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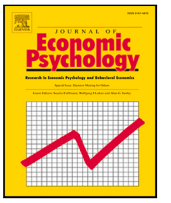

Information avoidance, selective exposure, and fake (?) news: Theory and experimental evidence on green consumption

Katharina Momsen, Markus Ohndorf *

University of Innsbruck, Austria

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ABSTRACT

We investigate self-serving information avoidance by consumers when revelation is stochastic and the revealed information is potentially erroneous. Our formal considerations based on a cognitive dissonance model suggest that the size of the price difference between product options determines if information avoidance arises. This prediction is supported by our laboratory experiment, in which subjects purchase products associated with co-benefits implemented as contributions to climate change mitigation. In seven treatments, we alter the information structure as well as the perceived revelation costs. We find robust evidence of self-serving information avoidance in treatments with simple stochastic revelation and reduced reliability of information, representing potential 'fake' news. The propensity to avoid information increases with the introduction of merely nominal information costs. In contrast to previous studies, we conclude that self-serving information avoidance can arise in consumption, which could also explain the persistent demand for products associated with 'green-washing'.

1. Introduction

In recent years, considerations of social responsibility and sustainability have gained in importance in every-day consumption decisions. Consumers can choose from a growing number of products with various environmental or otherwise ethically desirable co-benefits, coupling consumption with a contribution to a public good. With the extensive growth of regulated third-party labeling, we can observe an increasing differentiation in the type and level of these co-benefits (Gruere, 2013; Prag et al., 2016). At the same time, regulated labels continue to coexist with unregulated self-labeling featuring vague, unverified claims like "climate-friendly" (Klintman, 2016). Yet, with the advancements of modern information technologies, it has become easier for consumers to identify products that correspond to their green or social preferences. For many products, information to verify product claims can be found at negligible costs by the use of a search engine. However, searching for additional information on the actual co-benefits will not always yield results with certainty. Moreover, if there is risk of "fake news" in social and traditional media, consumers need to also take the reliability of information sources into account when comparing different products. Nevertheless, a rational consumer with green or other-regarding preferences would seek information on the actual size of co-benefits as long as information costs are sufficiently small.

However, in contrast to the prediction in standard micro-economic theory, there exists a pronounced human tendency to not use all available information on the consequences of a decision even if information is accessible without cost. As was first pointed out by Festinger (1957) within his theory of cognitive dissonance, people tend to avoid information that might be incongruent with their established attitudes while disproportionately seeking news that are congruent—a tendency that is referred to as selective exposure to

* Corresponding author.
E-mail addresses: katharina.momsen@uibk.ac.at (K. Momsen), markus.ohndorf@uibk.ac.at (M. Ohndorf).

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information.[1] More recently, economists have identified this behavior as one of the most effective strategies for motivated reasoning to reach favorable conclusions on the effect of own actions on others (Bénabou & Tirole, 2016; Gino et al., 2016; Golman et al., 2017; Grossman & van der Weele, 2017). Hence, by choosing to remain ignorant on the nature and scope of co-benefits associated with a product purchase, individuals could avoid the feeling of being morally obliged to buy more expensive products associated with a larger positive (or a smaller negative) effect on their environment. In the simplest case, consumers would avoid gathering information on product labels and buy the cheapest product which claims to satisfy their preferences regarding social responsibility or sustainability. Such a tendency for self-deception would have to be taken into account when it comes to regulating product claims.

The simple form of self-serving information avoidance has been established in a multitude of dictator game experiments (e.g. Dana et al. (2007), Feiler (2014), Grossman and van der Weele (2017), Spiekermann and Weiss (2016)). Subjects seem to prefer to preserve some 'moral wiggle room' (Dana et al., 2007) in order to behave selfishly without having to take potential harm imposed on others into account. There is, however, substantiated doubt whether such strategic ignorance also arises in a setup of household consumption. A market experiment presented in Pigors and Rockenbach (2016) provided no indication of information avoidance. Bartling et al. (2015) investigate social responsibility in an experimental market and find no evidence for self-serving information avoidance on the part of consumers.[2] They surmise that, in contrast to non-market situations, the market context already provides a justification for acting self-interestedly such that the exploitation of moral wiggle room as a strategy for self-deception becomes obsolete.

To shed some light on the matter, it is useful to investigate the behavioral foundations of strategic ignorance as well as the informational contexts arising in consumption decisions in more detail. For this we consider more complex information structures which are commonly used in information economics. Typically, purchase decisions in consumption contexts are subject to a richer information structure than simple avoidance of certain information as was investigated in the literature thus far. As experimental evidence in the context of donations to charities suggests, risk and uncertainty can act as situational excuses to reduce altruistic giving and exploit moral wiggle room (Exley, 2016; Garcia et al., 2020). It is plausible that this mechanism is also at work in the context of information acquisition itself. In contrast to a completely rational individual, consumers might be tempted to avoid gathering costless information if revelation is less than certain. Furthermore, with a multitude of information sources on product qualities to choose from, consumers could also be tempted to selective exposure of information, i.e. to avoid potential 'bad news' and exclusively seek 'good news' instead.[3] Finally, the possibility that news might be potentially 'fake' or unreliable might also provide a convenient excuse to entirely disregard these sources of information.

In this paper, we present an experimental study on such biases in the context of 'green' consumption. We derive our hypotheses by extending the economic formalization of cognitive dissonance theory, established in Rabin (1994, 1995), Konow (2000) and Nyborg (2011), to account for simple information avoidance as well as selective exposure. Our model has the advantage that uncertainty does not enter as an exogenous situational excuse, but has a direct effect on the trade-offs considered within the individual optimization of overall monetary and non-monetary payoffs. The main theoretical result is that all forms of self-serving information avoidance will only arise within a specific range of product price differences for which the boundaries are determined by psychological factors. This might explain the absence of self-serving information avoidance in previous studies, which often featured particularly low price differences.

We test our hypotheses in an experiment on individual purchase decisions, where we implement three different treatment variations to investigate the effects of stochastic provision of information, the possibility for selective exposure, and the possibility of revealed information not being accurate. As the corresponding types of information avoidance are particularly conspicuous with respect to attitudes toward climate policy, product co-benefits are associated with the mitigation of climate change (Bolin & Hamilton, 2018; Jasny et al., 2015; Leviston et al., 2013). More precisely, subjects make repeated purchase decisions choosing between two different virtual products which differ in prices and associated contributions to high-quality carbon offsets. Information on the actual level of this contribution can be avoided. For each of these three variations of information structure, we implement two additional treatment variations with respect to the costs of information, which do not alter payoffs.

We find particularly robust evidence for the exploitation of moral wiggle room via information avoidance in the treatments with simple stochastic information, as well as in the case where news can be considered unreliable. Furthermore, the existence of nominal information costs increases the propensity to avoid information in the treatment with two information sources. In line with our theoretical predictions, information avoidance is more pronounced for decisions where the difference in prices is comparatively small and ultimately disappears in most treatments for high price differences. In these cases, the cognitive dissonance is resolved by simply admitting that the self-interest motive is stronger than the preference for a high contribution to carbon offsets.

Interestingly, we do not find exploitation of moral wiggle room in the case where subjects can selectively reveal good news and information is presented as costless. We surmise that, with two buttons placed in the center of the field of vision, the salience of the

[1] In social psychology this phenomenon has been examined in a vast amount of experimental studies (Hart et al., 2009; Knobloch-Westerwick et al., 2017; Smith et al., 2008).

[2] The phenomenon seems to remain elusive when considering the largest part of the respective literature. Several other studies also extend the analysis of self-serving information avoidance beyond the dictator game setup to situations involving contributions to charities or climate change mitigation (Felgendreher, 2018; Lind et al., 2019; Momsen & Ohndorf, 2020b). Yet, for situations where information is without cost, they do not provide evidence for this phenomenon. Ehrich and Irwin (2005) find some evidence for self-serving information avoidance in consumption decisions in a non-incentivized study.

[3] The human tendency to seek good news and avoid bad news has been investigated in other economic contexts (Coutts, 2019; Eil & Rao, 2011) as well as in legal decision making (Mischkowski et al., 2021). Spiekermann and Weiss (2016) test information avoidance with two different sources of information. Yet, in their experiment, payoffs change according to revelation behavior, which would not be the case with selective exposure.

possibility to reveal information is large enough for the costs of self-deception when remaining ignorant to be prohibitively high. Generally, selective exposure is uncommon, with the largest amount of incomplete revelation arising in the treatment with nominal information costs (about 10% of all decisions). Hence, we surmise that selective exposure is not likely to be a wide-spread strategy to reduce cognitive dissonance in similar consumption contexts. Instead, information avoiders mostly opt for complete avoidance of all information—a tendency that is more pronounced if information is perceived as unreliable or potentially 'fake'.

Our results have several interesting implications. First, they indicate that self-serving information avoidance can indeed arise in an individual purchase decisions. The existence of such a bias would provide an explanation for the persistent demand for products that could be easily associated with 'green-washing'. Second, our analysis sheds some light on the behavioral foundations associated with the well-documented polarization of worldviews often observed with respect to climate change mitigation. For treatments where information is perceived as less reliable we find highly significant levels of information avoidance. This indicates that disinformation campaigns labeling climate change information (e.g. on the effectiveness of mitigation options) as 'fake' do not only discredit the information source itself, but can also increase the disposition to remain entirely ignorant toward this topic.

The rest of the paper is organized as follows. In the following section, we present the experimental design. Section 3 presents the model and derives behavioral predictions. The results are presented in Section 4. Section 5 concludes. A translation of the instructions, screenshots of the decision screens and a detailed table of the implemented parameterizations are relegated to the supplementary material available online.

2. Experimental design

To investigate information acquisition on the consumption side, we implemented a consumption setup where subjects were to take the role of buyers while the supply side was computerized. Subjects needed to make 24 consecutive binary purchase decisions of virtual goods associated with a positive externality contributing to climate change mitigation. More precisely, each purchase decision consisted of choosing between products A and B, which differed in their prices as well as in a product-specific contribution to the purchase of actual carbon offsets. In each of the 24 purchase decisions, the subject was endowed with 100 Experimental Currency Units (ECUs) which she could spend on one of the two goods available. The subject's payoff in a round was calculated as the endowment minus the price of the selected product. Product prices varied between products within a round as well as over the different purchase situations. With prices ranging from 10 to 90 ECUs we exclusively implemented purchase decisions with a difference in prices of 10, 20 or 30 ECUs.[4] While the prices of both products were always disclosed, the observability of the externality on carbon abatement of product B varied between the different treatments. For product A, the contribution to the offset was always directly observable and equaled 20 ECUs throughout all 24 purchase situations. The contribution associated with product B was either 0 or 40 ECUs, with each amount being equally likely. For each purchase situation, the associated contribution was independent of the one realized in the previous round, such that subjects should consider each purchase decision separately. There existed, hence, two types of purchase situations. In the first type, the cheaper product was associated with the larger offset-contribution. In line with the literature on self-serving information avoidance, we refer to this type as aligned interests situation (AI). For the second type, referred to as conflicting interests situation (CI), the more expensive good was associated with the larger contribution to the carbon offset. Within the experiment we implemented 12 situations of each type, with the order of these 24 purchase decisions varying randomly between subjects.

2.1. Treatments

We implemented seven between-subjects treatments which differed with respect to the availability of information on the size of the externality associated with product B, the revelation process, the revelation costs and the reliability of the revealed information. In our baseline treatment, to which we refer as "Full Information" treatment, the associated investment in offsets for both products was immediately disclosed in all 24 purchase decisions. In all other treatments, the externality of product B was initially unknown in all rounds, but the subject could potentially reveal the offset-investment by clicking – depending on the treatment – one or two buttons on their decision screen. Hence, in all treatments with initially hidden information on product B, subjects could opt to remain uninformed and make their purchase decision without additional knowledge on the externality of product B. When opting to click a button, information about the true size of the offset-investment was revealed with a certain treatment-dependent probability. This probability did not vary over the 24 rounds of purchase situations and was communicated clearly in the instructions.

Variations in information structure

In the "One Button"-treatments (1BR), subjects could click a button labeled "Contribution: 0 or 40 ECUs?" to attempt to reveal the size of the contribution associated with product B. A button-click revealed the size of the contribution in 50% of all cases, with no additional information being revealed otherwise. This treatment hence diverges from the standard setups to test for self-serving information avoidance where information is generally revealed with certainty (as, for example, featured in Dana et al., 2007; Grossman & van der Weele, 2017; Momsen & Ohndorf, 2020b). Note, however, that even with the reduced chances to reveal the actual contribution, a rational agent with environmental preferences would always opt to reveal the information, at least as long as the costs for clicking the button remain negligible.

[4] For the full set of parameters, see Table A.3.2 in the supplementary material. Note also that in contrast to Momsen and Ohndorf (2020b), the unobservable component is restricted to product B, reducing the risk of subjects' misreading the choice situation to a minimum.

In the "Two Buttons with Reliable Info"-treatments (2BR), the contribution associated with product B was not disclosed upfront either, with the decision screen featuring two buttons. Button 1, labeled "Higher contribution than A?", exclusively revealed the true contribution in 50% of all cases when the underlying contribution indeed amounted to 40 ECUs. Button 2 was labeled "Lower contribution than A?" and revealed the true externality in 50% of all cases when the underlying contribution indeed amounted to 0 ECUs. In all other cases, a button-click did not reveal any additional information. Hence, in terms of information structure, each button was associated with a complete one-sided stochastic signal. Subjects were able to either click one button, both buttons or no button at all before taking the purchase decision. However, they could not click the same button twice. Note that, as both realizations for the true value of the contribution associated with product B were equiprobable, the *ex ante* probability of revealing the associated externality for one button was 0.25. Thus, *ex ante*, the probability to reveal the true value of the contribution when using both buttons was 0.5, i.e. the same probability as for the 1BR treatments. Hence, with negligible costs of clicking, a rational individual with environmental preferences would always use both buttons if the true value of the contribution was not revealed with the first button-click.

The "Two Buttons with Unreliable Info"-treatments (2BU) were similar to the 2BR treatments, but included the possibility of the revealed information being false to represent potentially 'fake' news. Button 1, labeled "Higher contribution than A?" revealed an offset-contribution of 40 ECUs with a relative frequency of 0.33 across all 24 purchase situations, which corresponded to eight cases with revealed information. However, only for six of these cases the information was actually correct. On each decision screen, the subjects were reminded of the corresponding probabilities which had already been explained in the instructions: A click of a button revealed information with a probability of 1/3, but with a probability of 25% the revealed value was false. Button 2, labeled "Lower contribution than A?", was introduced analogously for the value of the contribution being 0. Hence, in terms of information structure, each button was associated with an incomplete one-sided stochastic signal with a one-sided error.[5] Note that, in this case, there existed the possibility that both buttons revealed information when clicked, in which case a rational individual would reach the conclusion of both values of the externality being equiprobable. The same holds for situations where both buttons revealed no information. In these two cases, clicking both buttons did not increase the subject's knowledge on the actual value of the contribution. However, in cases where one button revealed information and the other did not, the probability of a correct guess was 75%. Hence, again, while the revealed information was less reliable than in treatment 2BR, a rational individual with green preferences would always opt to click both buttons.

Variations in nominal information costs

In addition to the above-described variations in the information structure, we varied the presentation of the costs to reveal information. For each treatment variation – 1BR, 2BR, and 2BU – we implemented a "costless" treatment in which the click of a button was not associated with any type of cost. In a second treatment variation, referred to as "costly", the click of a button was associated with a very small nominal amount to be paid for clicking a button, which was, in fact, not payoff-relevant. In the 1BR treatment with costly revelation, these nominal costs were 0.2 ECUs, while in the 2BR and 2BU treatments clicking *each* button was associated with 0.1 ECUs such that the nominal costs of clicking *both* buttons also amounted to 0.2 ECUs. Note that these amounts represent at most 0.2% (0.1% if just one button was clicked in the "Two Buttons"-treatments) of the subject's endowment and could be considered particularly low. The exchange rate used to convert ECUs into Euros was 0.15, i.e. in monetary terms, the nominal costs amounted to 3 Cent, which by itself could be considered to be (almost) negligible. Yet, the subjects were also made aware that their final payoff would be rounded up to the next full 10 Cent amount. Hence, as only one randomly drawn purchase decision determined the payoff from the main experiment, the subjects could easily identify the information cost to be not payoff-relevant. We included this treatment variation to capture situations where information on externalities is often available, yet it takes a negligible amount of effort to gather, which may be taken as an excuse to remain ignorant.

2.2. Experimental procedure

The experimental sessions were run in May and June 2019 in the Innsbruck EconLab. The experiment was programmed in zTree (Fischbacher, 2007) and subjects were invited through hroot (Bock et al., 2014). In total, 405 subjects – mainly undergraduate students from all fields – participated in seven between-subjects treatments earning on average €12.50. The total amount invested in carbon offsets projects was 1314 Euro.[6] A session lasted approximately 45 min. We planned with two sessions à 24 participants for both the full information and the "One Button" treatments. This number of participants is in line with the previous literature and should yield enough power to detect exploitation of moral wiggle room.[7] Despite consistent overbooking of the lab capacity, the actual number of participants was slightly lower due to no-shows (see Table 1). As the design features allowed for more differentiated behavior in the "Two Buttons" treatments, we aimed at 72 participants per treatment here with the actual number again being slightly lower (see Table 1).

[5] Notice that option B can only have two states. Thus, an error over a signal indicating one specific state is technically one-sided.

[6] The acquired offsets were certified according to the Gold Standard, which is consistently associated with high values by market participants (e.g. Blasch and Ohndorf (2015)).

[7] To reach a power of 0.8 with an α of 0.05 in a χ^2-test in a cluster randomized design, 44 participants per treatment are necessary when the share of selfish choices is 0.4 in the full information treatment and 0.6 in the hidden information treatment. Each participant constitutes a 'cluster'. Since each participant faces 12 situations with conflicting interests, a cluster contains 12 observations. For the power calculation, we assume an intra-cluster correlation of 0.4.

Table 1
Treatments.

	Full Info	1BR	2BR	2BU
Costless	45	48	65	65
Costly		46	66	70

At the beginning of each session, subjects received the printed instructions which were also read out loud to create common knowledge. Afterward, subjects received information on carbon offsets on their screens and needed to answer a quiz which ensured that they could only participate in the experiment if they had understood the instructions correctly.[8] Each session was split into two parts. In the first part, we elicited our subjects' risk preferences using the lottery selection task suggested by Eckel and Grossman (2002).[9] Once all subjects had selected their preferred lottery, the main part of the experiment started.

The total payoff for each participant of this experiment was the sum of the earnings from the lottery selection task and the earnings from the payoff-relevant purchase decision. From the 24 rounds of purchase decisions, one round was selected randomly at the end of the experiment by letting a subject draw a numbered card from an unsorted card deck. In this payoff-relevant round, subjects earned their initial endowment of 100 ECUs minus the price they paid for the selected product. The payoffs from the two parts of the experiment were added and multiplied by 0.15 to determine the payoff in Euros. Before subjects were paid out, they were asked to answer an unincentivized questionnaire which elicited their demographics as well as their political and environmental preferences.

2.3. Information as an abstract signal

Investigating informational issues in the context of consumption choices, we interpret information on products which is accessible by consumers as *signals* with stochastic information value. This seems realistic, as not every search for information is necessarily successful, while consumers are likely to have at least a notion of how successful information retrieval will be when using a specific source of information. Note, however, that the informational context in our experiment is held abstract, i.e. there is no reference to a specific information source when clicking a button. We exclusively present what in signaling theory is referred to as "information structure". Our subjects are only informed about the probabilities with which information is revealed and is correct, without providing a narrative which might entail framing effects. This has the advantage that the signals associated with a button-click can be interpreted as any type of information, independent of what its source might be in the real world.

This abstract formulation of signals is useful when it comes to the interpretation of decisions in our context. Note that stochastic signals have, for example, been used to represent "news" in the sense of media output in general (Anderson & McLaren, 2012) as well as firm- or product-specific information provided by news organizations (Gentzkow & Shapiro, 2006). Thus, in the same sense (and with all the associated limitations) we can also refer to the information provided in our experiment as ''news".

Notice, however, that we exclusively investigate the consumption context. While households do not only consume products but also information on these products (e.g., "news" in the sense established above), they typically do not intervene in the production processes of either. For the single individual, as investigated here, the information structure is to be taken as given. Thus, our subjects cannot influence the creation of the product-specific signals, but act exclusively as its recipients.

To summarize, via our informational treatment variations we investigate three types of information structures, all of which are to induce a specific phenomenon:

- The *1BR treatments* feature one button which reveals the true type of product B with a probability lower than 1. The button thus reveals a complete, stochastic signal on the type of situation (i.e. AI or CI). We use this treatment in comparison to the FI treatment to investigate simple information avoidance under stochastic information.
- The *2BR treatments* feature two buttons which reveal either ''good news" or "bad news" with respect to the true type of product B with a probability lower than 1. These buttons thus each reveal a complete, one-sided stochastic signal with respect to the type of situation (i.e. AI or CI) with probability smaller than 1. These treatments are designed to investigate simple information avoidance (no buttons clicked), as well as selective exposure (only ''good news"-button used).
- The *2BU treatments* feature two buttons which reveal either ''good news" or ''bad news" with a certain probability of these news being erroneous. These buttons represent two incomplete, one-sided stochastic signals with a one-sided error on the type of situation (i.e. AI or CI). Thus, with each signal being potentially erroneous, the corresponding "news" is necessarily potentially "fake".

Note that in a real-world consumption situation the probabilities implemented here would be subjective, but need to be controlled for the purposes of our experiment. Our experiment is not supposed to represent how information is acquired and processed in such situations but to isolate the effects of the interactions between the reliability of signals and information avoidance.

Notice, however, that the reception and processing of "fake news" (in the sense of flawed media messages) seems indeed to resemble a decision situation with an erroneous signal as implemented here. Pennycook and Rand (2019a) find that the individual

[8] A translation of the instructions and the information provided on offsets can be found in the supplementary material.

[9] Table A.3.3 in the supplementary material shows the set of lotteries used.

belief in a news message being truthful seems to be determined via a subject's ranking over the trustworthiness of the different news sources. Such a ranking implies that the consumer of news attributes different levels of confidence in the veracity of messages published by different news outlets. These confidence levels could very well be represented for each source of information as a (subjective) Bernoulli probability distribution over the values "true" or "fake". This would then indeed lead to a decision situation under imperfect signaling, where the potential error for each specific signal is attributed a subjective probability weight.

3. Behavioral predictions

Most attempts to explain self-serving information avoidance evoke the concept of cognitive dissonance (e.g. Matthey & Regner, 2011; Nyborg, 2011). In the context of situations with potential moral wiggle room, a cognitive dissonance arises if the distributive decisions an individual considers appropriate may diverge from the choices she actually intends to make. The person can resolve this dissonance by adjusting either her expectation of appropriate behavior, her intended choice, or avoid the type of information which might reveal the inconsistency between intended choice and behavior that is considered appropriate. This latter strategy might also include partial information avoidance, i.e. selectively only seeking information that does not contradict the consistency of self-interest and green preferences, referred to as "selective exposure" to information (Hart et al., 2009; Knobloch-Westerwick et al., 2017; Smith et al., 2008).

Up to the present, economic formalization of cognitive dissonance has focused on the strategy to adjust beliefs and fairness considerations (e.g. Konow, 2000; Rabin, 1994; Spiekermann & Weiss, 2016). In the following, we extend this framework to also reflect complete and selective information avoidance in the context of "sustainable" consumption, in order to derive behavioral predictions for the different treatments of our experiment. Note that it is in the tradition of information economics to use the logical rigor of a formalized methodological framework when considering human decisions dealing with stochastic signals. It is, however, not necessary to follow our modeling approach in detail to understand the intuition of the hypotheses derived below. Thus, we opt for a short presentation of how a signaling approach can be integrated into a formal cognitive dissonance model to represent information avoidance and then only present the intuition behind our hypotheses. The formal considerations used to derive the hypotheses are relegated to the appendix.

Consider the binary purchase situation at the basis of our experiment. Denote with $\omega_B \in \{\underline{\omega}_B, \overline{\omega}_B\}$ the realized amount of offset contribution for product option B and with ω_A the certain amount associated with product option A, with $\underline{\omega}_B > \omega_A > \overline{\omega}_B$. We define the largest achievable offset contribution $d = max\{\omega_A, \omega_B\}$, such that for equal product prices, an individual with green preferences would prefer the option associated with d. However, both products differ in prices, with the self-serving option denoted s for which $p_s = min\{p_A, p_B\}$.

Cognitive dissonance occurs if individuals with (sufficiently intensive) green preferences choose the self-serving product option s, while $\omega_s < \omega_{\neg s} = d$, i.e. if interests are conflicting. Following Rabin (1994), we denote the costs from this dissonance when choosing option i as $\Phi(d - \omega_i; \alpha)$, with $\Phi(0) = 0$, $\Phi' > 0$, $\Phi'' > 0$, and parameter α representing the intensity of the green preference. Under complete information, and for an endowment m, the individual's valuations of both product options are

$$U_s = m - p_s - \Phi(d - \omega_s), \tag{1}$$

$$U_{\neg s} = m - p_{\neg s} - \Phi(d - \omega_{\neg s}) = m - p_{\neg s}. \tag{2}$$

Hence, under complete information, the selfish option is strictly dominated iff

$$\Phi(d - \omega_s) > \Delta_p = p_{\neg s} - p_s \tag{3}$$

Thus, for Δ_p large enough, the individual will choose the self-serving option counter to her ideal of an environmentally conscious choice. In contrast, if condition (3) does not hold, the individual will choose the more expensive product to avoid cognitive dissonance.

Let us now introduce the possibility of information avoidance as an additional strategy to reduce cognitive dissonance. For this, we assume the true value of ω_B to be initially unobservable, which implies that it is *a priori* unclear if interests are aligned or conflicting. Denote with σ_k where $k \in \{0, 1, 2\}$ a signal that the subject observes on the probability μ of interests being aligned, i.e. $\mu = P(\omega_s = d)$. For completeness, we allow for a $k = 0$, where σ_0 corresponds to the initial information of both options being equiprobable. The individual can now decide to actively reveal and attend to up to two additional signals, σ_1 and σ_2, which correspond to the information revealable within our experimental setup.

To also reflect the insights captured within previous models on cognitive dissonance, we allow for a deliberate miscoding of probabilities on the part of the individual, similar to the idea of denial proposed in Bénabou (2015), Bénabou and Tirole (2002). Thus, the subjective probability $\hat{\mu}_k$ might diverge from the objective probability μ after observing signal σ_k.[10]

[10] This assumption is introduced for completeness. Predictions on information avoidance could also be derived without introducing the possibility of misperception. Subjective probabilities could, for example, be formalized as proposed in Bénabou (2015):

$$\hat{\mu}_k = \frac{\mu}{\mu_k + \Lambda(1 - \mu_k)\rho},$$

with $\rho \in [0, 1]$ being the probability of self-deception, $\Lambda \in [0, 1]$ reflects honesty.

Hence, under uncertainty the expected costs of cognitive dissonance Φ_k after revelation of signal σ_k and choosing option s are determined by the individual's subjective beliefs on the probability of aligned interests as follows:

$$\Phi_k = \Phi_k\left(\hat{E}(d|\sigma_k) - \hat{E}(\hat{\omega}_s|\sigma_k); \alpha\right)$$

Note that under uncertainty, the individuals can manipulate their beliefs on the expected values of d and – if option B is chosen – ω_s itself.[11] This opens the possibility of opportunistically adjusting own beliefs to reduce the cost from cognitive dissonance as featured in previous models. Another strategy to reduce the cost of cognitive dissonance, which is of interest here, is to avoid information which, if revealed, might lead to an updating of beliefs that might increase the argument of $\Phi(\cdot)$. It is, however, to note that both of these strategies represent some sort of self-deception which, in turn, is likely to be associated with a feeling of displeasure with one's own self-serving rationalization. To take this into account, we follow Rabin (1994) further and introduce costs of self-deception which are increasing in the misperception of probability μ and dependent on the amount of available information revealed, i.e. the value of k.[12] The costs of self-deception for k signals revealed are

$$\Psi_k = \Psi_k\left((\hat{\mu}_k - \mu_k), k; \beta\right).$$

A higher β represents a greater sensitivity to self-deception, which varies across individuals as well as with contextual variables. In particular, we conjecture that beyond their direct effect on payoffs, information costs can also serve as an additional situational excuse to avoid information, lowering the cost of self-deception (Frey, 1981, 1986; Smith et al., 2008). To test this conjecture, we introduced payoff-irrelevant information costs within our 'costly' treatment. While these are only costs by name, it is still possible that the experimental subjects do not realize their irrelevance to their payoff. Hence, these costs can only be considered situational excuses if the effect of these costs on purchase decision is larger than a marginal increase in Δ_p under full information, which was, as shown below, indeed the case in the relevant treatments.

Given these assumptions and for k signals revealed, the valuation of the self-serving option s is

$$U_k(s) = m - p_s - \Phi\left(\hat{E}(d|\sigma_k) - \hat{E}(\hat{\omega}_s|\sigma_k)\right) - \Psi_k(k, \mu_k - \hat{\mu}_k; \beta) \tag{4}$$

In order to analyze the tendency to avoid information for the different information structures investigated in our experiment, we will compare, in the following, the expected utilities from revealing a signal (i.e. specific forms of (4)) with the expected utilities in case the signal is not revealed. This allows us to establish the price ranges under which a single individual prefers to avoid information. From the structure of the boundaries of these ranges, we can then establish hypotheses for observable shares of information avoidance under the assumption that environmental preferences (i.e. the disutility from $d - \omega_s$) diverge within our sample. Note that this corresponds to the standard strategy in information economics to establish payoff ranges for which a specific informational constraint does or does not hold. As with most models with multiple signals, deriving the formal representation of our comparisons are comparatively heavy on notation, but not necessary to understand the intuition of how our hypotheses are derived. Therefore, we relegate our formal considerations to the appendix and only present the information structures and the corresponding intuition for our hypotheses here.

3.1. Single stochastic signal (1BR treatments)

First, consider the case of stochastic information revelation with a single signal, as represented within our 1BR treatment. With CI and AI situations being equiprobable ($\mu = (1-\mu) = 1/2$), the click of the one button in this situation corresponds to the revelation of a single signal (i.e. $k = 1$). The signal here reveals the true value of ω_B with a probability $r = 1/2$.

To identify the potential for self-serving information avoidance, consider an individual, which has green preferences strong enough such that, under certainty, condition (3) holds. Thus in a CI situation under full information, this individual will choose the "greener" option ($\neg s$). In the absence of cognitive dissonance, it would be rational for such an individual with green preferences to always reveal the signal and click the button in the HI treatment. However, if we allow for cognitive dissonance, this individual might choose to exploit moral wiggle room via information avoidance as a strategy to minimize the associated psychological cost. This is prone to happen if her expected costs of cognitive dissonance and self-deception in the uninformed state are not "too high" compared to the material gains from choosing the cheaper option s.[13]

Given this reasoning we can predict three types of behavior to be observed in our setups with hidden, but revealable information: First, for individuals with low or negligible levels of environmental preferences, condition (3) does not hold. These subjects will choose the self-serving option independent of the effect of their choice on others even under full information. Typically, such a "homo economicus"-type (Type 1) would be indifferent with respect to information revelation, as it has no value to her. Hence, the frequency of this type in our sample can be identified via the share of individuals opting for the self-serving option s in CI situations under full information. Second, a subject with sufficiently strong green or other-regarding preferences would always choose to reveal the effect of her decision on others and then act according to her preference (Type 2). Note that for such an individual the cost of cognitive dissonance from remaining uninformed are large enough to always guarantee revelation. Thus, the frequency of this type in our sample can be identified via the share of individuals opting for the "green" option ($\neg s$) in CI situations under hidden but

[11] Note that for $p_s = p_A$ the associated contribution to offsets is in fact certain, i.e. $\hat{E}(\hat{\omega}_s|\sigma_k) = \omega_A$.

[12] From a different perspective, such costs of self-deception might also be interpreted as guilt (Peeters & Vorsatz, 2021).

[13] See condition (6) in Appendix A.

revealable information. Finally, the third type has green preferences of intermediate strength such that (3) does hold in FI situations, but the costs of cognitive dissonance and self-deception from remaining uninformed are not large enough for the individual to reveal information in our HI condition. These subjects can be expected to avoid information. Thus the frequency of this type for our sample can be identified via the difference of self-serving choices in the hidden and full information treatments.[14]

Note that with increasing price differences, condition (3) is *ceteris paribus* less and less likely to hold. For large enough price differences, most individuals would deliberately choose to incur potential costs from not corresponding to their ideals as the material disutility from doing so becomes too large. Thus the larger the price difference, the larger we can expect the share of Type 1-behavior to be. Conversely, assuming a sufficiently large variation in environmental preferences in our sample, we can establish the following hypothesis:

Hypothesis 1: In the 1BR treatments,

(i) *the frequency of self-serving information avoidance is larger for smaller differences in prices.*
(ii) *the frequency of self-serving information avoidance is larger in the costly treatment than in the costless treatment.*

Note that, in principle, the same reasoning also implies that self-serving information avoidance begins to decrease if price differences become very small. In such a case, it is advantageous to trade-off a small material gain against the cost of cognitive dissonance. Thus, for very small price differences, most individuals with positive green preferences would choose to reveal information and choose the "greener" option $\neg s$ in CI situations. While we do not expect this to occur within the price range chosen here, this might explain why exploitation of moral wiggle room was not observed for the particularly small price differences realized in Bartling et al. (2015) and Pigors and Rockenbach (2016).

3.2. Two one-sided stochastic signals (2BR treatments)

Next, we consider the information structure implemented in our 2BR treatment. Here, subjects can reveal two stochastic one-sided signals, revealing certain information with probabilities $r_1 = 1/2$ and $r_2 = 1/2$ respectively. We denote with σ_1 the signal associated with "good news", i.e. revealing aligned interests arising with objective probability $\mu = 1/2$. Signal σ_2 corresponds to the button revealing conflicting interests, arising with probability $(1-\mu)$. An individual deciding to use the first signal will either reveal aligned interests with probability $r_1\mu$, or will not acquire any new information with the inverse probability. The situation is analogous for σ_2.[15]

Thus, in addition to complete information avoidance, where individuals would choose to not use either signal, this setup also allows for selective exposure. Selective exposure is identified if the subject chooses to only acquire signal σ_1 but not σ_2, even if the former turns out to be uninformative. As showcased in the formal considerations relegated to the appendix, it is *a priori* unclear if a rational individual prefers selective to complete information avoidance, as this depends on unobservable psychological costs. Obviously, a rational choice between both strategies depends on the relative size of the cost of self-deception after unsuccessful revelation of the first signal compared to the cost associated with the initial state $k = 0$. Hence, if $\Psi(\cdot)$ is strictly decreasing in k, selective exposure will arise more frequently. As little is known with respect to the behavioral underlyings in such situations, the 2BR treatment was designed to investigate this specific trade-off via comparison with the 1BR treatment.

Additionally, we can use our information economic considerations to formulate hypotheses with respect to the *observable* components of the decision situations at hand, notably the differences in payoffs. First, both types of self-serving information avoidance, complete and selective, can be hypothesized to depend on the relative size of Δ_p, similar to the considerations made for the single signal case. Second, we would expect the situational excuse of nominal information costs to also increase the frequency of selective exposure.

We thus state the following hypothesis:

Hypothesis 2: In the 2BR treatments,

(i) *the frequency of self-serving information avoidance increases for smaller differences in prices.*
(ii) *the frequency of self-serving information avoidance is larger in the costly treatment than in the costless treatment.*
(iii) *selective exposure is more likely to arise in the costly treatment.*

[14] This approach is standard to identify exploitation of moral wiggle room since Dana et al. (2007).

[15] The *ex ante* probability to reveal the situation when pre-committed to click both buttons is hence 1/2. If both signals turn out to be not informative, the individual's beliefs should not change and it is optimal to choose option s, as aligned and conflicting interest situations arise with equal probability.

3.3. Two one-sided stochastic signals with error (2BU treatments)

For our 2BU treatments, the information structure is more complex. Signals continue to be revealed with probability r_k, but revelation does not guarantee that the information is correct, i.e. $P_1(\omega_s > \omega_{\neg s}|\sigma_1 = 1) = \mu_1 < 1$. Thus, if information is revealed, it is potentially erroneous. In light of the interpretation of signals as news, one might hence say that the individual faces potentially "fake" news. In such a case, the decision-maker uses additional signals in order to further update their beliefs with respect to the trustworthiness of the respective information (source).

The setup used here is designed to ensure comparability of the results of the 2BR and the 2BU treatments. This has interesting implications with respect to the results of potential updating. As information of the first signal is to represent potentially "good" news, and the second signal potentially "bad" news, the veracity of the information acquired with the first signal (if informative) is put into question if the revelation of the second signal is also informative. More precisely, given all probabilities in the 2BU treatments are symmetric, two informative signals imply that equiprobability is to be expected, i.e. $P(\omega_s > \omega_{\neg s}|\sigma_1 = 1, \sigma_2 = 1) = P(\omega_s > \omega_{\neg s}|k = 0) = \mu_0 < \mu_1$. In this case, revealing both signals did not improve the belief on the type of option B. The objective probabilities do not diverge from equiprobability if either no additional information is acquired or if both signals contradict each other. Still, a rational individual would opt for clicking both buttons, as the corresponding gains in confidence can improve the probability of a guess being correct to 0.75. This would be the case if one button reveals information, while the other does not. Consequently, the intuition used to derive hypotheses (i) laid out in Section 3.1 still applies in the 2BU case, although the overall effect can be expected to be dampened due to the remaining uncertainty. Similarly, we can expect nominal information cost to be used as a situational excuse for non-revelation in the 2BU treatment, such that we should also find evidence for our hypothesis (ii).

Yet, most interestingly, as our setup allows for a direct comparison of the results for the 2BR and 2BU treatments, we can also formulate a comparative statement that should hold in our experiment. For this, notice that the expected gains from revelation are lower in the 2BU treatment, as any revealed result is true with probability 0.75 at best. Hence, as we assume in our theoretical approach that our subjects rationally compare the expected net utilities from revelation and non-revelation, we can expect complete information avoidance to arise *ceteris paribus* for a wider range of Δ_P in treatment 2BU than 2BR.[16] We can hence state the following hypotheses:

Hypothesis 3: In the 2BU treatments,

(i) *the frequency of self-serving information avoidance increases for smaller differences in prices.*
(ii) *the frequency of self-serving information avoidance is larger in the costly treatment than in the costless treatment.*
(iii) *complete information avoidance is more frequent than in the 2BR treatments.*

4. Results

Exploiting moral wiggle room

In order to determine if subjects remain strategically ignorant, we compare the share of selfish choices in conflict situations in the treatments with hidden information to the baseline treatment with full information. Note that only subjects in the full information treatment are immediately aware if a situation is associated with aligned interests (AI) or conflicting interests (CI). Subjects in the hidden information treatments, in contrast, need to actively reveal information in order to (potentially) gain information on the nature of the decision situation. Since revelation is stochastic, we focus in this part of the analysis on those decision situations in which the externalities can be actually revealed. In other words, we look into those cases where the subject had the possibility to become aware of the conflict situation they were in by clicking the available revelation button(s). Focusing the analysis on these observations ensures comparability to the full information treatment. If we detect significant differences in the share of selfish choices, we may conclude that subjects strategically remained ignorant in order to choose selfishly. Note that for now we do not consider the situations where even subjects who sought information remained uninformed due to the stochastic revelation process.

Fig. 1 and Table 2 summarize the share of selfish decisions in conflict situations across treatments for the price differences of 10, 20 and 30 ECUs. In Fig. 1, the height of the bars represents the share of selfish purchases. We observe that the share of selfish purchase decisions varies greatly between treatments. It is lowest in the full information treatment as well as in the 2BR treatment with costless revelation suggesting that in the latter treatment, self-serving information avoidance does not occur. For all other treatments, the results shown in Fig. 1 point to the fact that self-serving information avoidance is most pronounced for lower price differences: In the left subfigure with price differences of 10 ECUs, significant differences in bar length compared to the full information treatment exist. These differences are no longer present in the right subfigure where the price difference is 30 ECUs.

Table 2 lists the results of χ^2-tests adjusted for correlated data.[17] Note that for these treatments, the difference in selfish behavior compared to Full Information is significant at least at the 5%-level. For price differences of 10 ECUs, the results easily survive a Bonferroni–Holm correction for multiple hypothesis testing. We observe that the size of the difference in selfish choices in comparison to the full information treatment decreases and (with the exception of the 1BR costless treatment) ultimately disappears if price differences increase.

[16] It is plausible that, additionally, due to the lower reliability of information in 2BU, both cost components in Rabin's approach (i.e. Φ and Ψ) are lower in the case of non-revelation than for the 2BR treatment. This would strengthen the theoretical statement used to derive hypothesis 3(iii), but is not necessary. Thus, the hypothesis can be derived simply by use of standard information economics. See the model results in the Appendix A.

[17] For details on this test, see Donner (1989) and Jung et al. (2001). If not explicitly stated otherwise, all reported p-values result from such χ^2-tests for clustered data.

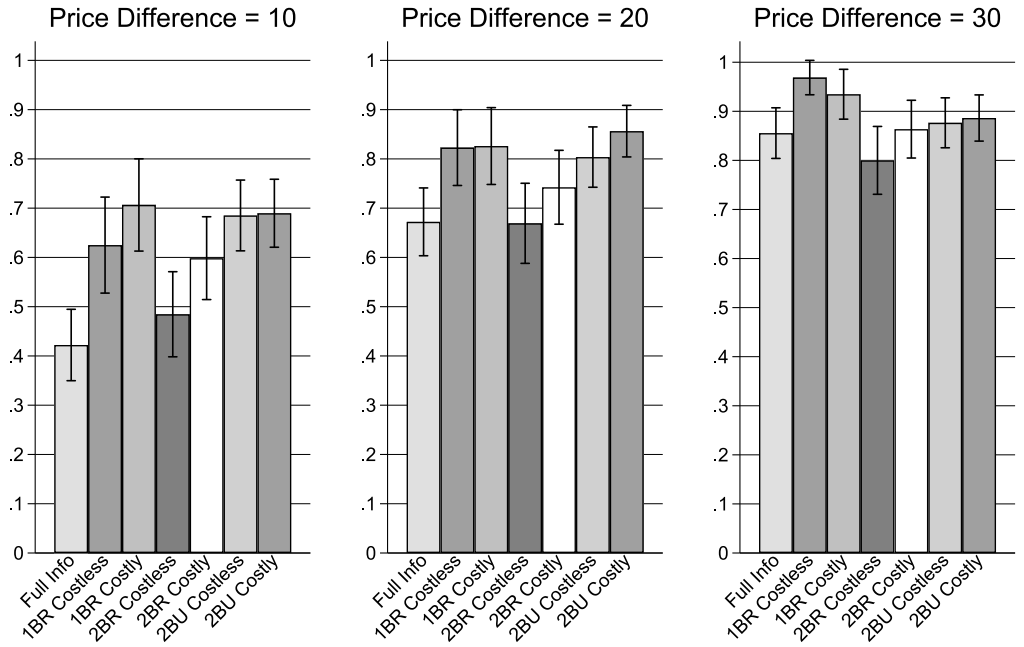

Fig. 1. Share of selfish purchases in revealable conflict decisions including 95% confidence intervals.

Table 2
Share of selfish purchases in revealable conflict situations.

Treatment	Price difference = 10			Price difference = 20			Price difference = 30		
	Mean	N	*p*-value	Mean	N	*p*-value	Mean	N	*p*-value
Full Info	0.422	180		0.672	180		0.856	180	
1BR	0.625	96	0.016	0.823	96	0.040	0.969	96	0.021
1BR Costly	0.710	92	<0.001	0.826	92	0.033	0.935	92	0.132
2BR	0.485	130	0.415	0.669	130	0.966	0.800	130	0.336
2BR Costly	0.598	132	0.020	0.742	132	0.299	0.864	132	0.872
2BU	0.685	162	<0.001	0.804	163	0.043	0.877	162	0.668
2BU Costly	0.690	174	<0.001	0.856	174	0.003	0.866	176	0.503

To be able to control for potential time trends and personal attitudes, we perform two random-effects logistic regressions (see Table 3) where the decision to purchase the cheaper product in a revealable conflict situation constitutes the binary dependent variable.[18] In both regressions – which differ in whether additional control variables are included (2) or not (1) – the full information treatment constitutes the baseline category. To identify potential exploitation of moral wiggle room, we include dummy variables for each treatment specification, 1BR Costless and 1BR Costly; 2BR Costless and 2BR Costly; 2BU Costless and 2BU Costly. A significant coefficient of the dummy indicates that subjects are more likely to choose selfishly in the respective treatment than in the full information treatment. We interact these dummy variables with the price differences to examine if the exploitation of moral wiggle room differs for increasing price differences. Thereby, a price difference of 10 ECUs constitutes the baseline.

The variable 'Period' stands for the number of the decision situation and is to capture potential time trends in the subject's decisions. In the second regression, we include controls capturing the subjects' risk attitude, gender, political preferences, honesty preferences and the subjects' opinion toward the existence and danger of climate change. We also control for the subjects' experience with and attitude toward carbon offsets. For the sake of readability and as we do not detect any systematic effects of the controls on the decision to choose selfishly, we do not report the coefficients of the control variables.

In both specifications, we observe that, under full information, decisions become more selfish with increasing price differences and over time, with the latter effect small in size. The significant coefficients of the dummy variables 1BR Costless, 1BR Costly, 2BR Costly, 2BU Costless and 2BU Costly indicate the presence of moral wiggle room exploitation in these treatments when the price difference is low (10 ECUs), while it appears to be absent in the 2BR Costless treatment. In the 2BU treatments and in the 2BR Costly treatment, the interaction terms of larger price differences and the treatment indicators have significant negative coefficients: Exploitation of moral wiggle room is less pronounced for larger price differences. To further analyze this finding, we consider the marginal effects. We observe that, in the 1BR Costly treatment and in the 2BU Costly treatment, the difference in selfish choices in

[18] Results are robust to the specification of the regression model. Moreover, the result of a Hausman test suggests a random effects specification.

Table 3
Regressions: Share of selfish purchases in revealable conflict situations.

	(1) No controls	(2) Controls
Period	0.024**	0.026**
	(0.009)	(0.009)
PD = 20	1.803***	1.796***
	(0.324)	(0.321)
PD = 30	3.486***	3.468***
	(0.426)	(0.420)
1BR Costless	1.345*	1.264*
	(0.553)	(0.542)
1BR Costly	1.897***	2.093***
	(0.581)	(0.579)
1BR Costless * PD = 20	−0.354	−0.297
	(0.552)	(0.562)
1BR Costless * PD = 30	0.305	0.407
	(0.889)	(0.897)
1BR Costly * PD = 20	−0.789	−0.828
	(0.486)	(0.494)
1BR Costly * PD = 20	−0.914	−1.030
	(0.697)	(0.680)
2BR Costless	0.406	0.574
	(0.529)	(0.514)
2BR Costly	1.182*	1.179*
	(0.512)	(0.507)
2BR Costless * PD = 20	−0.543	−0.433
	(0.408)	(0.403)
2BR Costless * PD = 30	−1.111	−0.931
	(0.568)	(0.561)
2BR Costly * PD = 20	−0.839	−0.737
	(0.430)	(0.430)
2BR Costly * PD = 30	−1.379*	−1.274*
	(0.542)	(0.543)
2BU Costless	1.710***	1.832***
	(0.490)	(0.476)
2BU Costly	1.754***	1.611***
	(0.497)	(0.489)
2BU Costless * PD = 20	−0.966*	−0.947*
	(0.437)	(0.437)
2BU Costless * PD = 30	−1.878***	−1.852***
	(0.549)	(0.544)
2BU Costly * PD = 20	−0.548	−0.469
	(0.426)	(0.421)
2BU Costly * PD = 30	−1.753**	−1.655**
	(0.573)	(0.571)
Constant	−0.855**	0.545
	(0.424)	(1.279)
Log pseudolikelihood	−1288.3906	−1246.1245
N	2901	2846

Notes: Dependent variable is a dummy indicating whether the subject chooses selfishly. Output from random effects logistic regressions. Cluster-robust standard errors in parentheses (on subject-level). Technical problems in the lab explain the difference in N. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

comparison to the full information treatment is no longer significant for price differences of 30 ECUs. In the 2BR Costly treatment and in the 2BU Costless treatment, the exploitation of moral wiggle room can no longer be found when the price difference exceeds 10 ECUs. Thus, our results lend support for our first set of hypotheses *(i)*, namely that self-serving information avoidance is more likely to occur when the difference in prices is small.

The fact that moral wiggle room is exploited in the 1BR costless treatment, but not in the 2BR costless treatment, is particularly interesting. Note that *ex ante* the probability to reveal the offset-investment when clicking the one button in the 1BR treatments is the same as with clicking both buttons in the 2BR treatments. The conditions for complete revelation are hence, in principle, the same for both treatment conditions. Yet, although the number of available buttons should be irrelevant for rational decision makers, who would always choose complete revelation, it has a significant effect on our subjects' behavior. A potential reason for this phenomenon may be that two buttons are more salient, as they occupy more space on the decision screen and are hence less easy to avoid than one button. Within our model, this would increase the cost of self-deception Ψ, which reduces the tendency to avoid information as a strategy to prevent cognitive dissonance. In this case, as argued above, information costs constituting an additional situational excuse are necessary to induce self-serving information avoidance.

Table 4
Regressions: Share of selfish purchases with respect to revelation costs.

	(1) 1BR	(2) 2BR	(3) 2BU
Period	0.019	0.020	0.032*
	(0.022)	(0.018)	(0.015)
Costly	0.537	0.841	0.018
	(0.525)	(0.483)	(0.325)
PD = 20	1.417**	1.348***	0.767**
	(0.447)	(0.270)	(0.265)
PD = 30	3.720***	2.526***	1.478***
	(0.823)	(0.418)	(0.320)
Costly * PD = 20	−0.429	−0.332	0.399
	(0.565)	(0.402)	(0.369)
Costly * PD = 30	−1.215	−0.332	0.112
	(0.947)	(0.541)	(0.480)
Constant	0.523	−0.384	0.613*
	(0.490)	(0.429)	(0.297)
Log pseudolikelihood	−219.030	−383.827	−452.570
N	564	786	1011

Notes: Dependent variable is a dummy indicating whether the subject chooses selfishly. Output from random effects logistic regressions. Cluster-robust standard errors in parentheses (on subject-level). The difference in N results from differences in the number of participants per treatments and a different share of conflict situations qualifying as revealable. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5
p-values: Comparison of selfish choices to the 2BR treatments.

	Price difference = 10		Price difference = 20		Price difference = 30	
	Costless	Costly	Costless	Costly	Costless	Costly
1BR	0.067	0.134	0.030	0.183	0.002	0.117
2BU	0.002	0.127	0.029	0.028	0.139	0.569

Revelation costs and wiggle room

To investigate the role of revelation costs, we run three separate random-effects logistic regressions for each treatment variation with respect to the information revelation (see Table 4). Comparing the share of selfish purchases within a treatment condition, but across cost scenarios, we do not observe significant differences in the share of selfish choices as the coefficient of the 'Costly' dummy is insignificant. This finding appears to contradict our hypotheses *(ii)* which postulates a positive effect of costs as situational excuses on self-serving information avoidance.

This result deserves some further attention for the 2BR treatments: While we find that the share of selfish choices in the 2BR treatments does not differ significantly across cost conditions ($p = 0.081$), the comparison of the share of selfish choices to the full information treatment identifies an exploitation of moral wiggle room in the presence of revelation costs and its absence without revelation costs. This suggests that, in this treatment, revelation costs may constitute a situational excuse to remain ignorant and choose selfishly.

Selfish choices across hidden information treatments

To investigate if the nature of the revelation process influences subjects' behavior, we compare the share of selfish choices across treatments. Aggregating over all price differences, selfish choices in the 1BR treatments and the 2BU treatments are statistically indistinguishable, both for situations with costly ($p = 0.779$) and costless ($p = 0.509$) revelation. Using the 2BR treatments as baseline, we find that the share of selfish purchases in the 2BR treatments is significantly smaller than in the other two treatment conditions, 1BR and 2BU, when revelation is costless and price differences lie below 30 ECUs (as shown in Table 5).[19] Hence, we find that the revelation process has a significant impact on selfish behavior.

Note that the only difference between the 2BU and the 2BR treatments is that for the 2BU treatments potentially revealed information is not entirely reliable. Again, in both cases a rational decision-maker would choose to completely reveal all available information. As reported in Table 5, we find a significant difference in selfish choices between the 2BU and the 2BR treatments, which hints to the fact that our hypothesis *3 (iii)* might find support here, which postulates more self-serving information avoidance in the 2BU than in the 2BR treatments. If potentially revealed information might be unreliable, this reduces the overall costs from self-deception and leads to an increase in selfish choices via self-serving information avoidance. However, for a clearer picture on the occurrence of selective exposure in contrast to complete information avoidance, we need to analyze the decisions to reveal information in more detail.

[19] Note that with a *p*-value of 0.067 the difference between the 2BR and 1BR treatment cannot be considered significant.

Table 6
Share of selfish choices in revealable conflict situations relative to information acquisition.

	Informed	Uninformed
Full Info	0.650	
1BR Costless	0.717	0.915
1BR Costly	0.467	0.921
2BR Costless	0.545	0.857
2BR Costly	0.408	0.886
2BU Costless	0.699	0.899
2BU Costly	0.544	0.875

Selfish choices of informed and uninformed subjects

In the following, we explore the decisions of (willingly) informed subjects and those who decided to remain uninformed in the treatments with initially unobservable information. The shares of selfish choices relative to the subjects' state of information on the externalities are reported in Table 6. Note that the first column refers to subjects that chose to click one or several buttons and information revelation was successful. The second column refers to subjects that preferred to remain uninformed (i.e. no button was clicked). It is immediately obvious from Table 6 that choices of those who remained uninformed are more selfish than choices made in the full information treatment. In fact, the increase in selfish decisions lies between about 20 and 27 percentage points, which is consistent with exploitation of moral wiggle room via information avoidance.

Table 6 is also useful to check if our results can be better explained by some sort of "rational ignorance" (Downs, 1957), which might be attributable to some hidden cognitive cost of information processing or cost of attention (Exley & Kessler, 2021; Pennycook & Rand, 2019b).[20] We do indeed find some evidence for inattention. As reported in Table 6, the share of uninformed selfish choices varies between 85.7% (2BR Costless) and 92.1% (1BR Costly). Clearly, this is irrational and can best be explained by inattention, as completely rational behavior would correspond to a share of 100%. Note, however, that our results are inconsistent with inattention as the predominant explanation for information avoidance. As also reported in Table 6, the share of willingly informed subjects that ultimately choose the self-serving option in CI situations varies between 40.8% (2BR Costly) and 71.7% (1BR Costless). We refer to this group as "curious egoists". Note that if information revelation were associated with costs, even if only in the cognitive sense, an otherwise rational agent who is pre-disposed to choosing the self-serving option in a CI situation would not want to incur these costs. Thus, such large shares of curious egoists cannot be explained by rational ignorance due to cognitive costs. In contrast, our model can indeed account for their existence, as such individuals would want to avoid Rabin's cost of self-deception (Ψ_0) even if their environmental preferences are not strong enough to choose option $\neg s$ when informed. Thus, our data are consistent with our theoretical considerations, while it is inconsistent with rational ignorance as an exclusive explanation for information avoidance.

Still, we observe that choices are less selfish for *willingly informed* subjects when revelation is costly as opposed to the treatments where revelation is costless. This suggests that the negligible revelation costs deter curious egoists to some extent from revealing information such that a larger share of less selfish subjects self-select into becoming informed. Furthermore, we find that informed choices in the 2BU treatments are more selfish than in the other treatments. This finding can be explained by subjects not fully trusting the revealed information or using the fact that information is unreliable as an excuse to act selfishly.

If revelation is costless, willingly informed subjects are about as selfish as subjects in the full information treatment. This finding constitutes a difference to previous papers where willingly informed subjects act less selfishly than automatically informed subjects (see e.g. Grossman & van der Weele, 2017). We conjecture that in our experiment with stochastic revelation, subjects are more likely to click in order to reveal information than in previous studies as in our setting, clicking might leave the subject uninformed while still reducing Rabin's cost of self-deception (Ψ_0), as explained above.

Revelation decisions

Complete revelation

Fig. 2 depicts the average share of complete revelations for each treatment, differentiating again between price differences. Note that in the 1BR treatments, revelation is considered complete if the subject made use of the button. In the 2BR treatments, revelations are complete if (a) the use of the first button led to information disclosure or (b) if this was not the case the subject also used the second button. In the 2BU treatments, revelations only count as 'complete' when both buttons are used.

From Fig. 2 we immediately observe that our nominal revelation costs have a large impact on the subjects' willingness to reveal information in each treatment condition and for all implemented price differences. The differences compared to the 'costless' treatments are all highly significant. This is particularly surprising, as these costs were not payoff-relevant. Interestingly, for the 1BR and 2BU treatments this effect does not carry over to the tendency to exploit moral wiggle room, which, as shown above, does not differ significantly for the 'costly' treatments. Hence, we conjecture that, when revelation is not associated with costs, also curious egoists of Type 1 choose to reveal information but refrain from doing so when the notion of information costs is invoked. For the 2BR treatments, where a tendency to exploit moral wiggle room only arises with the introduction of our payoff-irrelevant costs

[20] For experimental evidence for information avoidance in a Downsian framework, see Momsen and Ohndorf (2020a).

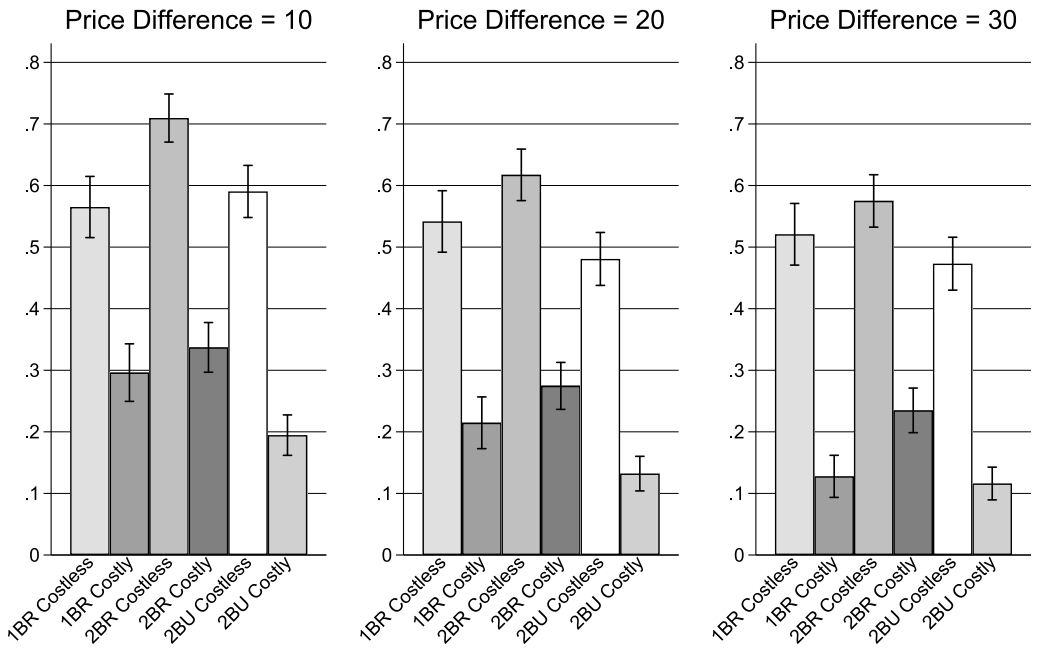

Fig. 2. Average share of complete revelations across treatments, 95% confidence intervals.

Table 7
Regressions: Complete revelations by revelation condition.

	(1) No controls	(2) Controls
Period	−0.017*	−0.018*
	(0.009)	(0.009)
Costly	−2.872***	−2.652***
	(0.284)	(0.289)
PD = 20	−0.454*	−0.458*
	(0.182)	(0.184)
PD = 30	−0.953***	−0.925***
	(0.246)	(0.248)
2BR	0.628	0.583
	(0.412)	(0.397)
2BR * PD = 20	−0.165	−0.216
	(0.222)	(0.225)
2BR * PD = 30	0.005	−0.111
	(0.296)	(0.298)
2BU	−0.257	−0.036
	(0.394)	(0.383)
2BU * PD = 20	−0.262	−0.283
	(0.240)	(0.242)
2BU * PD = 30	0.139	0.094
	(0.293)	(0.295)
Constant	1.175***	1.805
	(0.382)	(1.497)
Log pseudolikelihood	−3524.106	−3398.099
N	8640	8424

Notes: Dependent variable is a dummy indicating whether the subject reveals completely. Output from random effects logistic regressions. Cluster-robust standard errors in parentheses (on subject-level). Technical problems in the lab explain the difference in N. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

for price differences of 10 ECUs, one might argue that these costs indeed serve as an additional situational excuse for self-serving information avoidance.

In order to identify individual factors which may influence the tendency to ignore or reveal information, we present the results of two random-effects logistic regressions in Table 7. Standard errors are clustered on the subject level. The set of explanatory variables used in these regressions is specified as before in Table 3 with the 1BR treatment serving as baseline category.

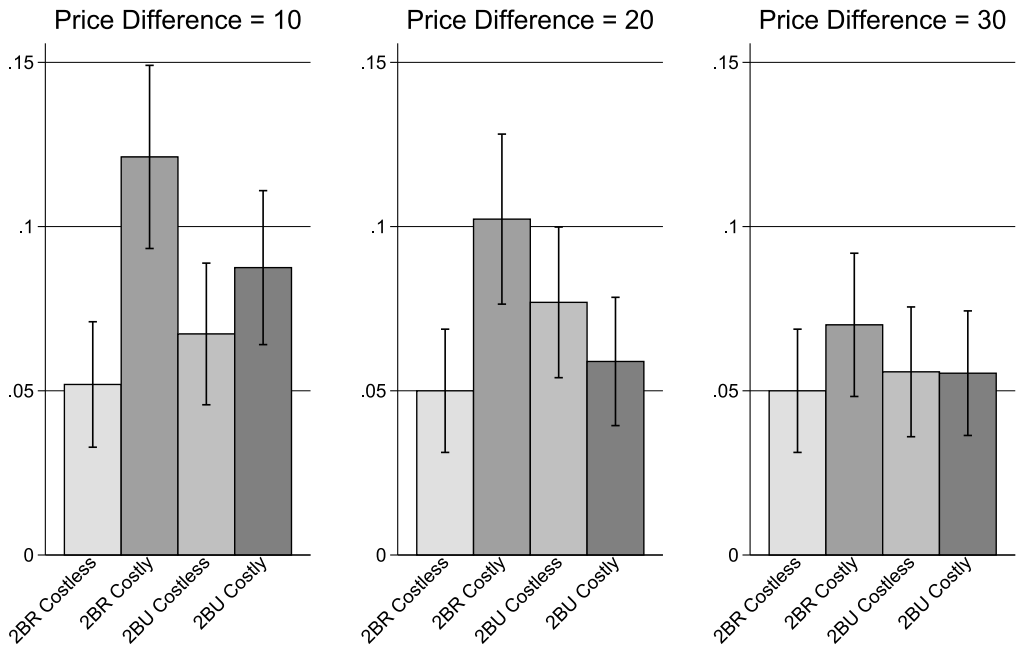

Fig. 3. Incomplete revelation across treatments.

In all treatment conditions the revelation costs, the price difference, as well as the round number, have a significant negative impact on the tendency to reveal completely. The dummy variables specifying the treatment conditions as well as the interactions between these treatment dummies and the price differences are insignificant indicating that the treatment does not influence the subjects' willingness to gather information, yet it does influence their willingness to use information.

Incomplete revelation and selective exposure

We now turn toward the decision situations in the "Two Buttons" treatments in which subjects decided to reveal information incompletely. This is the case if the individual clicks one button, which does not reveal the externality of product B *with certainty*, and then proceeds with purchasing a product without clicking the second button. Fig. 3 shows the share of incomplete revelations in these treatments, differentiating again between the price differences of 10, 20 and 30. While overall a relatively small share of decisions exhibit a pattern of incomplete revelation, there are significant differences between treatments: In the 2BR treatment condition, we observe a significantly larger share of such situations when clicking is costly than in the same treatment condition with costless revelation ($p = 0.016$ for all data and $p = 0.007$ for price differences of 10 ECUs). For the 2BU treatments, in contrast, the revelation costs do not seem to influence the tendency to reveal incompletely. Comparing the two treatments with costly revelation, more subjects seem to reveal incompletely in the 2BR treatment than in the 2BU treatment. While this finding appears to support our hypothesis *3 (iii)*, it does not reach significance at the 5%-level ($p = 0.088$, all data).

In order to explore if selective exposure is the main driver behind the observed share of incomplete revelation, we have to identify to what extent subjects sought confirmatory information, i.e. good news. Fig. 4 depicts the share of situations where confirmatory information was sought for all "Two Buttons" treatments. Note that the share depicted in Fig. 4 refers to those situations where incomplete revelation took place, i.e. the figure shows in what share of these situations subjects sought for good news.

In aggregate, only for the 'costly' 2BR treatment the frequency of exclusively seeking confirmatory information is significantly larger ($p < 0.001$, all data) than for seeking bad news.[21] This hints to the fact that information costs are not only a situational excuse for complete information avoidance, but also for selective exposure to information (hypothesis *2 (iii)*). Yet, even for the costly 2BR treatment, the share of incomplete revelation and, hence, selective exposure is rather small (see Fig. 3).

In summary, while we find particularly robust evidence for complete information avoidance in order to make use of the resulting moral wiggle room, the strategy to selectively look for confirmatory information does only play a minor role. In the "Two Buttons" treatments, Type 3-individuals make only rarely use of the possibility to selectively seek confirmatory information and instead opt for the same behavior exhibited in the 1BR treatments: They refrain from trying to reveal any type of information and remain completely uninformed.

[21] This finding also holds when considering price differences of 10 and 30 ECUs separately.

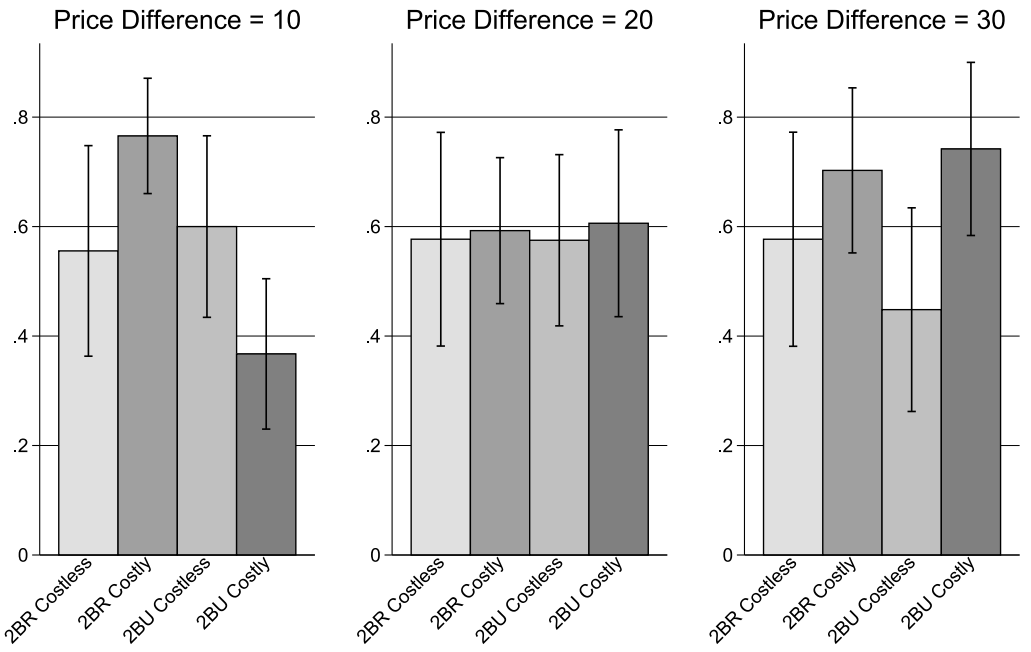

Fig. 4. Selective search for confirmatory information.

5. Conclusion and discussion

In our experiment on individual consumption, we find robust evidence for our prediction that the amount of self-serving information avoidance in the context of "sustainable" consumption depends on the price difference of available products. In all hidden information treatments except for costless 2BR, moral wiggle room is exploited via information avoidance if the price difference is sufficiently small. For larger price differences, our subjects seem to feel less obliged to consider the more climate-friendly product, which implies that cognitive dissonance is directly resolved in favor of the less expensive product option. Hence, information avoidance arises if it is a viable strategy to resolve the conflict between material interest and self-perception, which is, as our model results suggest, only the case for a specific range of price differences.

Interestingly, in our 2BR treatment, which allows for separate revelation of (reliable) good and bad news, no significant levels of information avoidance arise if information is not perceived as costly. Following the logic of our formal considerations, this might be explained by the salience of information availability if two buttons are displayed. The salience of offered information increases the cost of self-deception, possibly to a point where information avoidance is no longer a cost-effective strategy. This is in line with the alternative conjecture that the availability of diverse information tends to improve individual and group judgment (Guilbeault et al., 2018). However, with the additional situational excuse of token information costs, we detect a significant level of self-serving information avoidance also in the 2BR treatment for low price differences. While this is consistent with our predictions, the effect of this situational excuse does not seem to be additive. In our 1BR and 2BU treatments, where moral wiggle room is already exploited if information is costless, introducing token information costs does not significantly increase the effect of avoided information on product choice.

As to the use of selective information revelation as a strategic option, the evidence is limited. The largest share of selective revelation was observed in the 2BR treatment with nominal information costs, corresponding to only about 10 percent of all decisions. Hence, in our setting, *partial* information avoidance, or selective exposure, is not a widespread strategy to excuse selfish behavior. In fact, the largest part of our subjects choose to either completely reveal all information or revert to complete avoidance of information. It might, hence, be too obvious that one is about to deceive oneself if only one button is pressed.

In a more speculative interpretation, our results with respect to the 1BR and 2BU treatments suggest that strategic ignorance increases significantly if information provision is perceived as uncertain or potentially flawed. Note here that information avoidance arises, although it would be rational to always choose to reveal the information. This indicates that misinformation campaigns that are designed to cast doubt on available information (e.g. by questioning climate scientists' competence or motives) have two different effects. First, such campaigns are obviously intended to reduce the credibility of climate information itself (Swim & Bloodhart, 2018). Yet, second, our findings suggest that information that is successfully labeled as doubtful will often not even be revealed. In this case, voters or consumers will not even consider information from outlets that are perceived as a source of 'fake news', which contributes to the polarization of beliefs.

Our results also lend themselves to a more direct interpretation in the context of green consumption. Consumers of products labeled as environmentally friendly who avoid information about the exact scope of the co-benefits advertised can be expected to

be primarily motivated by the positive self-image associated with purchasing 'green' products. This type of consumer would have to treat the environmental component of 'green' goods as a credence good characteristic (Nyborg, 2011). This leads to the interesting case of an information asymmetry which is self-imposed on the part of the buyer. Hence, if frequent enough, information avoidance is likely to have an impact on the actual co-benefits of marketed products as well as their equilibrium prices. As a consequence, self-serving information avoidance can, to some extent, explain the differentiated demand on a segmented market for eco-labeled products. In these markets, the level of environmental co-benefits reflected by different labels can vary significantly. For example, the difference in co-benefits between self-labeled products and those labeled by a third party can be substantial (Baksi & Bose, 2007). In these cases, avoiding the information altogether would serve as an excuse to choose the cheaper options from the set of available eco-labeled products from the outset, which provides an explanation for persistent demand of products associated with 'green-washing' rather than actual environmental benefits (Momsen & Ohndorf, 2020b). In order to solve the problem of information avoidance on the consumer side, additional instruments might be required, such as the obligatory information on 'carbon baskets' as proposed in Kanay et al. (2021).

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Appendix A. Model results

A.1. Results for a single stochastic signal (1BR)

Consider the case of stochastic information revelation with a single signal. The signal here reveals the true value of ω_B with probability r. To identify the potential for self-serving information avoidance, consider an individual with green preferences for which, under certainty, (3) holds. For simplicity, we assume risk-neutrality.[22] The individual's expected valuation of the self-serving option s before the revelation of the information is then

$$EU_{k=1} = m - r\left(\hat{\mu} \cdot p_s + (1-\hat{\mu}) \cdot p_{\neg s}\right) - (1-r)(p_s + \Phi_1 + \Psi_1) \tag{5}$$

The decision to remain uninformed is determined via a comparison of (4) with k = 0 and (5). Thus, information avoidance will arise iff $U_0(s) > EU_{k=1}$ which is the case for

$$\Delta_p > \frac{1}{1-\hat{\mu}}\left[\Phi_0 + \frac{\Psi_0 - (1-r)\Psi_1}{r}\right]$$

Taking also condition (3) into account, we can establish a price range, where such information avoidance is self-serving. Information avoidance leads to the exploitation of moral wiggle room iff

$$\Phi(d-\omega_s) > \Delta_p > \frac{1}{1-\hat{\mu}}\left[\Phi_0 + \frac{\Psi_0 - (1-r)\Psi_1}{r}\right] \tag{6}$$

Derivation of the hypotheses:

If (6) holds, there exists a range of price differences for which information avoidance will occur. Assuming a sufficiently large variation in environmental preferences in our sample,

(i) the left hand side of (6) is less likely to hold for an increasing amount of subjects if Δ_p increases, from which hypothesis 1(i) immediately follows.

(ii) With the introduction of nominal information cost acting as situational excuse, cost of self-deception Ψ_0 and in particular the term $(\Psi_0 - (1-r)\Psi_1)$, decreases. Thus, the right-hand side of (6) is relaxed, from which hypothesis 1(ii) immediately follows.

[22] Elicited risk preferences did indeed neither have a significant effect on the decision to reveal, nor on the decision to choose selfishly when remaining deliberately uninformed.

A.2. Results for two complete signals (2BR)

Subjects can reveal two stochastic one-sided signals, revealing certain information with probabilities r_1 and r_2 respectively. We denote with $k = 1$ the information associated with "good news", i.e. revealing aligned interests arising with objective probability μ. Signal $k = 2$ corresponds to the button revealing conflicting interests, arising with probability $(1 - \mu)$. For ease of presentation we define $q = r_2(1 - \hat{\mu})$.

An individual deciding to use the first signal will either reveal aligned interests with probability $r_1\mu$, or will not acquire any new information with the inverse probability. The situation is analogous for σ_2. If conflicting interests are revealed and condition (3) holds, the subject will choose the more expensive option. If both signals turn out to be not informative, the individual's beliefs should not change, i.e. $\Phi_2 = \Phi_0$, whereas $\Psi_2 < \Psi_0$ as information avoidance was not chosen as a strategy for self-deception. Thus, the ex ante expected valuation of the self-serving option s before revealing all available information is

$$\begin{aligned} EU^2 = m &- r_1\hat{\mu} \cdot p_s \\ &- (1 - r_1\hat{\mu})\hat{q} \cdot p_{\neg s} \\ &- (1 - r_1\hat{\mu})(1 - \hat{q})(p_s + \Phi_2 + \Psi_2) \end{aligned}$$

In this case, $EU^2 > U_0$ iff

$$\Delta_p < \Psi_2 + \Phi_0 - \frac{\Psi_2}{\hat{q}} + \frac{\Psi_0 + \hat{\mu}r_1\Phi_0}{\hat{q}(1 - \hat{\mu}r_1)} \tag{7}$$

Note that the individual could opt to acquire the first signal but (if unsuccessful to reveal information) not the second, which corresponds to selective exposure. The expected valuation of the self-serving option s when only revealing the first signal at $k = 0$ is

$$EU^1 = m - r_1\hat{\mu} \cdot p_s - (1 - \hat{\mu}r_1)(p_s + \Phi_1 + \Psi_1)$$

Thus, $EU^1 > U_0$ iff

$$\frac{\Psi_1 - \Psi_0}{\Psi_1 + \Phi_0} < \hat{\mu}r \tag{8}$$

Hence, the subject will reveal at least the first signal if (7) holds or/and (8) holds. If, in this case, $\sigma_1 = 1$, aligned interests are revealed with certainty. If $\sigma_1 = 0$, the expected valuation of the self-serving option s for revealing σ_2 becomes

$$EU^2_{\sigma_1=0} = m - \hat{q} \cdot p_{\neg s} - (1 - \hat{q})(p_s + \Phi_2 + \Psi_2)$$

In this case, $EU^2_{\sigma_1=0} < U_0$ if

$$\Delta_p > \Psi_2 + \Phi_0 + \frac{\Psi_1 - \Psi_2}{\hat{q}} \tag{9}$$

Notice that conditions (7) and (9) will hold simultaneously if and only if (8) holds with strict inequality. Given this convenient property, we can establish that selective exposure arises for $\Phi(d - \omega_s) > \Delta_p$ iff the following holds:

$$\Psi_2 + \Phi_0 - \frac{\Psi_2}{\hat{q}} + \frac{\Psi_0 + \hat{\mu}r_1\Phi_0}{\hat{q}(1 - \hat{\mu}r_1)} > \Delta_p > \Psi_2 + \Phi_0 + \frac{\Psi_1 - \Psi_2}{\hat{q}} \tag{10}$$

Conversely, it follows that complete information avoidance arises for $\Phi(d - \omega_s) > \Delta_p$ iff:

$$\Delta_p > \Psi_2 + \Phi_0 - \frac{\Psi_2}{\hat{q}} + \frac{\Psi_0 + \hat{\mu}r_1\Phi_0}{\hat{q}(1 - \hat{\mu}r_1)} < \Psi_2 + \Phi_0 + \frac{\Psi_1 - \Psi_2}{\hat{q}} \tag{11}$$

Notice that the second inequality in this condition implies that condition (8) does not hold.

From this we can state the following:

1. Both types of self-serving information avoidance, complete and selective, depend on the relative size of Δ_p and the costs arising in the context of selective exposure, analogously to the case of simple information avoidance established via condition (6) above. Hypothesis 2(i) immediately follows analogous to Hypothesis 1(i).
2. If information avoidance is complete or selective depends exclusively on the relative size of the cost of self-deception after unsuccessful revelation of the first signal Ψ_1 compared to the cost associated with the initial state $k = 0$. Hence, if Ψ is strictly decreasing in k selective exposure will arise. This would mean that the feeling of self-deception becomes smaller if "good news" are revealed compared to the completely uninformed state. This is, indeed, one of the assumptions made more or less implicitly within approaches explaining selective exposure in the tradition of Festinger (1957). However, it is not implausible that the costs of self-deception increase if only good news are revealed, as the possibility of revealing all information is even more salient if the individual already started doing so by acquiring the first signal. As a consequence, with selective exposure the self-deception might become even more obvious to the individual, such that $\Psi_1 > \Psi_0 > \Psi_2$. As these cost are unobservable, this issue is subject to exploration.

3. Recall that we conjecture the introduction of non-payoff-relevant costs to alter the parameter β such that the overall level of $\Psi(\cdot)$ is reduced. Note that this effect might be stronger for Ψ_1, as it also constitutes a convenient situational excuse to stop the process of seeking information after revealing the first signal. Hence, we can expect for the costly treatments not only an increase in complete but also in selective information avoidance compared to the costless treatments. Hypothesis 2(ii) immediately follows.

A.3. Results for two signals with potential error (2BU)

Given that all probabilities in the 2BU treatments are symmetric, two informative signals imply that equiprobability is to be expected, i.e. $P(\omega_s > \omega_{\neg s}|\sigma_1 = 1, \sigma_2 = 1) = P(\omega_s > \omega_{\neg s}|k = 0) = \mu_0 < \mu_1$. Thus, the objective probabilities do not diverge from equiprobability if either no additional information is acquired or if the acquired information is contradictive, such that we can reasonably assume $\Phi_2^{0,0} = \Phi_2^{1,1} = \Phi_0$. For the sake of tractability, we assume that our individual would choose the option $\neg s$ if $\sigma_1 = 0$ and $\sigma_2 = 1$. With this assumption our model should still provide qualitative predictions if the amount of subjects with relatively intensive green preferences is large enough within our sample.

At $k = 0$, the expected valuation of the self-serving option s for revealing both signals is

$$\begin{aligned} EU^2 = m &- r_1\hat{\mu}(1-\hat{q})\left(p_s + \Phi_2^{\sigma_1=1,\sigma_2=0} + \Psi_2^{\sigma_1=1,\sigma_2=0}\right) \\ &- r_1\hat{\mu}\hat{q}\left(p_s + \Phi_0 + \Psi_2^{\sigma_1=1,\sigma_2=1}\right) \\ &- (1 - r_1\hat{\mu})\hat{q}\cdot(p_{\neg s} + \Phi_2^{\sigma_1=0,\sigma_2=1} + \Psi_2^{\sigma_1=0,\sigma_2=1}) \\ &- (1 - r_1\hat{\mu})(1-\hat{q})(p_s + \Phi_0 + \Psi_2^{\sigma_1=0,\sigma_2=0}). \end{aligned}$$

Thus, the condition for $U_0 > EU^2$ is

$$\Delta_p > C_2 = \Psi_2^{0,0} + \Phi_0 - \Psi_2^{0,1} - \Phi_2^{0,1} - \frac{\Psi_2^{0,0}}{\hat{q}} + \frac{\Psi_0 + \hat{\mu}r\left((1-\hat{q})\left(\Phi_0 - \Psi_2^{1,0} - \Phi_2^{1,0}\right) - \hat{q}\Psi_2^{1,1}\right)}{\hat{q}(1-\hat{\mu}r)}. \tag{12}$$

The expected valuation of the self-serving option s for acquiring solely signal σ_1 is

$$EU^1 = m - p_s - r_1\hat{\mu}\left(\Phi_1^{\sigma_1=1} + \Psi_1^{\sigma_1=1}\right) - (1 - r_1\hat{\mu})(\Phi_1^{\sigma_1=0} + \Psi_1^{\sigma_1=0}).$$

Hence, $EU^1 > U_0$ if

$$\hat{\mu}r\left(\Psi_1^1 + \Phi_1^1\right) + (1 - \hat{\mu}r)\left(\Psi_1^0 + \Phi_1^0\right) > \Psi_0 + \Phi_0. \tag{13}$$

Selective exposure implies that only the first signal is revealed. In principle, this might occur for both states of σ_1. For $\sigma_1 = 0$ the expected valuation of the self-serving option s for acquiring the second signal is

$$EU_2^0 = m - (1-\hat{q})\left(\Psi_2^{0,0} + \Phi_2^{0,0} + p_s\right) - \hat{q}\left(\Psi_2^{0,1} + \Phi_2^{0,1} + p_{\neg s}\right).$$

In this case the second signal is not acquired if $EU_2^0 < U_1^0$, that is if

$$\Delta_p > C_1 = \Psi_2^{0,0} + \Phi_0 - \Psi_2^{0,1} - \Phi_2^{0,1} + \frac{-\Psi_2^{0,0} - \Phi_0 + \Psi_1^0 + \Phi_1^0}{\hat{q}}. \tag{14}$$

For $\sigma_1 = 1$, the second signal will not be acquired if

$$(1-\hat{q})\left(\Psi_2^{1,0} + \Phi_2^{1,0}\right) + \hat{q}\left(\Psi_2^{1,1} + \Phi_2^{1,1}\right) > \Psi_1^1 + \Phi_1^1. \tag{15}$$

Notice that this condition always holds if (12), (13), and (14) hold. Hence, for (13) and any realization of σ_1, there exists a range of Δ_p for which selective exposure arises, which is characterized by

$$C_2 > \Delta_p > C_1. \tag{16}$$

Conversely, complete information avoidance arises if

$$\Delta_p > C_2 > C_1. \tag{17}$$

From this we can state the following:

(1) Note that (16) and (17) are both dependent on unobservable cost. Thus it is subject to exploration if complete or selective information avoidance is predominant.

(2) Note that information avoidance only arises if either (16) or (17) holds in conjunction with (6). Thus, Hypothesis 3(i) immediately follows analogous to Hypothesis 1(i).

(3) Both C_2 and C_1 increase in initial cost of self-deception (i.e. Ψ_0 and Ψ_1^0, respectively). Thus, the right-hand side of (13) and (14) is relaxed with the introduction of nominal cost, from which Hypothesis 3(ii) immediately follows analogous to Hypothesis 1(ii).

(4) Notice that C_2 is strictly smaller than the right hand side of (7), we can hence expect a larger amount of complete information avoidance in the 2BU treatment than in the 2BR treatment. Hypothesis 3(iii) immediately follows.

Appendix B. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.joep.2021.102457.

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