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Utilizing the warm glow of giving to nudge the consumption of food items with ethical claims

– an experimental online auction

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Abstract

Influences on the daily decision-making process of consumers are vast; encompassing internal and external factors. When the decision involves products with ethical claims an extra layer of reasoning emerges as a public good characteristic is added to the private good. Especially in the food sector an increasing number of this type of products exists. One approach to increase the purchase of those products is to nudge impulsive ethical consumption. Our study combines this approach with the concept of the “warm glow of giving”, which originates from public goods theory. The “warm glow” reflects personal gain from an act of altruism. To which extend the “warm glow” can be utilized to influence the willingness-to-pay for food items with ethical claims is the core question of this research. More detailed, our study explores prosocial and pro-environmental claims separately. The paper presents preliminary findings from a binding online experimental auction with 1000 participants in Germany randomly assigned to different treatments with varying messages. Subjects bid on chocolate with FairTrade and Rainforest Alliance claims after having received either a message appealing to their feeling of a warm glow or a message with informative content. Results are embedded in existing theory on decision-making processes.

1. Introduction

When consumers are confronted with multiple purchasing options in a supermarket, we know that their decisions about what enters the shopping cart or not, are usually made fast, partly impulsively and are based on routine (Hoyer, 1984). We also know that many external and internal factors play a role at that very point in time. Special offers, the placement of the product and how the aisles are arranged might matter (Inman, Winer, & Ferraro, 2009) but also our mood or if we are hungry (Nederkoorn, Guerrieri, Havermans, Roefs, & Jansen, 2009). We might also change our mind. We go shopping planning to buy X because it is in line with what we believe in but end up buying Y, because it is cheaper or X was unavailable. This phenomenon is well-documented under the name intention-behavior gap (Aschemann-Witzel & Niebuhr Aagaard, 2014; Auger & Devinney, 2007; Johnston, 2008), especially when looking at food items with ethical claims, such as organic (Carrington et al., 2010; Frostling-Henningsson, Hedbom, & Wilandh, 2014; Papaoikonomou, Ryan, & Ginieis, 2011; Schäufole & Hamm, 2018) or animal welfare (Vigors, 2018). Thereby, the attribute “ethical” spans many aspects, including organic, fair-trade, animal welfare and others. It refers to product characteristics that are right and good for other beings and the environment. Explanations for the gap are plentiful; starting from socially desirable answering behavior in questionnaires, perceived and unperceived behavioral control issues, the lack of trust in the respective claim (Tung, Shih, Wei, & Chen, 2012) and the believe that one’s own food choice does not lead to substantial change (Vermeir & Verbeke, 2008).

Especially self-control issues have been the focal point of many studies analyzing behavior at large (Thaler & Shefrin, 1981) and consumption behavior specifically (e.g. Fennis, Adriaanse, Stroebe, & Pol, 2011). In both cases often cumulating into suggestions such as commitment devices or implementation intentions in order to follow through with one’s good intentions. A different path takes Lades (2014) by investigating theoretically the option of nudging the purchase of ethical goods through impulsiveness. By that he embeds his thoughts in the notion that our decision-making process is guided by two systems: one led by willpower, the other by desire. Our study explores his notion empirically and includes the concept of the warm glow

of giving, which is borrowed from public good theory, as a potential trigger for the impulsive purchase of food items with ethical claims.

The warm glow of giving is the personal benefit that people experience when doing good (Andreoni, 1990). When donating blood or money it has been shown to be an important driving force (Ferguson, Taylor, Keatley, Flynn, & Lawrence, 2012). Regarding sustainable consumption behavior, there is also first evidence that the warm glow matters when people pick their electricity provider (Hartmann, Eisend, Apaolaza, & D'Souza, 2017). Empirical research into the warm glow and food choices has been limited (Bennett & Blaney, 2003) even though a thorough theoretical discussion by Kotchen (2005, 2006) exists. Building on his work, we categorize food items with ethical claims as impure public goods. It is the public good characteristic of the otherwise ordinary private good that supposedly activates the positive feeling of the warm glow when people buy it, e.g. the generated benefit for small-scale farmers when buying coffee beans that were fairly-traded. At this, we intend to connect the motive of the warm glow of giving with the idea of employing impulsiveness in decision-making for a good cause.

Does the warm glow matter when consumers purchase food products with ethical claims, and more precisely can the warm glow be used as a nudge to increase the willingness to buy food products with an ethical claim? It needs to be stressed, arguing within the scope of libertarian paternalism, that it is important that people that are being nudged would truly welcome the outcome. Nudges are supposed to work as actual nudges and not as a manipulation into a direction the receiver of the nudge has not envisaged (Thaler & Sunstein, 2003). That said, in our study, using the warm glow of giving as a nudge should only work for consumers that in reality intend to purchase food items with ethical claims, and possibly have an inherent high level of the feeling of the warm glow of giving.

To support our theoretical argument, we tested it empirically via an experimental online auction with 1,000 German consumers. Before bidding on food products with prosocial and pro-environmental claims, participants got to see different marketing messages – some appealing to the good feeling of the warm glow others being more informative (Karlan & Wood, 2017). Additionally, attitudes, the level of warm glow and altruism, socio-demographics etc. of the participants were captured in a subsequent questionnaire. Our preliminary results are based on a descriptive analysis of the data, as well as a Tobit – regression, in an attempt to explain the factors influencing the willingness to pay (WTP) for each product. At this point, and taking the entire sample into account, the data indicates a larger effect of the warm glow message (nudge) for pro-environmental claims, although the effectiveness message also affects the WTP positively. The messages have more of an impact when 0-bid consumers are taking into account; implying that these messages increase the WTP but not necessarily the level of the WTP. Another rather puzzling finding is the negative effect of the level of altruism on the WTP across all products and claims. Perhaps this is an indication that the purchase of food products with ethical claims is regarded less associated with altruism than anticipated.

2. Conceptual framework

Following well-established decision-making theory, our area of interest is firmly located in System 1 of the two-process theories of reasoning. Whereas System 2 is described to be relatively slow, conscious, analytic, rule-based and decontextualized, System 1 is described to be quick, automated, intuitive, associative and highly contextualized (Stanovich & West,

2000). All of which describe the decision-making process when grocery shopping well. When shopping more than 2/3 of purchases involve at the point of sale decision-making (Inman et al., 2009). According to their study, the baseline probability of unplanned purchases is at .46, which can increase to .93 depending on contextual factors (Inman et al., 2009) - implying that there is a high likelihood of impulsive purchase decisions, and therefore, potential for nudging consumers to choose the ethical alternative impulsively as Lades (2014) suggests.

In his seminal work, Lades discusses the decision-making process along the lines of System 1 and System 2 by adding explanations - for example findings from biopsychology – of why System 1 can lead to decisions that are myopic and not in line with our overall goals; or in other words, lead to the dissonance between liking and wanting. In some situations, System 1 can lead to immediate outcomes that we want, but eventual rewards that we dislike. In System 2 wanting and liking are “almost always” (ibid:p.118) congruent. Lades argues that the factors leading to the wanting mechanism in System 1 (deprived needs that induce a mesolimbic activation that can be satisfied by immediate consumption) can be utilized in order to create the wanting mechanism to consume ethically impulsively, via the self-image of an ethical consumer (in that case the deprived need is psychological). This notion is of interest for our work, as it explores the option of nudging impulsive ethical consumption behavior. Again, it needs to be stressed that the outcome of the impulsive consumption is in the best interest of the individual as judged by herself; otherwise it is a violation of libertarian paternalism. Instead of employing the self-image of the ethical consumer, we use the concept of the warm glow as a potential nudge to consume impulsively (for good).

The warm glow of giving is defined as a personal benefit people receive when doing good (Andreoni, 1990). Instead of only caring for the increase in utility you created through a monetary donation for someone else, you also increase your own utility. You would not increase your own utility, if someone else donated that money. Originating from public good theory, there is theoretical and empirical evidence that the warm glow is a driving force for monetary and blood donations (Ferguson et al., 2012). Additionally, there is evidence that the warm glow plays a role in pro-environmental behavior (Hartmann et al., 2017) and choosing food items with ethical claims in a hypothetical setting (Iweala, Spiller, & Meyerding, 2018). Considering that the warm glow of giving results in an increase in utility that occurs immediately as evidence from neuroscience shows (Harbaugh, Mayr, & Burghart, 2007), it has potential to sway decision-making in System 1 without being in conflict with the respective long-term goal. The immediate gratification is given based on the utility received through the warm glow; the long-term reward is to have chosen a food item that has benefits for the environment and/or society.

A requirement for this mechanism to work is (a) an individual that commonly experiences the warm glow when doing something about social justice and the environment (as those are reflective of the claims we used in the experimental auction) and (b) some kind of nudge when the individual is at the point of sale.

Our study set-up assesses (a) based on statement batteries that follow the experimental auction; and (b) was designed in the form of differing marketing messages. By that, our research design builds on the design by Karlan and Wood (2017) by showing and testing different messages to participants. Specifically, they differentiate, “...*warm glow donors who respond negatively to analytical effectiveness information, and altruism donors who respond positively to such information.*” (ibid:1). Our messages are distinguished between warm glow messages (appealing to the good feeling resulting from purchasing the product) and

effectiveness messages (informing about the good consequences that are achieved through supporting a certain claim). These messages are moreover in line with Singer's juxtaposition of effective vis-à-vis emotional altruists; the latter referring to warm glow givers (Singer, 2015).

3. Study Design

We designed our experiment to compare the effect of different marketing messages on the WTP for food products with ethical claims. The experiment was followed by a questionnaire in order to assess the participants' attitudes, warm glow level etc. In order to reveal the true WTP and at the same time have a large set of participants, we conducted a binding Becker-DeGroot-Marshak (BDM) auction online, with a sample size (before data cleaning) of 1000 participants in Germany.

3.1. Products and Claims

In the auction we presented two types of food products: a bar of chocolate and a box of tea. Each product was featured in two varieties - either labeled with a FairTrade or Rainforest Alliance claim. The FairTrade label as certified by FLOCert stands for a prosocial claim by adding value to the producers of coffee, cocoa, tea and a like. Via minimum pricing and premiums to implement community projects, the FairTrade standard intends to improve the livelihood of farmers in the global South. The label is well known amongst consumers in Western Europe, with levels of awareness above 90% in the U.K. and Germany (Iweala et al. 2018). Aware consumers also have a correct understanding of its purpose (Grunert, Hieke, & Wills, 2014). Additionally, Germany is the second biggest market for FairTrade products (Lernoud J., Potts J. et al., 2015). The Rainforest-Alliance claim is mostly a pro-environmental claim (even though social aspects also play a role) focusing on the environmental sustainability of agricultural activities by setting standards and providing technical assistance to farmers. The two top Rainforest Alliance-certified commodities are cocoa and tea, measured in cultivated area (Lernoud J., Potts J. et al., 2015). Although also well-known amongst consumers, the aim of the label is not well-understood as the majority of consumers appear to believe it is about protecting wildlife in the rainforest (Grunert et al., 2014). This misconception does not hamper our intent because we chose the label as being representative of a pro-environmental claim. Even the misperceived understanding still falls within this category.

For the purpose of our study, it is important to include two well-known labels that represent ethical claims which can be regarded as purely public good characteristics. For example, the organic claim has an alleged health benefit for some consumers (Gassler, Meyer-Höfer, & Spiller, 2016; Hansen, Sørensen, & Eriksen, 2018; Hughner, McDonagh, Prothero, Shultz, & Stanton, 2007) – a hedonic benefit for the consumers on top of the product itself. In that case, the line between pure public good and private good characteristic are blurred and any effect of the warm glow cannot be easily identified. Moreover, we intended to include one prosocial and one pro-environmental claim to identify if a difference in respect of the warm glow is given. Tea and chocolate were chosen because both are important commodities for both certifications (Lernoud J., Potts J. et al. 2015); therefore, both products are found in the market with each respective claim (although from different brands). Certainly this worked to our advantage as tea and chocolate are comparatively easy to ship.

3.2. Marketing Messages

In the questionnaire we capture the general level of the warm glow of participants, but in the auction we intended to use the feeling of the warm glow as a nudge – reminding the ones that would be responsive to it because they already have a higher level of the warm glow. How best to trigger the feeling of the warm glow via short marketing messages and juxtapose it at the same time with messages that are markedly different in the wording and rather effective in nature? The concept of accessibility of thought (Kahnemann, 2003) provided advice. *“The ‘hot’ states of high emotional and motivational arousal greatly increase the accessibility of thoughts that relate to the immediate emotion and to the current needs, and reduce the accessibility of other thoughts.”* summarizes Kahnemann the work of Loewenstein and Elster (2003:1454). Therefore, and in order to blank out other thoughts and make the feeling of the warm glow easily accessible, the warm glow messages were meant to appeal strongly to the emotions of the participants and directly addressed them (*“Feel good about yourself when eating chocolate”*). The other messages (effectiveness messages) conveyed basically the same information, but with numbers and concise facts outlining the effectiveness of the Rainforest Alliance and FairTrade programs instead of the direct appeal (*“In 2017, FairTrade-producers received about 150 million Euro in FairTrade premiums.”*).

This approach follows the methodology in terms of wording by Karlan and Wood (2017). In their study they appealed to potential donors to a charity by varying the wording in a letter addressed to them: one version of the letter mentioned the impact of the charity, the other was more affective without impact figures. They conveyed the message in comparatively long letters. The recipient received them at home; therefore, having enough time to read them. As grocery shopping is usually characterized by limited time and lots of external factors, our messages had to be brief and easy to understand, so that theoretically they could be employed in real life.

Besides the wording, the design of all messages was the same: placing the label of each certification at its core, a photo that combines the environmental and social aspect of the claim and a sketched symbol/icon of the product – as illustrated in A1 in the appendix. After the messages, the participants got to see the screen with the actual product photo, which was reduced to the product and a single label (see A2 in appendix).

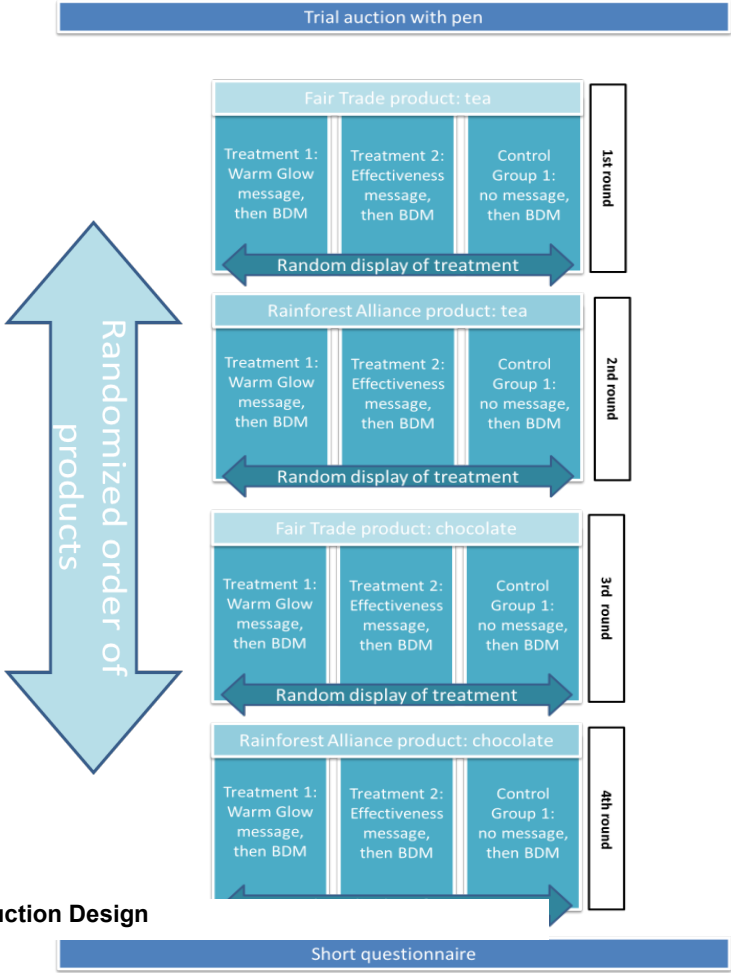
3.3. Auction Mechanism

In a BDM, the participant places her bid. If the bid exceeds a randomly picked price, the participant purchases the product and pays the randomly picked price. If the participant’s bid falls below the randomly picked price, the participant will not purchase the product. Resulting measures of WTP have been shown to be valid and not results of overbidding (Miller, Hofstetter, Krohmer, & Zhang, 2011; Wertenbroch & Skiera, 2002). Implementing the auction online provides additional benefits (Lemken, Knigge, Meyerding, & Spiller, 2017): Respondents are in the privacy of their own home (or at least on their own mobile device) which reduces socially desirable behavior and the possible urge to please the experimenter. Moreover, it is closer to an online shopping experience in real life than an experiment in the lab, even though impulsive purchases might be easier to trigger in the lab as there is no time gap between purchase and delivery of the product.

Participants in the online experiment receive a comparatively small participation fee, as they do not face the costs of coming physically to a lab, which minimizes any endowment effect that

could result from comparatively large show-up and participation fees. An advantage of a lab experiment is the given trust between experimenter and participant due to the same location, face-to-face contact, and immediate transaction. Participants do not need to worry about not receiving the product. In order to reach a similar level of trust in an online setting, we communicated from the onset the association with the University of Goettingen, which is well-known among the German population, and left a contact address at the beginning and end. Furthermore, we have access to a consumer panel that has done binding auctions on the platform we are using.

In our online setting, we use a slightly adapted version of the BDM. The secret bid was not randomly generated for each participant but pre-determined by the experimenter, nonetheless also unknown to the participant (Lusk, Fox, Schroeder, Mintert, & Koohmaraie, 2001). This is communicated to the participants in the instructions to the auction mechanism. Those pre-determined prices are based on a market analysis for both products and represent a mid-range price. In order to make sure that the participants understood the mechanism of the auction, they needed to pass a short quiz to advance to the auction.



After providing information about socio-demographics, subjects were randomly assigned to one of 12 groups given the 4X3 design: four product treatments (Rainforest-Alliance tea or chocolate bar and FairTrade tea or chocolate bar) and three message treatments (no message, warm glow message, and effectiveness message), as illustrated in Figure 1. Overall each participant bids on four different products, but only two rounds were chosen to be binding. It was unknown to the participant which rounds were binding.

Each time, the participant gets one of the three messages that were picked at random. The randomized order of products accounts for the possibility of order effects. After each bid, the participant receives a notification whether his bid was higher than the pre-determined bid, including a reminder that it still needs to be determined if this auction round is binding.

Figure 1. Auction Design

The auction was conducted within two weeks in late November 2018 on the platform veylinx³. Veylinx also provided the panel of participants. Participants could pay via PayPal and credit card. The auctioned-off products were sent out by us in mid-December by mail.

³ <https://www.veylinx.com>

4. Material & Results

Initially, 2005 participants started the survey but about 50% declined to participate in a binding auction. Out of the 1006 completes, we retained 833 observations after the data cleaning process for the following data analysis. Speeders (i.e. participants that spent less than 1/3 of the median time on the survey) and straightliners (i.e. participants that ticked in three or more statement batteries the same respective answer) were removed from the data set.

Overall, we had 256 bids in the auction of the FairTrade – chocolate that were higher than the pre-determined unknown bid of 1,99 € and 166 bids in the auction of the Rainforest Alliance – tea that were higher than the pre-determined unknown bid of 2,49 €. The participants were informed by e-mail about the auction outcome and asked to pay the respective amount online. A reminder to pay was sent three times. Yet, only 41 bars of chocolate (16%) and 14 packs of tea (8 %) were paid for and consequently mailed out by us.

The resulting sample characteristics regarding socio-economic factors is summarized in Table 1 and regarding geographic location in table A3 in the appendix. The panel provider allowed us to set quotas for gender and age only. After data cleaning, the percentages changed slightly, but largely represent the proportions in the German population. In terms of education and income, the corresponding lower levels are underrepresented. Therefore, the following descriptive numbers need to be interpreted with caution. The geographic distribution of participants worked out well without setting quotas; most states come close to the census data. The rural and urban areas are also reasonably well matched; only the small towns are notably underrepresented (missing 9%).

Table 1

Socio - economic characteristics of full sample and treatment groups (in %) compared to census data

	Census Sample		Chocolate (FT)			Chocolate (RA)			Tea (FT)			Tea (RA)		
			C	WG	EF	C	WG	EF	C	WG	EF	C	WG	EF
Gender														
Female	51	48	51	45	47	59	47	49	48	49	48	50	46	50
Male	49	51	49	54	52	19	53	50	52	50	51	49	53	50
Other	n/a	.4	.4	.7	.4	.4	.7	.4	0	.4	1	1	.3	0
Age groups														
18 - 27 years	16	14	14	13	12	12	13	15	14	14	11	11	13	15
28 - 37 years	20	24	24	21	26	24	24	23	26	22	24	23	23	25
38 - 47 years	20	21	19	22	23	22	24	18	20	19	25	19	26	19
48 - 57 years	25	24	27	24	22	26	21	27	25	25	24	27	24	22
58 - 67 years	19	17	15	19	17	16	19	17	14	21	18	19	14	19
Level of education														
No qualification	4	2	2	3	1	1	2	2	2	2	2	2	1	2
Lower secondary education	35	13	13	12	13	16	11	12	12	15	11	13	12	13
Upper secondary education	31	35	34	35	38	33	35	39	36	37	34	33	36	37
Higher education entrance qualification	13	23	25	25	19	21	26	23	27	20	22	28	19	22
University degree	17	26	26	25	27	29	26	24	23	26	29	24	29	25
Other	n/a	.8	0	.7	2	1	.7	.4	.3	0	2	.4	1	.4
Income groups														
Low income (< 1.3000€)	26	17	17	14	19	17	16	17	17	19	14	15	16	18
Middle income (1.300 - 2.599€)	40	37	38	37	36	37	38	36	37	38	36	36	37	39
High-middle income (2.600 - 4.999€)	27	34	33	38	33	33	35	37	33	29	41	39	33	32
high income (> 5.000€)	7	12	11	11	12	13	11	10	13	13	9	9	14	11
N	833		288	277	267	283	275	275	296	258	279	264	285	284

Note. C = Control Group, WG = Warm Glow Treatment, EF = Effectiveness Treatment

Note 2. Source of census data: Federal Statistical Office

4.1. Descriptive results

Willingness-to-pay

An overview of the bids by the participants provides Table 2. It illustrates the mean of all bids for each product. It needs to be noted that a substantial amount of participants was not interested in the products (or at least not to purchase them online), and, therefore, chose to bid 0 €. The share of 0-bids is smaller for the bars of chocolate, with 27.9%, than for the packs of tea with 33%. The difference might be attributed to the difference in consumption. Only 5.4% of participants stated that they never eat chocolate, whereas that number rises to 12% when asking about tea consumption.

As highlighted in Table 2, the WTP for the FairTrade-chocolate in the full sample is highest following the Warm Glow message, but when excluding the 0-bids the WTP is the highest when having seen the effectiveness message. The WTP for the Rainforest Alliance-chocolate is in both cases the highest for the effectiveness message. The same can be observed for the FairTrade - tea and the Rainforest Alliance - tea, although there is a tie between Warm Glow-message and effectiveness-message in the full sample. Except of the WTP for the FairTrade-chocolate when including 0-bids, the Rainforest Alliance - products have a higher WTP.

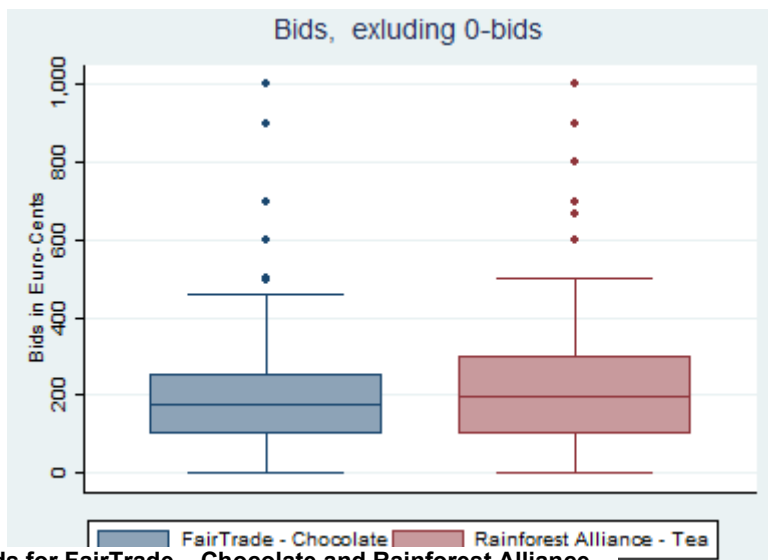
Comparing the percentage of 0-bids per product, a higher rate can be observed in the control group. Again, the FairTrade – chocolate is the exception, having a comparatively low 0-bid percentage in the control group. The Rainforest Alliance – chocolate sees the biggest drop in 0-bids between control and treatment groups.

Table 2
Willingness-to-pay by treatment and product

Incl. zero bids	Control			Warm Glow			Effectiveness		
	Mean	SD	% of zero bids	Mean	SD	% of zero bids	Mean	SD	% of zero bids
FairTrade									
Chocolate bar	1,30	1,36	.26	1,33	1,40	.26	1,25	1,43	.31
Tea	1,24	1,37	.35	1,25	1,28	.34	1,32	1,32	.31
Rainforest Alliance									
Chocolate bar	1,02	1,26	.35	1,29	1,30	.26	1,40	1,46	.23
Tea	1,07	1,20	.31	1,38	1,44	.29	1,38	1,54	.31
Excl. zero bids									
FairTrade									
Chocolate bar	1,77	1,31	n/a	1,81	1,34	n/a	1,84	1,39	n/a
Tea	1,89	1,28	n/a	1,88	1,14	n/a	1,91	1,17	n/a
Rainforest Alliance									
Chocolate bar	1,55	1,27	n/a	1,75	1,21	n/a	1,82	1,41	n/a
Tea	1,73	1,1	n/a	1,96	1,34	n/a	2,00	1,48	n/a

When comparing these results with the product prices in the real market place, the emerging levels of WTP appear rather sound. The Rainforest Alliance – tea and the FairTrade – chocolate are existing products in the market place which makes a more in-depth comparison feasible. Online the tea is available for 1,99 € excluding shipping; in-store the price is usually not higher than 2,49€. The online price is comparable to the mean WTP when excluding the 0-bids. The box plot (Graph 1) shows that 50% of the bids fall between 1€ and 3€.

The presented FairTrade – chocolate is available on- and offline at a fixed price of 1,25€. It is



produced as part of an initiative; therefore, producers and retailers wave their profits. As a result, the chocolate is sold at a comparatively low price. Other comparable products with the Fair-Trade label range from 1,29€ (discounter price) to 1,79€ (supermarket). Our levels of WTP are slightly above that, although participants might have also factored in the shipping costs that they did not need to pay for.

The box plot (Graph 1) illustrates that 50% of the bids fall within the range of 1,00€ and 2,50€.

Graph 2. Bids for FairTrade – Chocolate and Rainforest Alliance-
Tea

Principal Component Analysis (PCA)

The answers in the questionnaire were analyzed with a confirmatory PCA in order to narrow down the statement batteries to the core of each concept; namely the warm glow of giving, altruism, attitude towards charitable organizations, attitude towards environmental and humanitarian organizations, and volunteering behavior. Conducting principal component analyses achieves this reduction in dimensionality of the data set whilst retaining most of the variance (Jolliffe, 2002). As a result new variables are created: principal components. They are uncorrelated and preserve most of the variance (ibid). Those were used in the subsequent inferential statistical analysis as independent variables.

As the concept of the warm glow is at the core of this paper, its - as well as the altruism's – PCA results are presented in more detail. The results of the other concepts are found in the Appendix (A4 – A6).

The PCA reveals a single warm glow component, combining environmental and social aspects. All items load highly (above 0.7) on it. According to Cronbach's alpha the items are internally highly consistent; implying an accurate measure of the warm glow based on the utilized items (items adjusted from Hartmann et al., 2017). The other necessary goodness of fit criteria are all fulfilled (see Table 3).

Table 3

Results of principal component analysis of warm glow statements (N=833)

Cronbach's alpha: .8908	Mean	SD	Factor loading
Doing something against the deforestation of rain forests gives me a pleasant feeling of personal satisfaction.	3.32	1.17	.8159
When I help to preserve biodiversity, I feel happy that I contributed to the functioning of our eco-system.	3.54	1.09	.8333
I am happy with myself whenever I make a contribution towards protecting the environment.	3.66	1.04	.8319
I am pleased with myself, when I contributed to a fair society.	3.58	1.02	.8119
Doing something about social injustice gives me a pleasant feeling of personal satisfaction.	3.65	1.09	.7574
Participating in programs aiming at fair compensation for farmers/workers, makes me feel satisfied, giving something back to society.	3.53	1.02	.7785

Note. Scale from 1 'not true of me at all' to 5 'extremely true of me'.

Note 2. Items translated from German.

Note 3. Kaiser-Meyer-Olkin measure of sampling adequacy: 0.9060

Altruism is conceptualized with two of Schwartz' Human Values, universalism and benevolence, and measured via the corresponding items in the Portrait Values Questionnaire (PVQ-21) as developed by Schwartz et al. (2001). Contrary to the conventional way of analyzing the PVQ and doing a confirmatory PCA for each value, we also run an explorative PCA of all our battery statements at once. This revealed one single component for "benevolence" and "universalism". All of the items in Table 4 load highly (above 0.7) on this component. We therefore used it in our subsequent analysis as such.

Table 4

Results of principal component analysis of Schwartz Human Values "benevolence" & "universalism" (N=833)

Cronbach's alpha: .8330	Mean	SD	Factor loading
S/he thinks it is important that every person in the world should be treated equally. S/he believes everyone should have equal opportunities in life.	3.67	1.11	.8048
It is important to him/her to listen to people who are different from him/her. Even when s/he disagrees with them, s/he still wants to understand them.	3.68	.98	.7735
It's very important to him to help the people around him/her. S/he wants to care for their well-being.	3.63	.95	.7390
It is important to him/her to be loyal to his friends. S/he wants to devote himself to people close to him/her.	3.92	1.02	.7805
S/he strongly believes that people should care for nature. Looking after the environment is important to him/her.	3.80	1.03	.7733

Note. Scale from 1 'not like me at all' to 5 'very much like me'

Note 2. Kaiser-Meyer-Olkin measure of sampling adequacy: 0.8583

4.2. Tobit-Model

Did both message types have an influence on the WTP for each product, especially when considering socio-economic factors and concepts, such as the warm glow level or altruism?

To find out we employed the help of a Tobit regression. For auction data it is advantageous as compared to an OLS regression, because our dependent variable – the WTP for each of the four products – is censored at zero as bids below 0 were not possible. Additionally, the accommodation of censoring for the upper level is possible, which is also necessary in our study as (comparable) products are available in the market. As it is well suited for auction data, it is commonly employed (Drichoutis, Lazaridis, & Nayga, 2009; Lee, Han, Nayga, & Lim, 2011; Lemken et al., 2017).

In our first model specification we included the 0-bids, because when following the framework of nudging impulsive purchases, we are especially interested in those that would not necessarily bid on the products. In the supermarket, those consumers might be the ones being undecided but not necessarily unwilling to purchase. Additionally, we set a lower limit of 0, due to the censoring of negative bids, and an upper limit of 5, reflecting market prices of higher end but equal products. All variables were standardized in order to make the coefficient comparable.

To see whether there are different effects when only looking at the participants that have some level of willingness-to-pay, we run the model again but without 0-bids. All other specifications remained unchanged.

In the following configuration (Table 5 & 6), we first tested solely the treatment effects on the WTP for each product and for each specification, before adding the other independent variables in the full configuration (Table 7 & 8).

Table 5
Tobit regression results for each product, only treatment effects, including 0-bids

Variables	WTP for...							
	Chocolate (FairTrade); N= 833		Chocolate (Rainforest Alliance); N=833		Tea (FairTrade); N=833		Tea (Rainforest Alliance); N=833	
	ME	SE	ME	SE	ME	SE	ME	SE
Treatment: Warm Glow	1.1	7.4	21.0 **	7.4	-.33	7.9	20.4 **	8.2
Treatment: Effectiveness	-6.2	7.4	29.1 ***	7.4	6.7 *	7.9	18.5 **	8.3
	Prob>Chi2= 0.5788		Prob>Chi2= 0.0003		Prob>Chi2= 0.6147		Prob>Chi2= 0.0255	

Note. Significant levels * = 10%, ** = 5%, *** = 1%

Table 6
Tobit regression results for each product, only treatment effects, excluding 0-bids

Variables	WTP for...							
	Chocolate (FairTrade); N= 598		Chocolate (Rainforest Alliance); N=601		Tea (FairTrade); N=564		Tea (Rainforest Alliance); N=566	
	ME	SE	ME	SE	ME	SE	ME	SE
Treatment: Warm Glow	2.0	6.0	11.12 *	6.2	-2.0	5.9	8.6	6.4
Treatment: Effectiveness	1.6	6.1	14.3 **	6.1	.67	5.9	9.9	6.4
	Prob>Chi2= 0.9388		Prob>Chi2= 0.0523		Prob>Chi2= 0.8967		Prob>Chi2= 0.3565	

Note. Significant levels * = 10%, ** = 5%, *** = 1%

When including 0-bids, results show significant effects of each treatment on the WTP for Rainforest Alliance - products, with varying effect size. Among the FairTrade –products, only the tea is affected positively by the effectiveness message. When excluding 0-bids, only the effect on the Rainforest Alliance - chocolate remains significant, albeit smaller in size.

Introducing the other independent variables to the model (Table 7) shows the robustness of the warm glow treatment; it still boosts a positive effect on each Rainforest Alliance - product (albeit a smaller effect size). The WTP for FairTrade - products is still not affected by the

warm glow treatment. The effectiveness treatment has a comparatively large positive effect on the Rainforest Alliance - chocolate and the FairTrade - tea. In contrast to Table 5, the effect on the Rainforest Alliance - tea is no longer significant.

Amongst the five constructs, it is not without surprise that “altruism” has the largest negative effect on all products. The construct “behavior”, that captures whether or not people engage in volunteer work (an apparent act of altruism), has a positive effect on three products. Another positive effect throughout all products has the rate of tea or chocolate consumption. Considering 0-bids are included in the dependent variable, this is a reasonable finding.

In respect of the socio-economic factors, age plays the biggest role by affecting all products negatively. It must be noted that age constitutes age groups here; therefore, the comparatively large negative effect comes in (forward) jumps of ten years. The positive effect of income on the WTP for all products is only statistically significant in the case of the FairTrade claim. Similarly gender (being male) has only a statistically significant negative effect on FairTrade products.

Table 7
Tobit regression results for each product including 0-bids

Variables	WTP for...							
	Chocolate (FairTrade); N= 683		Chocolate (Rainforest Alliance); N=684		Tea (FairTrade); N=684		Tea (Rainforest Alliance); N=684	
	ME	SE	ME	SE	ME	SE	ME	SE
Treatment: Warm Glow	.69	7.4	18.2 **	7.6	-.12	8.0	19.6 **	8.5
Treatment: Effectiveness	-9.5	7.3	24.9 ***	7.6	14.2 *	8.0	13.5	8.5
Gender	-11.4 *	6.9	-7.6	7.1	-15.9 **	7.6	-12.6	7.7
Age	-28.6 ***	6.8	-29.9 ***	7.0	-32.1 ***	7.5	-35.5 ***	7.5
Income	12.5 *	7.1	11.5	7.3	14.6 *	7.7	11.8	7.8
Education	-5.2	7.4	-3.5	7.6	-19.4 **	8.1	-10.7	8.2
Warm Glow (PC)	-.56	8.7	6.0	9.0	6.5	9.6	7.4	9.6
Altruism (PC)	-17.6 *	9.3	-30.4 ***	9.6	-29.4 ***	10.1	-21.4 **	10.2
Charities (PC)	6.3	8.2	3.0	8.4	-7.1	8.9	-14.4	9.1
Attitude (PC)	16.4 **	7.2	10.0	7.4	-3.6	7.8	.96	7.6
Behaviour (PC)	9.6	6.8	13.4 *	6.9	16.9 **	7.5	19.1 **	7.5
Consumption	18.8 ***	6.7	23.3 ***	6.9	23.7 ***	7.2	28.1 ***	7.5

Note. Prob > Chi2 = 0.0000 for all four specifications

Note 2. Significant levels * = 10%, ** = 5%, *** = 1%

Comparing these results with the effects in Table 8 (excluding 0-bids), reveals only one successful treatment effect. The warm glow message still has a positive (albeit smaller) effect on the WTP for Rainforest Alliance - chocolate. The same product is positively affected by the construct “warm glow” (the only time this construct has an effect), as well as negatively by the construct “altruism”. The construct “behavior” reflecting volunteering behavior has a similar positive effect as in the model including 0-bids. The absence of 0-bids explains why the consumption of tea or chocolate plays an insignificant role.

Regarding socio-economic factors, age continues to have the largest (negative) effect. Gender is only significant in the case of FairTrade – tea, just as the level of education. Once 0-bids are excluded, income has no more a significant effect on the WTP.

Table 8
Tobit regression results for each product excluding 0-bids

Variables	WTP for...							
	Chocolate (FairTrade); N= 485		Chocolate (Rainforest Alliance); N=482		Tea (FairTrade); N=455		Tea (Rainforest Alliance); N=454	
	ME	SE	ME	SE	ME	SE	ME	SE
Treatment: Warm Glow	6.4	6.0	11.8 **	6.4	-1.7	6.2	7.3	6.7
Treatment: Effectiveness	-1.5	6.0	10.2	6.4	8.1	6.2	7.7	6.8
Gender	-6.1	5.7	-6.2	5.9	-15.2 **	7.6	-8.3	6.1
Age	-30.3 ***	5.6	-24.7 ***	5.8	-20.3 ***	7.5	-23.8 ***	6.1
Income	-69	5.9	1.2	6.1	1.2	7.7	-.03	6.3
Education	.68	6.0	-.74	6.4	-13.6 *	8.1	-2.6	6.5
Warm Glow (PC)	6.2	7.0	12.2 *	7.4	4.9	9.6	4.1	7.5
Altruism (PC)	-6.4	7.5	-17.0 **	8.0	-6.8	10.1	-3.4	8.0
Charities (PC)	3.7	6.7	.16	6.9	-1.9	8.9	-7.1	7.1
Attitude (PC)	3.5	5.9	-2.0	6.1	-6.7	7.8	1.2	6.2
Behaviour (PC)	7.8	5.6	14.3 **	5.9	14.9 **	7.5	12.7 **	6.3
Consumption	-1.9	5.8	6.2	5.6	4.2	7.2	3.4	6.3

Note. Prob > Chi2 = 0.0001 for three specifications, Prob > Chi2 = 0.0030 for Tea (Rainforest Alliance)

Note 2. Significant levels * = 10%, ** = 5%, *** = 1%

5. Discussion

Can the warm glow and its immediate increase in utility be used to nudge warm glow - affine consumers into purchasing food products with public good characteristics? Based on our current data analysis, an answer can be tentative at best and ambiguous at worst. At best, the positive effect of the warm glow treatment on the WTP for the Rainforest Alliance – products is indicative of the potential to nudge consumers into “being willing to pay” for food products with ethical claims. Considering that the effectiveness message had a similar outcome might simply suggest that in the fast and low-involving shopping environment, any message appealing to a good cause can do the trick.

The difference between the model specification with and without 0-bids must be added to this thought. As a result of our current analysis, we can mainly observe the treatment effect on consumers that were not immediately willing to bid on the product. Excluding 0-bids, and hence, only looking only at the increase of the level of WTP, reduced the effects and rendered all but one insignificant. Yet, in that one case (the warm glow treatment increasing the WTP for the Rainforest Alliance – tea when excluding 0-bids) also the “warm glow” - construct has a statistically significant positive influence on the WTP, whereas the altruism - construct continues to have a statistically significant negative influence on the WTP for the very same product.

Altogether, altruism has a counterintuitive (negative) influence on all products - a rather puzzling observation when considering the number of studies showing a positive influence on the motivation of pro-environmental (Aertsens, Verbeke, Mondelaers, & van Huylenbroeck, 2009) or prosocial (Carrero, Redondo, & Fabra, 2016) consumer behavior. Even though it is acknowledged that motivation and concern based on values often only have a weak link to actual use and implementation, esp. when focusing on food items with ethical claims (Grunert et al., 2014). It might be considered that the purchase of the presented products is not as

strongly linked to altruism as anticipated. Yet, the concept of volunteering behavior (Table A5 in the appendix) has a coherent positive influence on the WTP for three of the four products. Considering that volunteering is an act of altruism, the opposing direction of both concepts is surprising. Perhaps a differentiation needs to be drawn between active and inactive altruism, and only the latter has a positive effect on purchasing choices.

Although, the effect of the concept “warm glow” is only significant once, it mostly has the expected (positive) direction, except for the FairTrade - chocolate when including 0-bids. It must be noted that compared to the altruism items (Table 4), the warm glow items (Table 5) are narrower and have a closer link to the products the participants bid on.

A further analysis of subsamples of our data set, might provide more insights regarding the possibility of using the warm glow to nudge potential consumers into purchasing food products with environmental and societal benefits.

A crucial factor persists: how do we capture the feeling of the warm glow best? When doing so via statement batteries or crowding-out effects (Ottoni-Wilhelm, Vesterlund, & Xie, 2017), doubts remain whether the core of the warm glow is measured. Hard facts, in the form of an activation of the rewarding center in the brain (Harbaugh et al., 2007), might make a more substantial case, and could motivate consumer studies linking up with neuroscience.

Appendix




Marketing Messages in German

English Translation

Genuss mit gutem Gewissen

Gutes tun wird belohnt:
Fühl dich gut beim Schokoladegessen.




Du isst nicht nur ein Stück Schokolade, du unterstützt dabei auch Wälder und die Bodengesundheit in Anbauregionen weltweit bei der Herstellung von Gemeinschaftsprüfungen.

Genuss mit gutem Gewissen

Gutes tun wird belohnt:
Fühl dich gut beim Schokoladegessen.




Du isst nicht nur ein Stück Schokolade, du unterstützt dabei auch Wälder und die Bodengesundheit in Anbauregionen weltweit zu bewahren.

Genuss mit gutem Gewissen

Gutes tun wird belohnt:
Fühl dich gut beim Teetrinken.




Du trinkst nicht nur eine Tasse Tee, du unterstützt dabei auch Wälder und die Bodengesundheit in Anbauregionen weltweit zu bewahren.

Genuss mit gutem Gewissen

Gutes tun wird belohnt:
Fühl dich gut beim Teetrinken.




Du trinkst nicht nur eine Tasse Tee, du unterstützt dabei auch Wälder und die Bodengesundheit in Anbauregionen weltweit zu bewahren.

Indulgence with good conscience

Doing good is being rewarded: Feel good about your chocolate.

You are not just eating chocolate, you support small-scale farmers to improve community projects worldwide.

Indulgence with good conscience

Doing good is being rewarded: Feel good about yourself when drinking a cup of tea.

You are not just drinking tea, you support forests and the health of the soil in growing regions worldwide.








Fair-gedandelte Schokolade hilft

2017 erhielten Fairtrade-Produzenten insgesamt Fairtrade-Prämieengelder in Höhe von 150 Mio. Euro.

Dabei profitieren über 1,66 Mio. Bäuerinnen, Bauern und Arbeitskräfte in 73 Ländern.

Rainforest-Alliance Schokolade hilft

Wälder erhalten, Bodengesundheit bewahren und Gewässer schützen - in diesen nachhaltigen Anbaumethoden wurden über 1 Mio. Kleinbauern geschützt.

3,5 Mio. Hektar Agrarflächen werden durch nachhaltig bewirtschaftet.





Fair-gedandelte Tee hilft

2017 erhielten Fairtrade-Produzenten insgesamt Fairtrade-Prämieengelder in Höhe von 150 Mio. Euro.

Dabei profitieren über 1,66 Mio. Bäuerinnen, Bauern und Arbeitskräfte in 73 Ländern.





Rainforest-Alliance Tee hilft

Wälder erhalten, Bodengesundheit bewahren und Gewässer schützen - in diesen nachhaltigen Anbaumethoden wurden über 1 Mio. Kleinbauern geschützt.

3,5 Mio. Hektar Agrarflächen werden durch nachhaltig bewirtschaftet.








Fairly-traded chocolate helps

In 2017, fairtrade producers received about 150m. Euro in fairtrade-premiums.

Thereby, more than 1.66m. farmers and workers in 73 countries benefit.






Rainforest-Alliance tea helps

Saving forests, preserving soil health, protecting waters - these sustainable cultivation methods are being taught to 1m small-scale farmers worldwide

3.5m hectares of agricultural land is being cultivated sustainably as a result





A2

Examples of auction screen



€ 0,00

Gebot abgeben



€ 1,00

Gebot abgeben

A3

Geographic distribution of sample (in %) compared to census data

	Sample	Census
State		
Baden-Wuerttemberg	13	13
Bavaria	12	16
Berlin	9	4
Brandenburg	4	3
Bremen	2	1
Hamburg	4	2
Hesse	6	8
Mecklenburg-Western Pomerania	2	2
Lower Saxony	5	10
North Rhine-Westphalian	21	22
Rhineland-Palatinate	5	5
Saarland	2	1
Saxony	7	5
Saxony-Anhalt	3	3
Schleswig-Holstein	3	3
Thuringia	2	3
Size of residence (in inhabitants)		
less than 5,000	16	14
5,000 - > 20,000	17	26
20,000 - > 100,000	26	27
100,000 - > 200,000	10	7
200,000 - > 500,000	10	9
500,000 and more	21	17

A4

Results of principal component analysis of attitude towards charitable organizations (ACO) (N=833)

Cronbach's alpha: .8344	Mean	SD	Factor loading
The money given to charities goes for good causes.	3.30	1.06	.7854
My image of charitable organizations is positive.	3.36	.98	.8346
Charitable organizations have been quite successful in helping the needy.	3.39	.98	.8083
Charity organizations perform a useful function for society.	3.61	.98	.8446

Note. Scale from 1 'I don't agree at all' to 5 'I very much agree'.

Note 2. Kaiser-Meyer-Olkin measure of sampling adequacy: 0.8088

A5

Results of principal component analysis of volunteering behavior (N=833)

Cronbach's alpha: .9137	Mean	SD	Factor loading
I do volunteering work.	2.76	1.28	.8938
I volunteered in the past 6 months.	2.74	1.36	.9190
I usually volunteer.	2.85	1.28	.8926
How often did you volunteer in the past 6 months?	1.51	1.50	.8691

Note. Scale from 1 'not true of me at all' to 5 'very true of me'; last item from 1 'never' to 5 'several times'

Note 2. Kaiser-Meyer-Olkin measure of sampling adequacy: 0.8502

A 6

Results of principal component analysis of attitude towards donating to environmental and humanitarian charities (N=833)

Cronbach's alpha: .8710	Mean	SD	Factor loading
A donation on my part to a humanitarian organisation within the next four weeks would be:			
useful - useless	3.32	1.10	.8061
satisfactory - unsatisfactory	3.43	1.10	.8252
positive – negative	3.50	1.10	.8269
A donation on my part to an environmental organisation within the next four weeks would be:			
useful - useless	3.27	1.14	.5873
satisfactory - unsatisfactory	3.32	1.10	.8001
positive – negative	3.50	1.10	.8378

Note. Kaiser-Meyer-Olkin measure of sampling adequacy: 0.8636

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