for the exclusion of nuclear energy and for the inclusion of renewable energies in the energy mix, especially from electricity providers only selling electricity from renewable energy sources. By interacting the priming variables for religious and environmental identities (that refer to the randomized assignment to the priming treatment or control groups) with the electricity mix variables, the causal effect of religious and environmental values and norms on the preferences for green electricity mixes are examined. As expected, priming the concept of environmental protection has a significantly positive effect on the (stated) preference for green electricity mixes. In particular, we find a non-linear priming effect, i.e. that the priming effect is driven by individuals with a medium underlying environmental identity, while it does not affect individuals with either low or high identity (see Benjamin et al. 2016 for a theoretical framework incorporating possibly non-linear priming effects). In contrast, religious priming has no significant effect on preferences for green electricity mixes, independent from the religious strength of the respondents.

The remainder of the paper is organized as follows: Section 2 gives an overview on the literature and derives hypotheses. Section 3 discusses the experimental setting of our empirical analysis comprising the SC experiment and the inclusion of the priming instrument. Section 4 explains the econometric approach and discusses the estimation results. Section 5 discusses the results and draws conclusions.

2. Literature review

Identity theory (e.g. Akerlof and Kranton, 2000) suggests that individuals have different social identities (e.g. gender, ethnicity, social status) that are connected with values and norms. Accordingly, social identities can influence behavior since activities which are not compliant with the corresponding values and norms can lead to psychological costs and thus to a loss in utility. Based on that, Benjamin et al. (2010, 2016) conclude that the stronger ones identity, the closer is its behavior to the social norm. Regarding religious identity, some previous studies (see e.g. the overview in Renneboog and Spaenjers, 2012) show that religious values, norms, and identity can affect individual preferences and behavior, for example, savings (e.g. Guiso et al., 2003, Arruñada, 2010), risk preferences and behavior (e.g. Barsky et al., 1997, Hilary and Hui, 2009, Kumar et al., 2011, Shu et al., 2012), trust (e.g. Chuah et al., 2016), or hours worked (e.g.

Spenkuch, 2017). Similar to Tan (2006), who cannot generally reveal significant effects on social preferences, the results of the few studies on green preferences and behavior are also ambiguous.[1] While Owen and Videras (2007) report positive effects of (Christian) religious values in several OECD regions, Martin and Bateman (2014) find that religious values have no significant effects on individual green behavior in the USA and Cui et al. (2015) even show that firms that are located in US counties with high shares of Christians and especially Protestants show less environmental practices. While the latter result is in line with the dominion hypothesis that implies a negative correlation between Christian religiosity and green behavior on the basis of the early work of White (1967) who suggests an anthropocentric worldview, the stewardship hypothesis implies a positive correlation on the basis of the teachings of Christian religions.

Regarding environmental identity, several studies show the positive correlation of environmental values and norms with diverse green activities (e.g. Videras et al., 2012) or specifically with the participation in green electricity programs (e.g. Kotchen and Moore, 2007), the reduction of electricity use (e.g. Kotchen and Moore, 2008, Delmas and Lessem, 2014), the willingness to purchase green electricity (e.g. Attari et al., 2009), the probability to live in solar homes (e.g. Dastrup et al., 2012), energy saving measures (e.g. Fischbacher et al., 2015), carbon offsetting (e.g. Schwirplies and Ziegler, 2016), or the willingness to pay higher prices for climate-friendly products (e.g. Ziegler, 2017a). However, Fischbacher et al. (2015) report insignificant effects of environmental values in some of their econometric specifications, and in Whitmarsh and O'Neill (2010) as well as Ziegler (2017b) environmental values and norms never have significant effects on green behavior.

Based on the theory and the empirical results, we derive the following hypothesis:

> *H1.1a: There is a positive correlation between a Christian religious identity and green behavior.*
>
> *H1.1b: There is a negative correlation between a Christian religious identity and green behavior.*
>
> *H1.2a: There is a positive correlation between a environmental identity and green behavior.*

[1] Another important direction of studies consider the effect of religious values on more general sustainable behavior, especially on financial markets, i.e. with respect to socially responsible or controversial investments (e.g. Salaber, 2013, Hood et al., 2014, Kumar and Page, 2014, Borgers et al., 2015, Gutsche et al., 2016)

The partly contradicting results on the influence of identity, norms and values, point to a general problem of previous studies since the identification of causal effects is difficult with standard econometric techniques. One important endogeneity problem is that the (significant) correlation between religious or environmental values and green preferences and behavior can be influenced by unobserved factors (e.g. childhood home environment or general socialization) which are correlated with both the dependent and the explanatory variables (e.g. Shariff and Norenzayan, 2007, Benjamin et al., 2016). Another problem refers to the direction of the effects (e.g. Videras et al., 2012). While it is possible that environmental values and norms causally affect green preferences and behavior, it is also possible that these values have developed after some experiences with green behavior. For these reasons, the use of the priming instrument is attractive. Priming raises (at least temporarily) the saliency of an identity with a social category or with values and norms by activating mental concepts through subtle situational cues (e.g. Cohn et al., 2017). On this basis, the causal (marginal) effect of the primed identity, i.e. the corresponding values, or norms (or also stereotypes that are associated with an identity such as for ethnicity or gender, e.g. Shih et al., 1999) on preferences and behavior can be analyzed without the confounding influence of other unobserved factors. Against this background, the priming technique is increasingly used in economic experimental studies (see e.g. the overview in Cohn and Maréchal, 2016). While studies mainly concentrate on well defined identities related to preconceptions such as caste identity (e.g. Hoff and Pandey, 2006, 2014), ethnic or race identity (e.g. Benjamin et al., 2010), hokou identity (e.g. Afridi et al., 2015), age identity (e.g. Israel et al., 2014), gender identity (e.g. Boschini et al., 2012; Cadsby et al., 2013; Cubel and Sanchez-Pages, 2017), professional identity (e.g. Cohn et al., 2015, 2015, 2018) or donor identity (e.g. Kessler and Milkman, 2017), only few studies focus on vaguely defined identities such as, pro-social identity (e.g. Andersson et al., 2017), or trust identity (Posten et al., 2014).

Norms and values associated with religious identity are not clearly defined. Thus, several studies try to identify norms and values associated with religion by the use of religious priming, albeit not regarding the environment. In this context, Shariff and Norenzayan (2007) examine the effect of priming religious identity of Canadian students and other citizens on generosity in an (incentivized) dictator game and Mazar et al. (2008) analyze (in one of their experiments with US students) the corresponding effect on cheating. Furthermore, Hilary and Hui (2009) consider (besides their main analysis) the effect on risk preferences, Malhotra (2010) examines effects on online charity auctions and Horton et al. (2011) consider the effect on cooperation in a prisoner's dilemma game among MTurk participants. Ahmed and Salas (2011) examine the effect of priming religiosity among students in Chile on generosity in a dictator game and on

cooperation in a prisoner's dilemma game. Duhaime (2014) considers the Islamic call to prayer as a prime for pro-social behavior. Recently, Benjamin et al. (2016) extensively analyze the effect of priming the religious identity of US students on contributions to public goods, risk preferences, time preferences, generosity, and work ethic, which are measured in several standard experiments, respectively.

In contrast to religious identity, environmental identity is a rather vague concept but clearly connected to the norm to behave environmentally friendly. Probably due to the vague definition of environmental identity, the literature on environmental priming is very limited. Di Tella et al. (2012) consider the effects of primes that refer to government propaganda against privatization on the (stated) preferences of household heads in Argentina for water privatization. Furthermore, Viscusi and Zeckhauser (2006) consider students in the USA and examine the effects of primes to increase climate change accessibility by neutral background information on expected temperature increases in the future. With respect to a stronger relation to green preferences, Viscusi and Zeckhauser (2006) also analyze the effects of their primes on the willingness to pay a climate change gas tax and Joireman et al. (2010) examine the effects of priming with words related to heat on climate change beliefs among US students. In addition, Unsworth and Fielding (2014) consider the effects of priming political identity on climate change beliefs and the support of climate policies among Australian students (in one experiment) and among citizens across Australia (in another experiment). Recently, Johe and Bhullar (2016) examine the effects of priming organic and environmental identity of citizens in an Australian region on intentions to purchase organic products. However, none of the studies considered the effect of environmental identity on environmental behavior.

Based on the theory and the empirical results, we derive the following hypothesis:

> *H2.1a: There is a positive causal effect of Christian religious identity on green behavior.*
>
> *H2.1b: There is a negative causal effect of Christian religious identity on green behavior.*
>
> *H2.2a: There is a positive causal effect of environmental identity on green behavior.*

Most of the cited studies showed that there is an effect of several identities on different behaviors. However, several studies also report different priming effects for different population groups. For example, Benjamin et al. (2010) show different effects of priming ethnicity and race for different ethnicities and races, Chen et al. (2014) reveal different effects of priming ethnicity and common organization identity among different ethnicities, while Liu et al. (2014)

show different effects of the same Confucian primes in China and Taiwan. In addition, Boschini et al. (2012) show different effects of gender priming for males and females and Hoff and Pandey (2014) and Afridi et al. (2015) reveal different effects of priming social status among individuals with different social statuses, respectively. Furthermore, Li et al. (2017) shows (for women) that the same priming of local neighborhood identity has different effects in a neighborhood where the local identity is associated with a positive social image and in a neighborhood where the local identity is associated with a negative social image. Cohn et al. (2015b) show a significantly positive effect of priming the criminal identity of prisoners on cheating, whereas this priming has no significant effect for male visitors of a resident registration office without a criminal identity. Similarly, Cohn et al. (2014, 2017) show that priming the professional identity in the banking industry leads to a significant increase of cheating and a decrease of risk-taking, whereas the priming of professional identity has no significant effects for employees from other industries (i.e. without a banking identity). Similarly, Kessler and Milkman (2017) reveal that the positive effects of priming generosity (i.e. previous donations) and local identity on donations are significantly higher in the case of stronger associations with the underlying norms. In the religious context, Benjamin et al. (2016) show that priming effects on public good contributions differ by religious affiliation and Harrison and Michelson (2015) find that religious priming is not universally effective across respondents and especially that priming increases the likelihood to support same sex marriage only for religious individuals. In the environmental context, Viscusi and Zeckhauser (2006) report that the effects of primes to increase climate change accessibility on expected temperature increases in the future differ between US students and non-US students. Unsworth and Fielding (2014) report that the effects of priming political identity on climate change beliefs and the support of climate policies differ between right- and left-wing oriented individuals. Benjamin et al. (2010, 2016) developed a theoretical model for the interpretation of the different priming effects. They conclude that priming increases the strength of one's identity and thus shifts behavior towards the norm of the primed identity. However, priming has diverse effects on behavior depending on the strength of identity or status quo level of behavior. Thus, if the person does not have the primed identity or if the unprimed behavior is already in line with the social norm, there will be no priming effect. This, however, does not rule out the existence of a causal effect of the norm. While the cited empirical literature shows that priming an individual with a foreign identity does not alter behavior, empirical evidence for the non-linear effect is lacking.

Based on the theory and the empirical results, we derive the following hypothesis:

H3.1: There is a non-linear causal effect of Christian religious identity on green behavior.

H3.2: There is a non-linear causal effect of environmental identity on green behavior.

3. Experimental setting

3.1. Sample

The empirical analysis is based on data from a large-scaled computer assisted web interview (CAWI) among Germans carried out in June and July 2016 by the German branch of the market research company Psyma. With regard to the goal of our study, we only interviewed persons who are at least 18 years old, who are responsible for the electricity bill and who are involved in the choice of the electricity provider and the electricity contract. In order to include all relevant population groups, the sample was stratified in terms of age, gender, place of residence, and religious affiliation by quota sampling using distributions of the German adult population[2]. Furthermore, there was a quality screen out of respondents who completed the survey too slowly or too quickly, a quality screen out if respondents typed in unrealistic values for energy consumption and energy cost, and a quality screen out of respondents who failed to answer a control question[3] correctly. Furthermore, we excluded respondents who stated to have a lower or higher energy consumption than reported by their last electricity bill[4]. The sample was drawn from an online panel[5] administered by Psyma.

The questionnaire included a SC experiment in order to study the preferences for green electricity contracts and a priming experiment in order to examine the effect of green and religious identity on the choice of green electricity contracts. In addition to the SC experiment, the questionnaire covered questions on attitudes and preferences, households' electricity consumption[6], and socio-economic data. We separated questions into blocks to reduce cognitive effort, especially before the SC and priming experiment, as they are cognitively demanding. However, we asked questions about personal beliefs, attitudes and social preferences before the experiments

[2] This sampling strategy can lead to an overrepresentation of other socio-demographic variables e.g. high education. Furthermore, it is not possible to report a response rate, thus there is a risk of non-response bias.
[3] The control question was embedded in a battery of questions regarding the support of the installation of new energy production facilities in the direct neighborhood. Respondents were asked to select the option "fully support" to make sure that respondents are reading the instructions and are still attentive.
[4] Respondents could upload the last years anonymized electricity bill. The data was imputed by the Psyma AG in order to follow data security policies.
[5] Due to the use of the online panel a risk of selection bias exists. However, we cover all important populations groups and the distribution of socio-demographic variables is comparable to the German population.
[6] For that reason, respondents were asked to have their last electricity bill at hand at the beginning of the survey.

to prevent influences through our treatments for this specific part of the survey. Across all participants, the median completion time of the survey was about 28 minutes.

3.2 Stated choice experiment

SC experiments allow to study customer preferences for product attributes or product compositions in a controlled experimental setting (e.g. Kaenzig et al. 2013). In order to examine the preferences for green electricity contracts we used a SC experiment in the online questionnaire. In the SC experiment, respondents faced a sequence of six choice sets where they were asked to choose one out of three unlabeled electricity contracts in a first stage and to choose to between the selected hypothetical contract to their current electricity contract in a second stage. [7]

The hypothetical tariffs were described by five attributes, namely electricity mix, type of electricity provider, location of the provider's headquater, guaranteed share of electricity produced within the own region and annual electricity cost. We selected the five tariff attributes based on the objectives of the study, with reference to actual electricity contracts on the German electricity market and taking into consideration previous research (outlined in section 2 of this paper, e.g. Burkhhalter et al., 2009; Kaenzig et al., 2013).[8] The attributes are described by two to seven distinct attribute values which are combined without constraints so that the total number of possible combinations of these attribute levels is far too big to use a full factorial design. Thus, the experimental design was generated using the Sawtooth software Choice-Based Conjoint component. Table 1 visualizes an exemplary choice set for the SCE. In addition, Figure 1 presents the corresponding original screenshot (in German) of this choice set. Table 1 and Figure 1 also show that the alternatives were unlabeled, which is common practice in similar studies (e.g. Keanzig et al., 2013; Kalkbrenner et al., 2017).

[7] The SC experiment started with a detailed description of the choice situation, including cheap talk scripts to reduce the hypothetical bias (e.g. Cummings and Tylor, 1999; List, 2001). In addition, several terms used for the description of the electricity contracts were defined. The most important definition with respect to our research question refer to the information that a contract with an electricity mix of 100% of renewable energy can be either offered by a provider who only offers contracts with 100% renewables or by a provider who also offers contracts with mixes containing other energy sources such as coal or nuclear energy. Furthermore, we also explained that the annual electricity cost levels were calculated based on the stated last year's electricity cost of the respondent.

[8] In order to reduce ordering effects, the ordering of attributes changed between respondents. However, every participant received the same ordering of attributes over all choice tasks to keep cognitive effort the lowest possible. We decided to forego other contract attributes like price guarantee or cancellation policy in order to reduce cognitive effort and thus exhaustion. Thus, respondents were instructed to assume properties beyond these five attributes to be identical for all displayed contracts. We also informed them that some contracts were currently not available on the marked, but asked them to assume that they actually have the choice between all contracts. Furthermore, we asked respondents to treat their choices as if it were a real contract decision and indicated to consider personal financial constraints for each choice.

Table 2 summarizes the most important attributes and the corresponding status quo attribute levels. In particular, the electricity mix could take on five distinct values and reflects the product range in the German electricity market. The levels are "100% renewable energy from providers only offering electricity from renewable energy sources", "100% renewable energy from providers also offering electricity from nuclear or fossil energy sources", "mix of renewable and fossil energy sources", "mix of renewable, nuclear and fossil energy sources" and "mix of nuclear and fossil energy sources". To elicit the preferences for green electricity mixes, the last category, i.e. the "mix of nuclear and fossil energy sources", is used as base category for the econometric analysis. Furthermore, annual electricity costs vary in the range of – 30% and + 30% with steps of 10 percentage points. The seven price levels reflect the range of electricity prices on the market. In order to avoid unrealistic values and to allow the comparison of the hypothetical tariffs of the choice set with the status quo electricity contract, the electricity costs were given in Euros. The specific values were calculated based on the stated annual electricity cost in 2015.[9]

In addition to the customized cost, we tried to create a choice situation that is close to real conditions (e.g. Johnston et al. 2017) and grounded the experiment to an individual respondent level (e.g. Hensher, 2010) by using the status quo electricity contract of the respondents as the baseline alternative. Thus, in addition to the cost attribute, also the status quo attribute levels differed across individuals. The status quo levels were added to the SC experiment in the analysis stage based on the stated name of the electricity provider and contract.[10] The last column of Table 2 gives an overview on the respondents' status quo electricity mix and cost.[11]

[9] The remaining attributes were defined as follows: For the type of electricity provider, the four attribute values were specified as "energy cooperative", "regional utility", "supra-regional German utility", and "foreign supplier", whereby the latter functioned as base category. Electricity provider's headquater location was defined as "within the own region" or "outside the own region" with, again, the latter as base group. For the guaranteed share of electricity generated within the own region, the attribute values could either take on 0%, 25%, 50%, 75% or 100%.

[10] The information on the attribute levels of the electricity provider and tariff were added based on the information on the contracts at the providers' webpages. If the information on the contracts were not accessible on the webpage, we contacted the providers directly. This was especially relevant for contracts that have been provided years ago and are now substituted by new contracts but are still valid for established costumers.

[11] Due to some missing values for the name of the electricity provider or electricity contract, we had to impute values. Therefore, we did minor corrections (e.g. if name of the electricity provider and electricity contract were mixed up, if a provider did only offer one single electricity contracts) and assumed that an old contract was substituted by its successor contract. In addition, we made stronger assumptions to include respondents who gave unspecific names for their electricity contracts (e.g. for "normal", "classic", "basic" we imputed the basic supply electricity contract or the most often sold electricity contract of the stated provider), or incomplete information on their provider (e.g. we imputed the municipal or regional utility located in the region of the respondent if they only indicated to be contracted with a municipal or regional utility but did not state the complete name of the provider).

3.3 Priming instrument

The empirical investigation of identity effects is difficult, as social identity is often confounded with other individual preferences (e.g. Benjamin et al., 2010). Thus, we use the method from social psychology we introduced in the literature review, namely priming, that allows the examination of causal relationships of identity on economic behavior by an exogenous shock, i.e. a priming task. In general, a priming experiment consists of two stages. A priming task in the first stage and a subsequent task in an unrelated context (e.g. Bargh, 2014). The emphasis of a specific social identity in the first task leads to an emphasis of the norms related to the primed identity and thus behavior tends to get closer to the norm in the second task (e.g. Benjamin, 2010). Thus, by the random treatment it is possible to gain knowledge about the underlining norm connected to the primed social identity.

The priming shock is introduced by a subtle stimulation of a specific social identity, e.g. by revealing identity (e.g. Aifridi et al., 2015; Hoff and Pandey, 2006, 2014), sentence unscrambling (e.g. Benjamin et al., 2016), presenting a picture or video (e.g. Johe and Bhullar, 2016, Israel et al., 2014) or the completion of a questionnaire or writing task (e.g. Gallier et al., 2017; Cohn and Maréchal, 2015, Cohn et al., 2014, 2015, 2018; Cadsby et al., 2013, Callen et al., 2014; Chen at al., 2014; Benjamin et al., 2010). In the current study, we use a writing task because it can be easily applied to a representative survey. The task is especially in line with Callen et al. (2014), who analyze the effect of priming fear and happiness by asking the participants to describe daily experiences. We asked respondents in our treatment groups to accomplish the following tasks after the introduction of the SC experiment and directly before the first choice task of the SC experiment:

> Priming task of the environmental treatment group: *"Before we start the survey, please describe some positive aspects of (private) environmental protection (e.g. in terms of conservation of livelihood of humans, animals and plants, improvement of air, water and soil quality)."*
>
> Priming task of the religious treatment group: *"Before we start the survey, please describe some positive aspects of religion and faith (e.g. in terms of community, safety, afterlife, spirituality)"*

Respondents filled in their answers into one to three free text fields. Answers could be single terms, list of words, or full sentences. In the environmental priming task, respondents named either potential conservation activities or potential consequence of such activities e.g. "preserving the habitat of animals and plants", "fresh air", "increased biodiversity" or "waste separa-

tion". In the religious priming task statements respondents named terms like "solidarity", "community" or "hope".[12] Immediately after the priming task, respondents completed the SC experiment that was explained in detail in the previous section.

4. Econometric analysis

4.1. Econometric approach

A mixed logit model (MXL) is used for the analysis of the SC experiment (Louviere et al., 2000). It allows to incorporate preference heterogeneity across respondents by estimating random parameters, whose distribution is arbitrarily selectable. For example, normally distributed random parameters are characterized by a mean and a standard deviation to be estimated (e.g. Greene and Hensher, 2003). Besides, MXL does not rely on the assumption of independence from irrelevant alternatives, i.e. that choice probability is independent from the introduction of new alternatives (e.g. Train, 2003; Greene and Hensher, 2003). Related to this, MXL is not assuming an independence of choices, which is important as respondents performed six sequential choices. The distribution of random parameters is assumed to be normal for all attributes except yearly costs, which implies that respondents can express both positive and negative preferences for the attributes by making their choices, and both a mean and standard deviation parameter are estimated for each attribute value. In contrast, yearly costs are assumed to be log-normally distributed across respondents. This restricts possible values for the yearly cost parameter to the set of negative real numbers, which impedes the estimation of parameters that contradict economic theory (Train and Weeks, 2005). [13] Interaction terms of the attribute values with socio-demographics, attitudinal measures and treatment dummies are assumed to be fixed. To capture the status quo bias, which is the last year's electricity contract of every single individual, we included an alternative specific status quo dummy variable which takes the value one for the last year's contract and zero for the hypothetical electricity tariffs, and the corresponding estimated parameter is again assumed to be normal to account for unobserved preference heterogeneity. Nevertheless, similar to the problematic extrapolation of results from lab experiments to the field (e.g. Cohn et al., 2015b) our estimations could be biased due to the hypothetical character of the SC experiment and thus not directly be transferred to real behavior.

[12] Please note that answers might be influenced by the examples that we listed in the description of the priming task to clarify the task. However, for the priming experiment it only matters that the respondents thought of aspects of either environmental protection activities or their religion to stimulate the specific identity. Furthermore, please note that in the religious priming treatment there were several respondents who expressed their opposition towards religion instead of naming positive aspects of religion and faith.

[13] We obtain similar results when the econometric model is parametrized in willingness-to-pay-space.

However, in line with Cohn et al. (2015b), we are not interested in the absolute levels of the estimates, but in relative preferences for different levels of the electricity mix and especially in comparative static effects of religious and environmental identity for the treatment and control groups in the priming experiment, which should be unaffected by the possible hypothetical bias (e.g. Goett et al., 2000).

The dependent variable in our econometric analysis is the choice among the three hypothetical electricity contracts and the actual electricity contract of the specific respondent. The five attributes of the SC experiment outlined above act as basis for the explanatory variables. Yearly costs and the guaranteed share of electricity generated within the own region are treated as continuous variables. The annual electricity costs were included as negative of the percentage of the respondents' actual electricity cost of the last year[14]. All remaining attributes contain discrete values, and thus dummy variables for each of the attribute values are generated.

The main purpose of this study is to reveal the causal effects of religious and environmental identity on green behavior expressed by the choice of (green) electricity contracts. In order to analyze identity subgroups, we measure religious as well as environmental identity. To classify respondents into religious identity subgroups, we consider the respondent's self-assessed strength of religiosity. On a symmetric scale with five ordered response categories, respondents could answer with "not at all", "rather weak", "neither strong nor weak", "rather strong", and "very strong". The corresponding dummy variable "strongly religious" takes the value one if respondents selected "rather strong" or "very strong", and else zero.

For environmental identity, we use two different measures, namely environmental awareness and political ecological orientation, in order to capture different concepts of environmental identity. Environmental awareness was measured by using the New Ecological Paradigm (NEP) scale according to Dunlap et al. (2000), which is a standard instrument in the social and behavioral sciences and is increasingly common in economics (see e.g. also Kotchen and Reiling, 2000). In accordance with Whitmarsh (2011), the indicator is based on the stated agreement ("totally disagree", "rather disagree", "undecided", "rather agree", and "totally agree") with respect to the following six statements: "Humans have the right to modify the natural environment to suit their needs", "humans are severely abusing the planet", "plants and animals have the same right to exist as humans", "nature is strong enough to cope with the impacts of modern industrial nations", "humans were meant to rule over the rest of nature", and "the balance of

[14] Including the negative of the cost variable is necessary because the distribution of the parameter for annual costs was assumed to be log-normal, which implies a positive sign for the estimated parameter.

nature is very delicate and easily upset". The variable is designed by constructing dummy variables that take the value one if the respondent rather or totally agrees to the respective statement in the case of positively keying items or if the respondent rather or totally disagrees in the case of negatively keying items. The score is constructed by adding up the six dummy variables. Accordingly, the variable takes values from zero to six. The second variable to capture environmental identity is political ecological orientation. Therefore, respondents were asked on a symmetric five-point scale to assess their strength of agreement to the statement "I identify myself with ecologically oriented policy", with "not at all", "rather weak", "neither strong nor weak", "rather strong", and "very strong" as possible answers. The dummy variable "strongly ecologically orientated" takes the value one if respondents selected "rather strong" or "very strong", and else zero.

To quantify priming effects, it is important that the respective primed and unprimed subgroups are largely equally composed in terms of usual socio-demographic information to avoid possible sampling bias. This is especially true for the socio-demographic characteristics found to be significantly affecting the willingness to pay for green electricity across the corresponding literature, as well as for other possibly influencing variables. Thus, we consider several socio-demographic variables to compare the subsamples. "Catholic", "Protestant", "Muslim", "other religious groups" and "unaffiliated" are dummy variables that take the value one if the respondent identifies with Catholic, Protestant, Islamic, other (including Orthodox), or no religious groups, respectively. "Age" represents the age of a respondent in years, while "female" is a dummy variable that takes that value one if the respondent is a woman. "Annual electricity cost" displays the respondent's household electricity costs of the year before the survey, and "annual electricity consumption" denotes the corresponding electricity consumption. To control for different household sizes, the variables "housing space", which denotes the respondent's housing space in square meters, and "number of persons in household", which counts the number of persons living in the household, are included. "High education" is a dummy variable that takes the value one if a respondent has at least a bachelor university degree. The dummy variable "East Germany" takes the value one if the respective participant lives in the former East German federal states, including Berlin. "High household income" as a dummy variable takes the value one if the respondent's household net income is above the sample median category (2000€ - 2500 Euro). In order to control for socio-demographic effects, age, female, high education and East Germany are also considered in the econometric analysis. To identify our treatment groups, we define the dummy variables "environmental priming treatment" and "religious

priming treatment" that take the value one if the respective respondent was exposed to the corresponding priming treatment and zero otherwise.

Table 3 reports the number of observations and the means and standard deviations of the variables described above. It shows that all three groups are very similar in terms of all incorporated explanatory variables[15]. Unfortunately, no official statistics on the socio-demographic characteristics of decision makers in the field of electricity are available. However, comparing the overall population figures to the sample reveals that there are no major differences in terms of age, gender, power consumption, and the share of citizens in the former East German states, including Berlin (Statistisches Bundesamt 2015c). Household incomes above the mean of the population is underrepresented (Statistisches Bundesamt 2015d). Unfortunately, official statistics collect data on education separated by school-leaving qualification and professional qualification/graduation, whereas the measure in this study only asks for the highest completed level of education. Thus, a comparison with official statistics is not possible in a meaningful way. The mean household size in the sample is slightly higher than the overall German average in 2015 (Statistisches Bundesamt 2015b). While the shares of Catholics and religiously unaffiliated citizens are mainly equal to the general population measures, the share of Protestants is four percentage points higher compared to official member data from the churches (Rat der EKD 2016, Katholische Kirche in Deutschland 2016).

4.2 Estimation results

Basic estimation and correlations in the control sample

Table 4 reports three models of electricity tariff choice in the control group. The left two columns report the estimated mean and standard deviation parameter estimates (including robust z-statistics) for all electricity mix attribute levels, with a mix of fossil and nuclear energy as reference level.[16] All remaining attributes are part of the models, but not shown in detail and summarized as "other attributes" in all Tables , as we focus our analysis on green behavior. All corresponding mean parameter estimates are highly significantly different from zero at the 1% level and thus matter for the choice of electricity tariffs in the SC experiment. As expected, the estimated parameter for the negative of yearly electricity costs is positive, which also applies to the electricity tariff attributes. Comparing the estimated mean coefficients reveals that the

[15] This finding is supported by a multitude of tests to analyse whether there are statistical differences in terms of the included explanatory variables. The corresponding estimation results are available on request.

[16] We conduct our microeconmetric analysis with the help of the software package STATA. We use the command "mixlogit" that was written by Hole (2007) and estimate the coefficients by simulated maximum likelihood using 1000 Halton draws.

respondents on average expressed the highest preferences for 100% renewable energies from a green provider (2.26), while 100% renewable energies from a conventional provider (1.43) ranked second, followed by a mix of renewable and fossil energy sources (1.19), a mix of renewable, fossil and nuclear energy sources (0.50), and a mix of fossil and nuclear energy as the reference level, which is thus also the least-preferred attribute value. In addition, the estimated parameter of 2.36 for the status quo electricity tariff is highly statistically significant and positive. The estimated standard deviations of the random parameters are, with the exception of a mix of renewable, fossil and nuclear mix, all highly significantly different from zero. This implies that unobserved heterogeneity was present among respondents for the corresponding attributes, i.e. that respondents differ significantly in their preferences for the different attributes, especially regarding annual costs and the status quo alternative. Including socio-demographic and attitudinal information into the models can help to partly explain this heterogeneity, and the respective estimation results are depicted columns three to six on the right hand side of Table 4.

The model depicted in columns three and four of Table 4 controls for strength of religiosity, environmental awareness and political ecological orientation by including interaction terms for these variables with each of the electricity mix attribute values. In this context, religiousness has no effect on electricity mix preferences, as the respective estimated parameters for the interaction terms are not significantly different from zero. In contrast, an increasing environmental awareness significantly positively affects preferences for green electricity from green providers. Similarly, an increasing tendency towards ecologically oriented policies has a significant positive effect on the choice of all electricity mixes compared to a mix of fossil and nuclear energy sources, whereby the effect is the strongest for the "greener" mixes[17]. In the third model in columns five and six of Table 4, interactions between socio-demographic variables and the electricity mix attribute values are incorporated into the model to control for possible confounding effects and correlations between attitudinal variables and socio-demographic information, which refers to age, gender, education, income and region. While this leads to slightly different estimates for the interactions between attitudinal variables and attribute values, it is nevertheless clear that the effects are significantly different from zero, especially with respect to the "greener" attribute values. We thus conclude that the incorporated measures reliably capture environmental attitudes.

[17] Note that there is a correlation of about 0.29 between environmental awareness and political ecological orientation. Including only one variable into the model thus leads to increasing z-values (or lower p-values) for the respective interactions.

Priming: linear effects

In the model reported in Table 5, interaction terms of the electricity mix attribute values and the religious and environmental priming treatments are included in addition to the attribute values and the status quo alternative across the entire sample. For the religious priming treatment depicted in column three, no estimated interaction term parameter is found to be significantly different from zero on all common significance levels. However, for the environmental priming treatment depicted in column five, the interaction term parameters are statistically significant for three of the electricity mixes. On the 10%-significance level, participants in the treatment group were more likely to choose a contract with green electricity from a green provider over a mix of fossil and nuclear energy sources compared to participants in the control group. On the 1%-significance level, treated participants were more likely to choose a mix of fossil and renewable energy sources over a mix of fossil and nuclear energy sources compared to participants in the control group. On the 5%-significance level, the same interpretation holds true for an inclusion of renewable energy sources into the electricity mix. Overall, we find evidence for an impact of the used environmental priming treatment on our participants' choices, while we find no hint for an effect of the religious priming treatment. According to Benjamin et al. (2010), priming can have differing (or non-linear) effects on behavior, and that this effect especially depends on the strength of the primed identity which may vary across the primed individuals. To examine whether this applies to the priming effect in our experiment, participants are divided into subsets depending on their stated identification with a religious or environmental identity.

Priming: non-linear effects

Table 6 reports the estimation results for a model that includes all attribute values, the status quo alternative and interactions of the priming treatment dummies with the electricity mix attribute values. This model is estimated for four different subsamples, which are selected based on the self-assessed religiousness of the participants on a 5-point scale. For a self-assessed religiousness of three to five, we find a subtle statistically negative religious priming effect, as three corresponding estimated parameters for the interaction terms are different from zero. For green electricity from green providers and green electricity from conventional providers, this holds true at the 10%-significance level, and at the 5%-level for a mix if renewable and fossil energy sources. Furthermore, religious priming seems not to affect participants with a low self-assessed religiousness, i.e. one or two, as the corresponding parameter estimates for the interaction terms are not statistically significant on all common significance levels. This implies that

people without a religious identity are not affected by the treatment. However, if the three-to-five-subsample is further split into participants with medium self-assessed religious identity (three alone) and high to very high self-assessed religious identity (four to five), the estimated coefficients of the interaction terms are not statistically significant anymore, with green electricity from conventional providers for participants with a medium self-assessed religious identity as exception. Taken together, there is only weak evidence for a negative causal effect of religious identity on green behavior.

Tables 7 and 8 report on the same model as described above, now with a focus on environmental instead of religious identity subsamples. In Table 7, subsamples are selected based on the NEP scale, which depends on the participants' agreement with statements towards the environment, and ranges from 6 to 30. The total sample was split into four largely equally-sized subsamples, depending on the NEP score of the participants. For people with a very strong environmental identity, i.e. a NEP score between 28 and 30, there is little evidence for an environmental priming effect. For this group, a positive priming treatment effect is found at the 10%-significance-level only for the choice of a mix of renewable, fossil and nuclear energy sources over a mix of fossil and nuclear energy sources. For respondents with a medium-high environmental identity, i.e. a NEP score between 25 and 27, none of the interaction term parameter estimates is significantly different from zero. However, for participants with a medium-low environmental identity as the next group, i.e. a NEP score between 22 and 24, a significant positive causal effect of the priming treatment is found for choosing green electricity from green providers ($|z|=2.08$), a mix of renewable and fossil energy sources ($|z|=2.17$), and a mix of renewable, fossil and nuclear energy sources ($|z|=3.06$) over a mix of fossil and nuclear energy sources. For the group with a comparably low or no environmental identity, i.e. a NEP score between 6 and 21, the environmental priming only significantly affects the choice of a renewable and fossil energy mix over a mix of fossil and nuclear energy sources ($|z|=2.22$). Overall, these findings back the theoretical arguments in Benjamin et al. (2010): people with a high (environmental) identity already behave in accordance with this identity, i.e. choose the greener alternatives, and an additional priming is thus not capable to additionally shift their behavior towards greener alternatives. When this identity is not permanently as salient as in the highest group, however, the environmental priming induces people to opt for greener alternatives. For people with low or no environmental identity, environmental priming does not evoke a behavioral shift, as the primed identity is not strong enough or not present at all in this group.

The results reported in Table 8 strongly support this claim for the same model. Here, environmental identity is alternatively measured via self-assessed identification with green policies on

a scale from one to five, and subsamples are again built depending on this measure. While environmental priming neither seems to have an effect in the subsamples with a low (one or two) nor with a high (four or five) self-assessed identification with green policies, the estimated parameters for the interaction terms in the subsample with a medium (three) identification are significantly different from zero on all common significance levels for green electricity for green providers (|z|=2.84), a mix of renewable and fossil energy sources (|z|=3.52), and a mix of renewable, fossil and nuclear energy sources (|z|=3.38). For green electricity from conventional providers, the effect is significant on the 10%-level (|z|=1.65). As all the estimated parameters for the interaction terms with the priming treatment are positive, this provides strong evidence for a positive causal effect of environmental identity on green behavior. Participants with strong environmental values on average already choose the greenest alternatives, and priming thus cannot induce them to choose greener alternatives. When an environmental identity exists, but is not (as) salient prior to the priming treatment, i.e. for people with a medium identification with green policy, priming induces them to shift their behavior to the norms and values they associate with their environmental identity, and they choose "greener" alternatives. Again, participants with a low or no identity are not affected by the treatment.

Looking at the control group in Table 4 in more detail supports the findings for both environmental identity measurements: there is a strong correlation between increasing environmental identity and green preferences. The higher the stated identification with green policies, the greener the participants' choices (or preferences)[18].

5. Discussion and conclusions

Based on data from a large-scale computer-based survey among more than 3700 German citizens, this paper empirically examines the causal effect of religious and environmental values, norms, and identity on preferences for green electricity, which are captured by an SC experiment. Our econometric analysis with mixed logit models reports significant correlations of environmental values and green preferences and especially a non-linear causal effect of environmental priming on green preferences, which is driven by respondents with medium environmental values. However, it also reports consistently insignificant correlations of religious values, and an insignificant effect of religious priming.

[18] Further estimation results for the strength of environmental identity in the control group are available on request.

The significant effect of the environmental prime is in line with previous literature on effects of environmental values on green behavior (e.g. Videras et al., 2012, Kotchen and Moore, 2007, 2008, Delmas and Lessem, 2014, Attari et al., 2009, Dastrup et al., 2012, Fischbacher et al., 2015, Schwirplies and Ziegler, 2016, Ziegler, 2017a). However, the results of the present study reach beyond the significance of correlations and show that the environmental values causally affect the choice to select a green electricity mix. In addition, the analysis reveals that the priming effects differ across respondents.

Ths ambiguous result for religious values is in contrast to Benjamin et al. (2016), who report significantly positive effects of religious priming on contributions to public goods among Protestants, but significantly negative effects on contributions to public goods and on risk aversion for Catholics. In fact, different priming effects for different population groups are widely reported in previous studies. In their psychological study, Wheeler and Berger (2007) argue that these differences are due to different prime associations among different groups. On the basis of data for participants in an Internet survey, they report different associations between males and females in the case of the same shopping primes and thus different effects on (stated) purpose- or possibility –driven activities. Wheeler and Berger (2007) additionally reveal different effects of extroverts and introverts on more or less arousing activities after the same primes for going to a party.

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Tables

Table 1: Exemplary choice set in the SC experiment

Please indicate the contract that you would most likely make among the following three contracts:			
	Contract 1	Contract 2	Contract 3
Location of the electricity provider	Within the own region	Outside the own region	Within the own region
Electricity mix in the chosen contract	100% renewable energy (electricity provider sells both electricity from renewable energy sources and electricity produced from nuclear energy or fossil energy sources)	100% renewable energies (electricity provider only sells electricity from renewable energy sources)	Mix of renewable energies, fossil energy sources and nuclear energy
Guaranteed share of electricity in the mix of the chosen contract that is produced within the own region	100%	0%	50%
Annual electricity costs	792 € / year	504 € / year	648 € / year
Type of the electricity provider	Supra-regional German electricity provider	Foreign electricity supplier	Municipal or regional utility
	□	□	□
Would you rather choose none of the previous electricity contracts and instead remain your current electricity contract? □ Yes □ No			

Table 2: Most important attributes and attribute levels in the SC experiment

Attributes	**Attribute levels**	**Status quo (share of respondents**
Electricity mix of the chosen electricity contract	100% renewable energies from a green provider (i.e. only selling electricity from renewable energy sources)	17.41%
	100% renewable energies from a conventional provider (i.e. selling both electricity from renewable energy sources and electricity produced from nuclear energy or fossil energy sources)	11.71%
	Mix of renewable energies and fossil energy sources	3.87%
	Mix of renewable energies, fossil energy sources, and nuclear energy	66.98%
	Mix of fossil energy sources and nuclear energy	0.03%
Annual electricity cost	-30%; -20%; -10%, 0%; 10%; 20%, 30% (compared to last year's electricity cost)	Mean cost: 797.90 €

Table 3: Descriptive statistics

Variable	Control group		Religious treatment group		Environmental treatment group	
	Mean	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
Catholic	0.30	0.46	0.30	0.46	0.27	0.45
Protestant	0.30	0.46	0.31	0.46	0.37	0.48
Muslim	0.01	0.09	0.01	0.11	0.01	0.08
Other religious groups	0.03	0.18	0.03	0.17	0.02	0.15
Unaffiliated	0.36	0.48	0.35	0.48	0.33	0.47
High religiosity	0.13	0.34	0.14	0.35	0.14	0.35
NEP	4.60	1.52	4.62	1.51	4.59	1.42
Ecological orientation	0.49	0.50	0.49	0.50	0.48	0.50
Age	48.46	15.26	48.75	15.04	49.21	15.06
Female	0.51	0.50	0.50	0.50	0.51	0.50
Annual electricity cost (€)	801.55	424.85	794.16	392.07	804.41	410.75
Annual electricity consumption	2864.98	1660.18	2785.15	1431.53	2876.95	1631.66
Housing space	97.06	58.14	98.81	127.77	94.18	44.57
Household size	2.22	1.13	2.19	1.09	2.20	1.09
High education	0.29	0.45	0.27	0.45	0.28	0.45
East Germany	0.20	0.40	0.21	0.41	0.20	0.40
High household income	0.35	0.48	0.30	0.46	0.34	0.47
Observations	1147		1181		579	

Table 4: Estimation results (control group) with interaction terms for env. and rel. identity

Explanatory variables	Parameter estimates (robust z-statistics)					
	Basic estimation		Interaction terms for env. and rel. identity		Interaction terms for socio-economic variables	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Annual electricity costs	1.90*** (40.07)	0.99*** (19.50)	1,90*** (40,60)	0,97*** (19,95)	1,91*** (41,00)	0,95*** (19,80)
100% renewable energies from a green provider	2.26*** (17.66)	1.12*** (10.19)	1,10*** (5,26)	1,02*** (9,73)	1,19*** (2,87)	0,99*** (9,42)
100% renewable energies from a conventional provider	1.43*** (12.20)	0.78*** (5.03)	0,81*** (3,94)	0,77*** (5,46)	1,50*** (3,66)	0,73*** (5,05)
Mix of renewable energies and fossil energy sources	1.19*** (10.51)	0.82*** (5.60)	0,58*** (2,85)	0,78*** (5,22)	0,35 (0,88)	0,71*** (4,32)
Mix of renewable energies, fossil, and nuclear energy	0.50*** (4.85)	0.35 (1.063)	0,31* (1,78)	-0,40 (1,50)	0,01 (0,05)	-0,20 (0,50)
Strongly rel. × 100% renewable energies from a green provider	--	--	0,12 (0,39)	--	0,14 (0,46)	--
Strongly rel. × 100% renewable energies from a conventional provider	--	--	-0,10 (0,50)	--	-0,00 (0,30)	--
Strongly rel. × Mix of renewable energies and fossil energy sources	--	--	0,01 (0,04)	--	-0,00 (0,10)	--
Strongly rel. × Mix of renewable energies, fossil, and nuclear energy	--	--	-0,20 (0,70)	--	-0,20 (0,90)	--
NEP × 100% renewable energies from a green provider	--	--	0,66*** (2,76)	--	0,66*** (2,72)	--
NEP × 100% renewable energies from a conventional provider	--	--	0,04 (0,18)	--	0,07 (0,32)	--
NEP × Mix of renewable energies and fossil energy sources	--	--	0,35 (1,55)	--	0,25 (1,10)	--
NEP × Mix of renewable energies, fossil, and nuclear energy	--	--	-0,00 (0,20)	--	-0,00 (0,40)	--
Strongly ecol. oriented × 100% renewable energies green provider	--	--	1,50*** (6,26)	--	1,44*** (5,86)	--
Strongly ecol. oriented × 100% renewable energies from a conventional provider	--	--	1,28*** (5,58)	--	1,33*** (5,70)	--
Strongly ecol. oriented × Mix of renewable energies and fossil energy sources	--	--	0,86*** (3,84)	--	0,79*** (3,48)	--
Strongly ecol. oriented × Mix of renewable energies, fossil, and nuclear energy	--	--	0,56*** (2,65)	--	0,54** (2,55)	--
Status quo (current electricity contract)	2.36*** (20.51)	2.25*** (18.92)	2,34*** (20,40)	2,24*** (19,94)	2,33*** (20,33)	2,22*** (20,10)
Interactions socio-eco. var. and electricity mixes	No	No	No	No	Yes	No
Other attributes	Yes	Yes	Yes	Yes	Yes	Yes
Number of respondents (number of observations)	1147 (6882)		1147 (6882)		1147 (6882)	

Table 5: Estimation results including interaction terms for religious and environmental priming (for the full sample)

Explanatory variables	Parameter estimates (robust z-statistics)					
	Attribute levels		Interactions with religious priming		Interactions with environmental priming	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Annual electricity costs	1.87*** (60.52)	1.01*** (29.80)	-0.22 (-1.36)	--	0.40* (1.94)	--
100% renewable energies from a green provider	2.28*** (18.93)	1.02*** (14.15)	-0.15 (-0.92)	--	0.29 (1.47)	--
100% renewable energies from a conventional provider	1.43*** (12.62)	0.75*** (8.02)	-0.17 (-1.15)	--	0.52*** (2.62)	--
Mix of renewable energies and fossil energy sources	1.18*** (10.76)	0.79*** (8.66)	-0.11 (-0.76)	--	0.46** (2.48)	--
Mix of renewable energies, fossil, and nuclear energy	0.50*** (4.92)	-0.35** (-2.13)	-0.22 (-1.36)	--	0.40* (1.94)	--
Status quo (current electricity contract)	2.36*** (32.02)	2.40*** (32.67)	--	--	--	--
Other attributes	Yes	Yes	--	--	--	--
Number of respondents (number of observations)	2907 (17442)					

Table 6: Estimation results for religious identity sub-groups

Explanatory variables	Parameter estimates (robust z-statistics)							
	Resp. with strong religious identity (religiousness = 3-5)		Resp. without strong religious identity (religiousness = 1, 2		Resp. with medium level of religious identity (religiousness = 3)		Resp. with high level of religious identity (religiousness = 4-5	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Annual electricity costs	1.73*** (34.63)	1.05*** (19.66)	1,97*** (50,60)	0,99*** (22,90)	1.75*** (28.62)	1.04*** (16.56)	1.71*** (18.64)	1.02*** (9.76)
100% renewable energies from a green provider	2.48*** (13.19)	-1.06*** (-10.05)	2,12*** (13,30)	0,95*** (9,61)	2.46*** (10.70)	1.06*** (7.51)	2.49*** (7.98)	1.13*** (5.1")
100% renewable energies from a conventional provider	1.55*** (8.73)	-0.64*** (-4.40)	1,36*** (9,18)	0,76*** (6,21)	1.61*** (7.22)	0.55*** (2.69)	1.38*** (4.91)	-0.87*** (-3.74)
Mix of renewable energies and fossil energy sources	1.40*** (8.08)	0.78*** (6.01)	1,05*** (7,31)	0,78*** (5,73)	1.48*** (6.92)	-0.62*** (-3.09)	1.15*** (3.94)	-1.08*** (-5.78)
Mix of renewable energies, fossil, and nuclear energy	0.56*** (3.48)	-0.36* (-1.65)	0,45*** (3,49)	0,29 (1,41)	0.62*** (3.13)	0.40 (1.28)	0.29 (1.10)	0.20 (0.19)
Rel. priming × 100% renewable energies from a green provider	-0.47* (-1.91)	--	-0,00 (0,00)	--	-0.49 (-1.60)	--	-0.40 (-1.00)	--
Rel. priming × 100% renewable energies from a conventional provider	-0.40* (-1.72)	--	0,06 (0,34)	--	-0.51* (1.73)	--	-0.14 (-0.38)	--
Rel. priming × Mix of renewable energies and fossil energy sources	-0.46** (-1.97)	--	0,01 (0,09)	--	-0.45 (-1.55)	--	-0.40 (-1.00)	--
Rel. priming × Mix of renewable energies, fossil, and nuclear energy	-0.19 (-0.84)	--	-0,00 (0,20)	--	-0.14 (0.52)	--	-0.18 (-0.52)	--
Status quo (current contract)	2.35*** (19.93)	2.52*** (22.32)	2,36*** (23,60)	2,30*** (23,40)	2.31*** (16.74)	2.58*** (18.80)	2.48*** (11.77=	2.40*** (12.25)
Other attributes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Env. priming x electricity mix levels	Yes	No	Yes	No	Yes	No	Yes	No
Number of respondents (number of observations)	1261 (7566)		1646 (9876)		862 (5172)		399 (2394)	

Table 7: Estimation results for environmental identity sub-groups

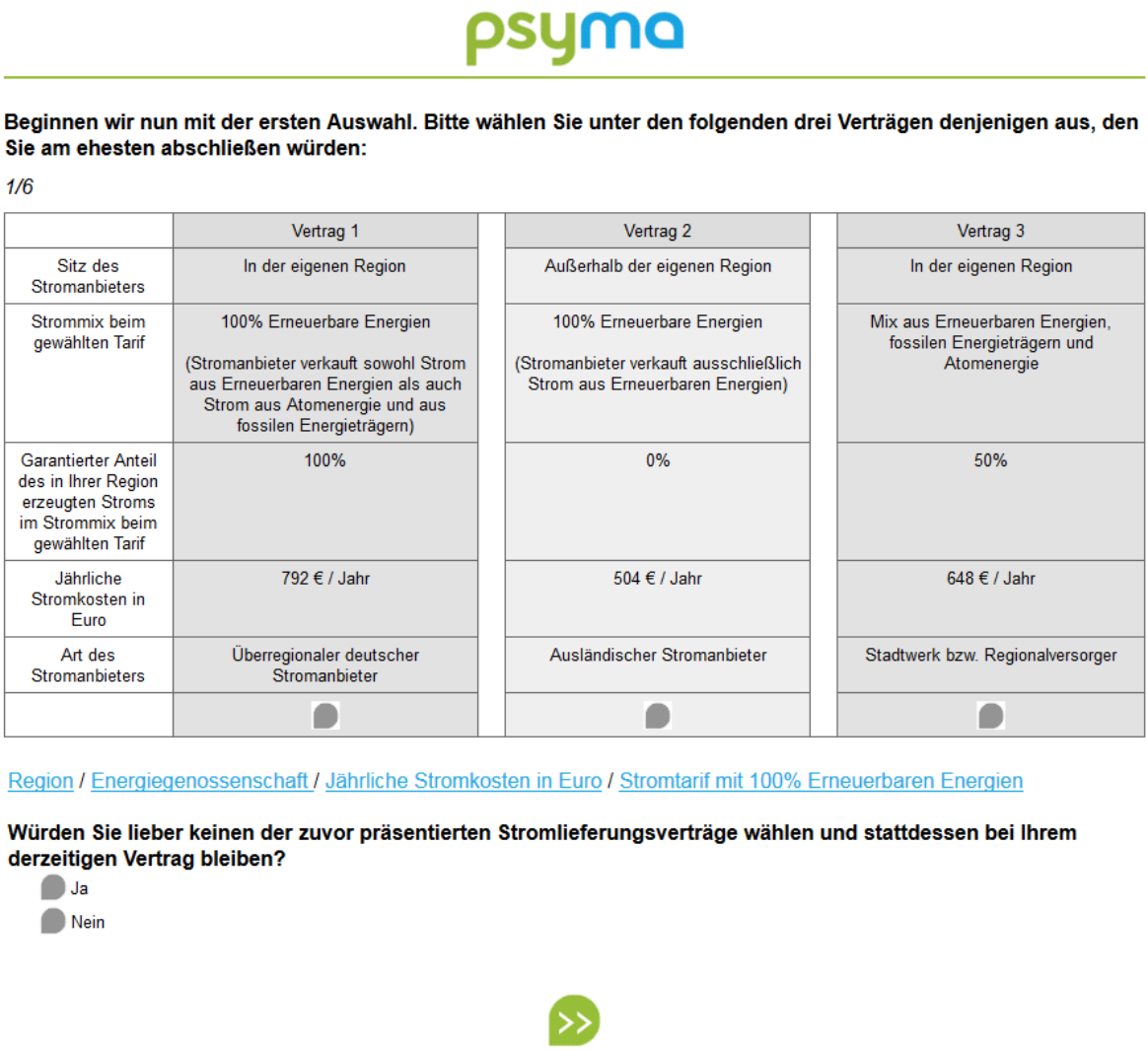
Explanatory variables	Parameter estimates (robust z-statistics)							
	Resp. with a high level of env. awareness (NEP = 28-30)		Resp. with a medium high level of env. awareness (NEP = 25-27)		Resp. with a medium low level of env. awareness (NEP = 22-24)		Resp. with a low level of env. awareness (NEP = 6-21)	
	Mean	**Std. dev.**	**Mean**	**Std. dev.**	**Mean**	**Std. dev.**	**Mean**	**Std. dev.**
Annual electricity costs	1,79*** (24,20)	0,92*** (13,30)	1,84*** (34,00)	0,94*** (16,40)	1,83*** (33,30)	0,90*** (15,00)	2,03*** (28,37)	1,23*** (13,40)
100% renewable energies from a green provider	2,47*** (9,27)	1,20*** (6,80)	2,95*** (12,40)	1,14*** (8,10)	2,10*** (10,10)	0,72*** (5,17)	1,49*** (5,64)	0,74*** (3,44)
100% renewable energies from a conventional provider	1,30*** (5,27)	0,88*** (3,56)	1,90*** (8,67)	0,85*** (5,60)	1,32*** (6,16)	0,50** (2,10)	1,16*** (4,94)	0,65*** (3,25)
Mix of renewable energies and fossil energy sources	0,95*** (4,19)	0,91*** (3,40)	1,87*** (8,81)	0,79*** (4,65)	1,06*** (5,43)	0,70*** (4,40)	0,71*** (2,86)	0,62*** (3,21)
Mix of renewable energies, fossil, and nuclear energy	0,20 (0,98)	0,48 (1,61)	0,94*** (4,73)	0,50** (2,10)	0,37** (2,00)	0,00 (0,01)	0,35* (1,67)	0,12 (0,51)
Env. priming × 100% renewable energies from a green provider	0,59 (1,08)		-0,00 (0,10)		0,71** (2,08)		0,50 (1,25)	
Env. priming × 100% renewable energies from a conventional provider	0,66 (1,28)		-0,30 (0,90)		0,51 (1,41)		0,57 (1,53)	
Env. priming × Mix of renewable energies and fossil energy sources	0,47 (0,93)		0,03 (0,08)		0,77** (2,17)		0,86** (2,22)	
Env. priming × Mix of renewable energies, fossil, and nuclear energy	0,83* (1,76)		-0,00 (0,10)		0,99*** (3,06)		0,26 (0,78)	
Status quo (current contract)	2,25*** (14,20)	2,34*** (14,00)	2,41*** (17,10)	2,44*** (17,10)	2,27*** (17,00)	2,38*** (18,40)	2,59*** (14,49)	2,44*** (13,49)
Other attributes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Religious priming x electricity mix levels	Yes	No	Yes	No	Yes	No	Yes	No
Number of respondents (number of observations)	565 (3390)		864 (5184)		838 (5028)		655 (3930)	

Table 8: Estimation results for political ecologically orientation sub-groups

Explanatory variables	Parameter estimates (robust z-statistics)							
	Resp. with strong ecol. orientation / high level of ecol. orientation (ecological = 4, 5)		Resp. without strong ecol. orientation (ecological = 1-3)		Resp. with a medium level of ecol. orientation (ecological = 3)		Resp. with a low level of ecol. orientation (ecological = 1, 2)	
	Mean	**Std. dev.**	**Mean**	**Std. dev.**	**Mean**	**Std. dev.**	**Mean**	**Std. dev.**
Annual electricity costs	1.74*** (40.95)	0.90*** (19.23)	2.01*** (45.79)	1.98*** (22.01)	1.94*** (24.25)	1.03*** (18.03)	2.17*** (31.95)	1.13*** (12.39)
100% renewable energies from a green provider	2.96*** (16.37)	1.13*** (12.33)	1.69*** (10.12)	0.66*** (5.07)	1.75*** (8.70)	0.59*** (3.66)	1.37*** (5.25)	0.75*** (4.19)
100% renewable energies from a conventional provider	2.01*** (12.18)	0.73*** (6.29)	0.87*** (5.53)	0.66*** (4.40)	0.99*** (4.90)	0.64** (3.36)	0.69*** (2.74)	0.60* (1.83)
Mix of renewable energies and fossil energy sources	1.60*** (9.79)	0.83*** (6.27)	0.81*** (5.45)	0.71*** (4.96)	0.79*** (4.17)	0.73*** (4.39)	0.89*** (3.61)	0.61* (1.85)
Mix of renewable energies, fossil, and nuclear energy	0.83*** (5.27)	0.31 (1.53)	0.20 (1.49)	0.29 (1.13)	0.22 (1.25)	0.58*** (2.67)	0.15 (0.68)	0.07 (0.27)
Env. priming × 100% renewable energies from a green provider	0.15 (0.50)	--	0.70** (2.49)	--	1.05*** (2.84)	--	0.18 (0.39)	--
Env. priming × 100% renewable energies from a conventional provider	0.01 (0.05)	--	0.58** (2.08)	--	0.61* (2.84)	--	0.69 (1.56)	--
Env. priming × Mix of renewable energies and fossil energy sources	0.15 (0.54)	--	0.89*** (3.24)	--	1.29*** (3.52)	--	0.36 (0.80)	--
Env. priming × Mix of renewable energies, fossil, and nuclear energy	0.16 (0.59)	--	0.79*** (3.18)	--	1.08*** (3.38)	--	0.36 (0.86)	--
Status quo (current contract)	2.07*** (22.16)	2.14*** (22.98)	2.64*** (22.23)	2.66*** (23.53)	2.65*** (17.44)	2.74*** (17.93)	2.73*** (13.75)	2.59*** (13.23)
Other attributes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Religious priming x electricity mix levels	Yes	No	Yes	No	Yes	No	Yes	No
Number of respondents (number of observations)	1420 (8520)		1487 (8922)		907 (5442)		580 (3480)	

Figures

Figure 1: Original screenshot of an exemplary choice set in the SC experiment



psyma

Beginnen wir nun mit der ersten Auswahl. Bitte wählen Sie unter den folgenden drei Verträgen denjenigen aus, den Sie am ehesten abschließen würden:

1/6

	Vertrag 1	Vertrag 2	Vertrag 3
Sitz des Stromanbieters	In der eigenen Region	Außerhalb der eigenen Region	In der eigenen Region
Strommix beim gewählten Tarif	100% Erneuerbare Energien (Stromanbieter verkauft sowohl Strom aus Erneuerbaren Energien als auch Strom aus Atomenergie und aus fossilen Energieträgern)	100% Erneuerbare Energien (Stromanbieter verkauft ausschließlich Strom aus Erneuerbaren Energien)	Mix aus Erneuerbaren Energien, fossilen Energieträgern und Atomenergie
Garantierter Anteil des in Ihrer Region erzeugten Stroms im Strommix beim gewählten Tarif	100%	0%	50%
Jährliche Stromkosten in Euro	792 € / Jahr	504 € / Jahr	648 € / Jahr
Art des Stromanbieters	Überregionaler deutscher Stromanbieter	Ausländischer Stromanbieter	Stadtwerk bzw. Regionalversorger
	○	○	○

Region / Energiegenossenschaft / Jährliche Stromkosten in Euro / Stromtarif mit 100% Erneuerbaren Energien

Würden Sie lieber keinen der zuvor präsentierten Stromlieferungsverträge wählen und stattdessen bei Ihrem derzeitigen Vertrag bleiben?

○ Ja
○ Nein