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ORIGINAL PAPER

Detecting Greenwashing! The Influence of Product Colour and Product Price on Consumers' Detection Accuracy of Faked Bio-fashion

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Abstract

While there exists recent research about greenwashing in the context of branding and product packaging as well as advertising, we investigated greenwashing detection depending on the cues colour and price of the product itself. We hypothesized: The more the product cues fit to the mental representation of the corresponding category-prototype of bio (or non-bio) products, the more likely consumers classify the product to that category, are confident with the classification-decision and actually get deceived. In two studies, female consumers were asked to classify actual bio and actual non-bio fashion products from online shops as bio or faked bio. The bio-typicality of the colour of the product (Studies 1 and 2) and the price-level of the product (Study 1) were systematically varied. According to our assumptions, the probability to classify a product as bio or non-bio was higher when these product cues fitted to the expected status of the product. Furthermore, consumers reached higher classification accuracy when the colour (and the price) of the product fitted the actual status of the product. Unexpectedly, effects were independent from consumers' varying ecological context experience. Concluding, consumers got "successfully" greenwashed by just a bio-typical product colour and a high price what highlights the importance of stronger political regulations in the B2C sales market.

Keyword Greenwashing detection · Visual product cues · Match fit bias · Consumer classification judgment behaviour · Eco fashion · Consumer experience

Theoretical Background

In 2010, publications of the *Intergovernmental Panel on Climate Change* (*IPCC*) showed a rapid increase in global temperature, strongly influenced by anthropogenic factors, mainly caused by globalization and the consumption of first world countries (Hegerl et al.,

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2010; Lynas et al., 2021; Valodka et al., 2020). One example is the fashion industry (Fisher et al., 2008; Marcketti & Karpova, 2020; Moglia, 2018). The environmental impacts of the fashion industry comprise 8–10% of global CO_2 emissions, meaning four –five billion tons annually (Quantis, 2018); in 2020, textiles demanded 27% of greenhouse gas emissions in the European Union (European Environment Agency, 2022). The fashion industry is particularly responsible for a major water consumption, ranking textiles in the third place after food on the first and recreation and culture on the second place. Just by EU-27 households, this indicated about 4,000 million m^3 of blue water to produce and handle textiles purchased only in 2020. Also in its impact on land use, fashion is on third place (after food and housing), meaning $400m^2$ per person (8%) (European Environmental Agency, 2022). By including the whole life cycle of a fashion product, this industry is especially fast what results in lots of waste in a short time and accounts for 35% of primary microplastic released into the environment (Niinimäki et al., 2020; European Parliament, 2022). Accordingly, in December 2015, 195 countries determined common strategy targets for reducing greenhouse gas emissions via *The Climate Protection Agreement (Paris Agreement)* (United Nations, 2015). Therefore, environmental protection has become a central topic of regional and global importance (Kaiser et al., 1999; Ripple et al., 2021; Schlichting, 2013; Tang et al., 2004).

Consequently, with the wish to counteract climate change by a more environmentally sustainable life style, an increased interest in ecological products among consumers is obvious (Baiardi & Morana, 2021; Baum, 2012; Imkamp, 2000; Organic Trade Associations, 2020). A study by Kleene et al. (2020, p. 23) showed that 42% of German consumers found it very important to buy fashion environmentally friendly or fair produced (in comparison, only 18% regarding electronics). Fashion companies respond to this trend with the development of sustainable products (e.g., Nike; DeLong, 2009; Textile Exchange, 2021) and the communication of their sustainable activities (Leonidou et al., 2011; Reilly & Larya, 2018; Yang et al., 2017).

Greenwashing

Such marketing is called *green advertising*. Green advertising functions as a promotional message adapted to the needs and wishes of environmentally conscious consumers (Kärnä et al., 2001; Zinkhan & Carlson, 1995). Research shows that environmental advertisement and ecological packaging is positively correlated with purchase intention among socio demographically differing consumers (Ansar, 2013). With the establishment of more environmental importance and the need of companies to adapt come benefits in claiming products as “green,” even if they are not (e.g., Aggarwal & Kadyan, 2014; Lyon & Montgomery, 2015). This deception strategy is called *greenwashing*, and can be defined as “[t] he act of misleading consumers regarding the environmental practices of a company or the environmental benefits of a product or service” (TerraChoice, 2009; de Freitas Netto et al., 2020). In other words, companies exploit consumers that want to buy environmentally friendly products by deceiving them with greenwashing strategies for increasing the companies’ profit. In line, *advertising execution* focuses on how a message is presented, rather than what the message is about (Stanton & Burke, 1998). In the context of green advertising, with the strategy of *executional greenwashing*, images, sounds, symbols, and colours are deployed for misleading concerning ecological benefits (Parguel et al., 2015). Using implicit references to nature, with, for example, cues like natural colours, can deceive consumers by subtly triggering inferences to the prototype of the product category bio (Sundar & Kellaris, 2017). This connection is known as *nature imagery* (Hartmann et al., 2013) and can “successfully” raise consumers' perception of a brand's ecological image (Parguel et al., 2015). In a sum, with greenwashing, companies want to raise their profit by making use of the consumers' heightened interest in pro-environmentally friendly shopping while not selling products that actually protect the environment. In a total, this inhibits counteracting the anthropogenic reasoned climate change. Within the present two studies, we want to investigate on which level of product communication it is needed to prevent consumers to not fall for greenwashing by examining the influence of the colour and the price of the product itself on classifying the products as bio or non-bio.

Consumers' Greenwashing Detection

Rosch (1978) pointed out a category as a mental collection of objects that appear to be related in some way. When consumers classify a product, they search for information to judge if the product fits to an expected category (prototype) or not. To categorize the new representation and to make inferences about the product, they transfer information from that category to the novel item and compare it with the perceived cues (Murphy & Ross, 1994; Noseworthy et al., 2012; Stayman et al., 1992; Sujan & Bettman, 1989). The higher the perceived fit between a cue and a category, the more likely the classification into the corresponding category, particularly when motivation and processing intensity are low (Isen & Shalker, 1982; Sanbonmatsu & Fazio, 1990; Schwarz & Bless, 1992). Research pointed out that especially visual (and emotional) aspects of "green" campaigns can strongly enhance positive attitudes towards a brand (e.g., Hartmann et al., 2016; Hartmann & Apaolaza-Ibáñez, 2009; Matthes et al., 2014; Xue & Muralidharan, 2015). As a visual aspect, the colour green is often used for executional greenwashing (Pospíchalová, 2013). Green can be associated with concepts related to nature (Clarke & Costall, 2008; Lichtenfeld et al., 2012) and environmental friendliness (Lim et al., 2020).

When manipulating advertisements' claims with natural or green coloured visuals, consumers got greenwashed regarding the product's environmental effort and properties (Seo, 2010; Krafft & Saito, 2014). In addition, Xue and Muralidharan (2015) found an increased perceived brands' environmental effort for four different products by advertisements with only green coloured visuals. In a further study, the effect was strengthened by the additional combination with an environmental claim. Under these conditions, there was no difference in greenwashing between green coloured visuals and no visuals; revealing claims as determining factor. But were they absent, green colour also enhanced the consumers' perception of the brands' environmental effort. Concerning packaging, Seo and Scammon (2017) did not find effects for the influences of the colour green on the perceived brands' environmental impact (fictitious brand of an energy drink). However, combined with an environmental claim, the perceived environmental impact was increased compared to when the same environmental claim was presented with the colour red.

While there is research investigating the influence of colours in advertisement and packaging on the increase of the perceived environmental effort of the product or its brand, by our knowledge, no research on the influence of the colour of the product itself on falling for greenwashing deception exists so far. Targeting the B2C sales market opportunities of products that all consumers buy and that come in different product colours and with a variety of prices, the fashion industry is focused. Nearly the same everyday life product, for example, a long sleeve, is offered in a variation of production possibilities (e.g., bio versus non-bio), colours, and prices. From a practical buying behaviour perspective, so the probability to fall for greenwashing by product colour and product price is heightened when shopping fashion. In line with the research on advertisements and packaging, we assumed that consumers are influenced by the colour of the product in classifying a product as bio or non-bio. Products with typical bio colours (e.g., green; e.g., Lim et al., 2020) would more likely be judged as bio products than products with non-typical bio colours (e.g., red; e.g., Seo & Scammon, 2017) (*colour-bias-hypothesis*).

Furthermore, bio-fashion often comes in a premium, above-average price segment (Nimon & Beghin, 1999; Roberts, 1996), for example, due to higher costs of organic raw materials that implicate lower CO_2 emissions compared to synthetics like polyester (Altenbuchner et al., 2017; Brito et al., 2008; Casadesus-Masanell et al., 2009; Delate et al., 2020; Ellen MacArthur Foundation, 2017). In line, bio-fashion is also perceived by the consumers as more expensive than mainstream fashion (Kozar & Hiller Connell, 2017; Niinimäki, 2009). Additionally, (high vs. low) price information can influence the perception of (high vs. low) quality regarding virgin wool blazers (Rao & Monroe, 1988). Combining the increased trend of an environmentally friendly purchasing behaviour with the perception of higher quality by higher prices, it is not surprising that some consumers are not averse to pay more for mighty environmentally sustainable fashion, especially women (Laroche et al., 2001). The higher the sales price, and the lower the original production costs, the higher the companies' profit. With a product that actually does not fit bio standards, but gets sold for a price that justifies an actual "green" production, greenwashing becomes profitable. Therefore, we decided to also investigate the influence of price information on greenwashing detection ability. We assumed that classification of products as bio or non-bio also depends on the price of the product. Products with high prices (e.g., 150 Euros) would more likely be judged as bio products than products with low prices (e.g., 50 Euros) (*price-bias-hypothesis*).

By assuming a crucial role of product colour and product price in judgments about if a product is bio or non-bio, this judgmental bias should lead to higher classification accuracy when the colour of the product, bio-typical or non-bio-typical, fits to the actual status of the product, bio versus non-bio. So, we further assumed that consumers are more accurate in classifying bio and non-bio products when the actual status of the product (bio vs. non-bio) and the colour of the product (bio-typical vs. non-bio-typical) fit. For example, we expected an actual bio product with a typical bio colour (e.g., green) would be classified more accurately than an actual bio product with a non-typical bio colour (e.g., pink) (*colour-fit-accuracy-hypothesis*). Also, we expected a higher probability to classify bio and non-bio products accurately when the actual status of the product (bio vs. non-bio) and the price of the product (high vs. low) fit. For example, an actual bio product with a high price (e.g., 150 Euros) would be classified more accurately than an actual bio product with a low price (e.g., 50 Euros) (*price-fit-accuracy-hypothesis*).

When Consumers Are Confident with Classification

Greenwashing is "successful", when consumers get deceived. The assessments of the probability that a statement is correct are known as confidence judgments (Fischhoff et al., 1977). By our knowledge, there is no research about confidence for judgments in the specific field of greenwashing. As indirect reference, Choshaly and Tih (2015) offered a positive correlation of consumer confidence and beliefs towards eco-labelled products with the intention to purchase such eco-labelled products (see also Choshaly & Tih, 2017), what let assume that consumers who are highly confident that a product is bio also show a heightened probability to get deceived. The higher the confidence in a false classification decision, the more probable it is that the decision would be made and so for example an actualnon-bio product be judged as a bio-product. From a general perspective, confidence decisions can be explained by the *sensory sampling model* (Juslin & Olsson, 1997). It assumes balance or consistency of the information in the sensory trace as underlying decision mechanism. Furthermore, the higher the proportion of impressions that support the decision, the higher the confidence of that decision. Concluding, low variance of impressions (high consistency) increases the confidence that a decision is correct and high variance decreases it. An example of the explained mechanism are findings by Boldt et al. (2017). Participants had to judge the average colour (either red or blue) of eight colour-shapes simultaneously arranged to each other in a circle around a fixation point. Each stimulus was shown for 160 ms, and judgment had to be made in a speed response (limit of 1,500 ms). After the next 600 ms, the participants stated how confident they were with unlimited response time. The confidence in judging was greater the lesser the variability of colours was across the shapes (lesser variance from average colour).

Based on this reasoning, we expected higher confidence in classification decisions when the colour of the product (bio-typical vs. non-bio-typical) and the price of the product (high vs. low) are consistent and lower confidence when both are not consistent. In detail, we assumed higher classification confidence regarding bio-typical coloured products with high prices and non-bio-typical coloured products with low prices. In contrast, for bio-typical coloured products with low prices and non-bio-typical coloured products with high prices, we expected lower classification confidence (*colour-price-fit-confidence-hypothesis*).

How Classification Accuracy Correlates with Judges' Experience

By having focused on how consumers get greenwashed, also the perspective on what can help against this deception has to be investigated. Literature showed that especially women who tend to buy "green" are more skeptical towards "green" advertising (Shrum et al., 1995). Following, someone could hypothesize, these with ecological orientated (shopping) situations experienced consumers have a higher ability to detect the greenwashing deception (see Blair et al., 2010; Reinhard et al., 2013b; Stiff et al., 1989). There is little research investigating the influence of the concept experience on greenwashing detection with mixed results (Parguel et al., 2015; Schmuck et al., 2018a, b). According to Schmuck and colleagues (2018b), detecting greenwashed advertisements for coffee and a cleaning product (Study 2, manipulated claims and visual backgrounds) did not depend on neither environmental concerns nor environmental knowledge for German consumers. Environmental knowledge was measured with multiple-choice answer options regarding at first the pro-environmental meaningfulness of some presented symbols, second the most important source of air pollution, and third the recyclability of some products. These measurements do not depict a specifically contextual operationalization regarding the presented products. Given a more specifically contextual measurement, there are some indirect results from consumer psychology regarding the use of price-information for product quality judgment. Consumers highly familiar and low-familiar with women's blazers (knowledge about brand names, store names, technical terms, and appropriate usage situations) used (high vs. low) price information for (high vs. low) quality assessment of virgin wool blazers, and moderately familiar consumers did not (Rao & Monroe, 1988). Further indirect evidence can be provided by also mixed results in the field of lie detection. Some research did not find higher deception detection ability by experts like employment interviewers (Reinhard et al., 2013a) or, in forensic, police officers, detectives, judges, and psychologists (Aamodt & Custer, 2006).

Focusing on sports (Mann et al., 2007) and medicine and transportation (Gegenfurtner et al., 2011), meta-analyses of eye-tracking studies indicated that experts are faster and more accurate in picking up relevant perceptual cues than non-experts. Furthermore, in the explained study by Rao and Monroe (1988) showing a *labelled* blazer, price information was only used by low-familiar consumers for quality assessment, indicating the use of rather meaningful attributes under high familiarity. As an additional indirect reference, Lim et al. (2020) found out that (manipulated) heightened persuasive knowledge decreased positive attitude towards an advertisement with green elements and an environmental product claim. As the main direct reference, Parguel et al. (2015) measured context-specific knowledge (average carbon emission required for all new passenger cars by 2015 by the European Automobile Manufacturers Association agreement) to find out the influence of a greenwashed advertisement for a new automobile on the perception of a brand's ecological image. When presenting executional elements evoking nature (green plants) with environmental performance indicator information (CO_2 consumption per km), only non-experts were influenced.

The present paper addresses the issue by measuring individual environmentally orientated experience in a context specific way. Consumers experienced with behaving environmentally friendly and with buying bio should know that cues like colour of the product and price of the product can vary across different products and therefore use the deceiving cues for a classification judgment as bio or non-bio less. Concluding, we developed the *experience-accuracy-hypothesis*: Individual environmental experience correlates positive with the ability to correctly classify bio and non-bio products.

Study 1

Method

Participants

A total of 120 German women participated. They were recruited on the campus of the University of Kassel and via online social media. We tested only female participants and so presented only female long sleeves because of gender differences in clothes shopping and online shopping behaviour, inter alia indicating women as main purchasers of clothes (Hansen & Møller Jensen, 2009; Laroche et al., 2001; Lee, 2009; Pentecost & Andrews, 2010; Stuart, 2019). The mean age was 24.64 years ($SD = 5.14$, between 18 and 57 years; two participants did not report their age but did confirm they were older than 18 years). 55.00% university students, 33.33% with university degrees, 5.83% students in school, and 5.83% finished apprenticeship. 7.50% were without an own income, 3.33% had less than 250€ per month, 25.00% between 250€ and 500€, 47.50% 500–1,000€, 11.67% 1,000–1,500€, 4.17% 1,500–2,000€, and 0.83% more than 4,000€. Participants were recruited for a study on "Eco fashion." The Study lasted approximately 15–20 min. No incentive was offered for participation.

Post hoc power analysis (G*Power; Faul et al., 2007) for repeated measures, within factors MANOVA with $\alpha = 0.05$ and the lowest effect size found in Study 1 $f = 0.46$ (see results *colour-price-fit-confidence-hypothesis*, $\eta p^2 = 0.18$) for eight groups and two measurements with 120 participants yielded an actual power of 1.

Design and Conditions

The experiment was a computer-based laboratory study with a 2 (status of the product: bio vs. non-bio) × 2 (colour of the product: bio-typical vs. non-bio-typical) × 2 (price of the product: high vs. low) within-subjects design (see also Appendix A, Table A.1).

Stimulus Material

We chose (pictures of) long sleeves as our stimulus material because they passed our methodological criteria of counterbalancing status, colour, and price of the product. Levine et al. (2021) showed that by a minimum of 20 stimuli, the classification accuracy measurement gets valid. Following, we collected 32 long sleeves from real online shops, 16 actual bio (bio-labelled 100% bio textiles) and 16 actual non-bio products (not bio-labelled and not 100% bio textiles, matching the design of the equivalent bio product). We based our criteria for "bio textiles" on the European Commission's strategy and action plan for a sustainable and circular European bioeconomy (2018) that defines the bioeconomy as using renewable biological resources from the lands and sea. Our selection included long sleeves with bio-typical colours and non-bio-typical colours counterbalanced. In the bio-typical colour condition, we chose long sleeves with colours that occur typically in nature and so are assumed to match, in face validity, to a stereotypical perception of bio (Hartmann et al., 2013; Parguel et al., 2015). The bio-typical colours chosen were anthracite, beige, black, brown, grey, green, khaki, and white. For non-bio-typical colours, we selected long sleeves in artificial and intensely gaudy colours (blue, orange, pink, red, rose, turquoise, violet, yellow). For each colour, two long sleeves were picked, one actual bio and one actual non-bio product. Both bio and non-bio long sleeves had comparable mean actual prices in Euros (bio: $M=90.64$, $SD=32.16$, non-bio: $M=96.50$, $SD=78.78$). High priced were half of the bio long sleeves ($M=115.84$, $SD=22.85$) and half of the non-bio long sleeves ($M=145.45$, $SD=82.65$). The other half of the bio long sleeves ($M=65.44$, $SD=15.60$) and the non-bio long sleeves ($M=47.54$, $SD=31.47$) were low priced. To control other possible influences than our hypothesized colour and price of the product, long sleeves with comparable cut designs were chosen and their labels removed. Further, the positioning of the photograph of the long sleeves (from the front) as well as the backgrounds (white) were standardized. All pictures were relatively adapted into a height of 400px. Information about the original price was added on the top right side of each picture (see also Appendix A, Table A.1).

Procedure

First, we thanked the participants and instructed them to treat all tasks with attention and conscientiousness. After signing an informed consent, they were asked about socio-demographics, including gender, age, educational status, and income.[1] Within-subject, a short informational text followed about the development of an ecological market and that deception strategies exist in declaring products as bio, also on some female long sleeves

[1] Results of the control variables (socio-demographics, political orientation, attention-check, and NFC) can be found for Study 1 in Appendix D and for Study 2 in Appendix F.

(Appendix B.1). With this background information we first clarified the relevance of the following task and helped to explain why participants had to detect deception (necessary to measure deception detection accuracy), and second, raised the motivation for the deception detection. Next, participants were instructed to uncover the fraud created by mislabelling. They were told that they will be presented 32 women's long sleeves, all of which have been passed off as bio products. Participants were instructed to judge, if these 32 presented female long sleeves were actual bio or non-bio. Then participants were informed about receiving feedback regarding the number of correctly classified long sleeves at the end of the Study (see also Appendix B.1).

All participants were shown all long sleeves one after another in randomized order. Under each presented long sleeve, participants judged it as "bio" or "non-bio" and rated on a percentage scale (from 0% = *not all sure* to 100% = *completely sure*) how confident they were with their decision (e.g., Li & Mattson, 1995). After this task, as a control variable, participants were asked about their political orientation (for detailed measure of political orientation for both studies, see Appendix C.1). Moreover, as a control variable, individual differences in cognitive motivation (*Need for Cognition*; Cacioppo & Petty, 1982) were accessed with the German short version of the *Need for Cognition Scale* by Bless et al. (1994).[1]

Next, general ecological behaviour was gathered with the *General Ecological Behavior Scale* (*GEB scale*) (Kaiser et al., 1999; Kaiser & Wilson, 2004). We chose this scale to attempt a measurement of behaviour rather than attitude because these both often are not directly related (Carrigan & Attalla, 2001; Crommentuijn-Marsh et al., 2010; Kaiser et al., 1999; Sheeran et al., 1999; Joergens, 2006). The GEB scale comprises items measuring ecological behaviours as well as counterpart (non-ecological) behaviours. An adapted German version by Arnold et al. (2018) in the original 38 items length by Kaiser (1998) without prosocial behaviour items (8 items) was used. So, participants were shown 30 items (e.g., "I buy articles in refill packs," or with reversed polarity, "For long vacations [6 h car trip or more] I take the plane"), and had to rate these on a 5-point Likert scale (1 = *never* and 5 = *always*). There was also an option to respond with "no answer"; as the authors suggested, participants were instructed to choose this option when the item did not fit to the participants' actual life situation. For example, someone with no driver's license could not really state something about driving style. Following Tang et al. (2004), attention check items were displayed (for detailed measure of attention check of both Studies see Appendix C.2).[2] Next, manipulation check was accessed. Participants decided for each of the 16 used colours if they perceived them as more likely non-bio-typical (chosen) or bio-typical (not chosen): "Which of these colors do you tend to NOT associate as Bio? (multiple choice)".

Participants were also asked to describe in their own words which classification strategy they used to identify the products as bio or non-bio "What do you think with which characteristics did you try the most to identify a long sleeve as Bio or non-Bio?". As a control variable, to check whether participants had an idea about the hypotheses of the Study, the following question was answered by the participants: "Do you have an assumption what the study was about?". Then participants got feedback about the number of correctly as bio and non-bio classified long sleeves. Finally, information followed that the shown long sleeves were only declared as faked bio labelled for the Study, not actually

[2] For the results of the classification strategy, see Appendix E (Study 1) and Appendix F (Study 2). Across both Studies, supplemental analyses of the reported classification strategies yielded no significant correlations with judgmental bias, classification accuracy, and classification confidence. For detailed results see Table E.1 (Study 1) and Table F.1 (Study 2).

faked bio labelled. Participants received a thank you, and the researchers' e-mail addresses were offered to direct questions.

Results

Classification of Colours

In line with our assumptions, pink (80.00%), violet (60.83%), turquoise (59.17%), yellow (43.33%), orange (43.33%), rose (42.50%), and red (40.83%) were perceived as non-bio-typical. As expected, black (23.33%), white (13.33%), grey (10.83%), green (10.00%), anthracite (7.50%), beige (7.50%), khaki (5.83%), and brown (5.00%) were less often judged as non-bio-typical colours. Unexpectedly, blue was also less often judged as non-bio-typical colour (24.17%).

Judgmental Bias

Overall, participants judged 46.98% ($SD = 13.30\%$) of the products as bio. This differed significantly from 50%, $t(119) = -2.49$, $p = 0.014$, 95% CI [44.57, 49.38], $d_{Cohen} = -0.23$, indicating a bias for "non-bio."

According to our *colour-bias-hypothesis*, a 2×2 ANOVA for repeated measurements with the independent variables colour of the product (bio-typical vs. non-bio-typical) and price of the product (high vs. low), and the dependent variable judgmental bias (bio judgments, in percentage) yielded a significant main effect for manipulation of colour of the product, $F(1, 119) = 104.58$, $p < 0.001$, $\eta p^2 = 0.47$. Products with bio-typical colours were significantly more often classified as bio ($M = 56.72\%$, $SD = 16.75\%$), 95% CI [53.69, 59.75] than products with non-bio-typical colours ($M = 37.24\%$, $SD = 17.06\%$), 95% CI [34.16, 40.32], $d_{RM,\ pool} = 0.76$.

Furthermore, in line with the *price-bias-hypothesis*, a significant main effect for manipulation of price of the product on judgmental bias was found, too, $F(1, 119) = 117.84$, $p < 0.001$, $\eta p^2 = 0.50$. Products with high prices were significantly more often classified as bio ($M = 57.24\%$, $SD = 18.83\%$), 95% CI [53.84, 60.64] than products with low prices ($M = 36.72\%$, $SD = 14.62\%$), 95% CI [34.08, 39.36], $d_{RM,\ pool} = 0.81$. There was no significant interaction between manipulation of colour of the product and manipulation of price of the product on judgmental bias, $F(1, 119) = 0.33$, $p = 0.570$, $\eta p^2 = 0.00$ (see also Fig. 1).

Classification Accuracy

Overall classification accuracy was 55.83% ($SD = 7.70\%$), significantly different from chance level (50%), $t(119) = 8.30$, $p < 0.001$, 95% CI [54.44, 57.22], $d_{Cohen} = 0.76$.

A 2×2×2 ANOVA for repeated measurements with the independent variables status of the product (bio vs. non-bio), colour of the product (bio-typical vs. non-bio-typical), price of the product (high vs. low), and the dependent variable classification accuracy (in percentage) was run. According to the *colour-fit-accuracy-hypothesis*, the analysis yielded a significant interaction for manipulation of status of the product and manipulation of colour of the product, $F(1, 119) = 104.58$, $p < 0.001$, $\eta p^2 = 0.47$. We found significantly higher classification accuracy for actual bio products with bio-typical colours ($M = 62.71\%$, $SD = 20.88\%$), 95% CI [58.94, 66.48] than for actual bio products with non-bio-typical

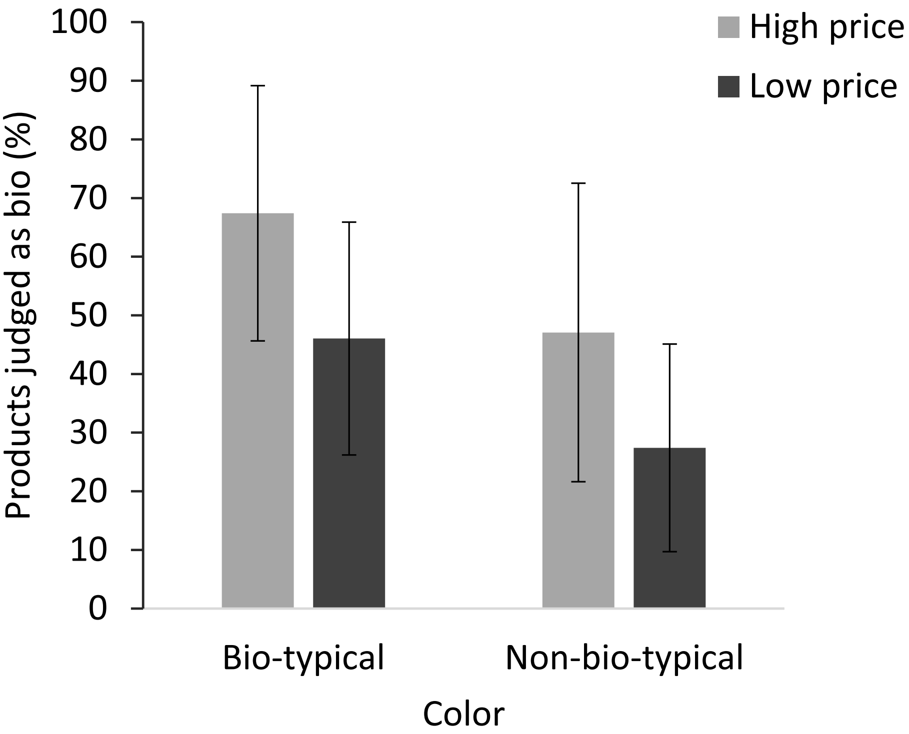

Fig. 1 Means in percentage of products judged as bio depending on colour and price of the product. Error bars represent the standard deviation of means

colours ($M = 42.92\%$, $SD = 21.48\%$), 95% CI [39.03, 46.80], $d_{RM,\ pool} = 0.57$ (see also Table 1). Furthermore, classification accuracy was lower for actual non-bio products with bio-typical colours ($M = 49.27\%$, $SD = 20.32\%$), 95% CI [65.23, 71.65] than for actual non-bio products with non-bio-typical colours ($M = 68.44\%$, $SD = 17.75\%$), 95% CI [45.60, 52.95], $d_{RM,\ pool} = -0.59$ (see also Fig. 2).

In line with the *price-fit-accuracy-hypothesis*, the analysis further yielded a significant interaction for manipulation of status of the product and manipulation of price of the product on classification accuracy, $F(1,\ 119) = 117.84$, $p < 0.001$, $\eta p^2 = 0.50$. Classification accuracy for actual bio products with high prices was significantly higher ($M = 60.00\%$, $SD = 21.60\%$), 95% CI [56.10, 63.90] than for actual bio products with low prices ($M = 45.63\%$, $SD = 19.62\%$), 95% CI [42.08, 49.17], $d_{RM,\ pool} = 0.42$ (see also Table 1). Classification accuracy for actual non-bio products with high prices was significantly lower ($M = 45.52\%$, $SD = 22.50\%$), 95% CI [41.45, 49.59] than for actual non-bio products with low prices ($M = 72.19\%$, $SD = 15.92\%$), 95% CI [69.31, 75.06], $d_{RM,\ pool} = -0.76$ (see also Fig. 3).

Moreover, the analysis yielded an unexpected significant interaction for manipulation of colour of the product and manipulation of price of the product on classification accuracy, $F(1,\ 119) = 19.63$, $p < 0.001$, $\eta p^2 = 0.14$. Products with bio-typical colours and high prices were classified significantly more accurately ($M = 55.94\%$, $SD = 16.28$), 95% CI [52.99, 58.88] than products with non-bio-typical colours and high prices ($M = 49.58\%$,

Table 1 Classification accuracy and classification confidence for the classified long sleeves depending on status, colour, and price of the product

	Status							
	Bio				Non-bio			
	Color							
	Bio-typical		Non-bio-typical		Bio-typical		Non-bio-typical	
	Price							
	High	Low	High	Low	High	Low	High	Low
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Classification accuracy	73.33% (25.67%)	52.08% (27.99%)	46.67% (30.22%)	39.17% (25.05%)	38.54% (28.60%)	60.00% (22.78%)	52.50% (29.60%)	84.38% (18.64%)
Classification confidence	60.01% (19.59%)	56.05% (19.48%)	55.55% (20.51%)	59.38% (20.52%)	58.31% (19.56%)	61.54% (18.90%)	57.73% (20.68%)	65.14% (20.19%)

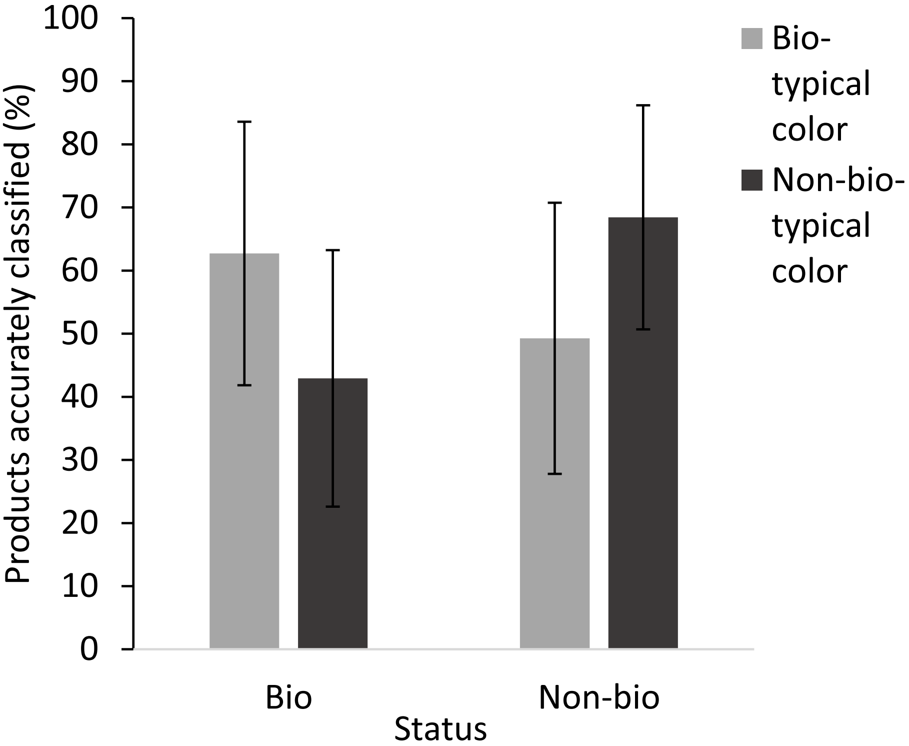

Fig. 2 Means in percentage of accurately classified products depending on status and colour of the product. Error bars represent the standard deviation of means

$SD = 15.71$), 95% CI [46.74, 52.42], $d_{RM,\ pool} = 0.21$. Products with bio-typical colours and low prices were classified significantly less accurately ($M = 56.04\%$, $SD = 16.04$), 95% CI [53.14, 58,94] than products with non-bio-typical colours and low prices ($M = 61.77\%$, $SD = 13.19$), 95% CI [59.39, 64.16], $d_{RM,\ pool} = -0.19$. Furthermore, also not assumed, a significant main effect for manipulation of status of the product on classification accuracy was found, $F(1,\ 119) = 6.19$, $p = 0.014$, $\eta p^2 = 0.05$. In line with the judgmental bias, participants classified actual bio products less accurately ($M = 52.81\%$, $SD = 16.24\%$), 95% CI [56.24, 61.46] than actual non-bio products ($M = 58.85\%$, $SD = 14.44\%$), 95% CI [49.88, 55.75], $d_{RM,\ pool} = -0.13$. In addition unexpectedly, there was a significant main effect for manipulation of price of the product on classification accuracy, $F(1,\ 119) = 19.07$, $p < 0.001$, $\eta p^2 = 0.14$, indicating significantly higher classification accuracy for products with low prices ($M = 58.91\%$, $SD = 18.75\%$), 95% CI [50.69, 54.84] compared to products with high prices ($M = 52.76\%$, $SD = 11.48\%$), 95% CI [57.05, 60.76], $d_{RM,\ pool} = 0.20$. No significant main effect for manipulation of colour of the product was found, $F(1,\ 119) = 0.05$, $p = 0.827$, $\eta p^2 = 0.00$, $d_{RM,\ pool} = 0.02$. Finally, no significant three-way interaction emerged, $F(1,\ 119) = 0.33$, $p = 0.570$, $\eta p^2 = 0.00$.

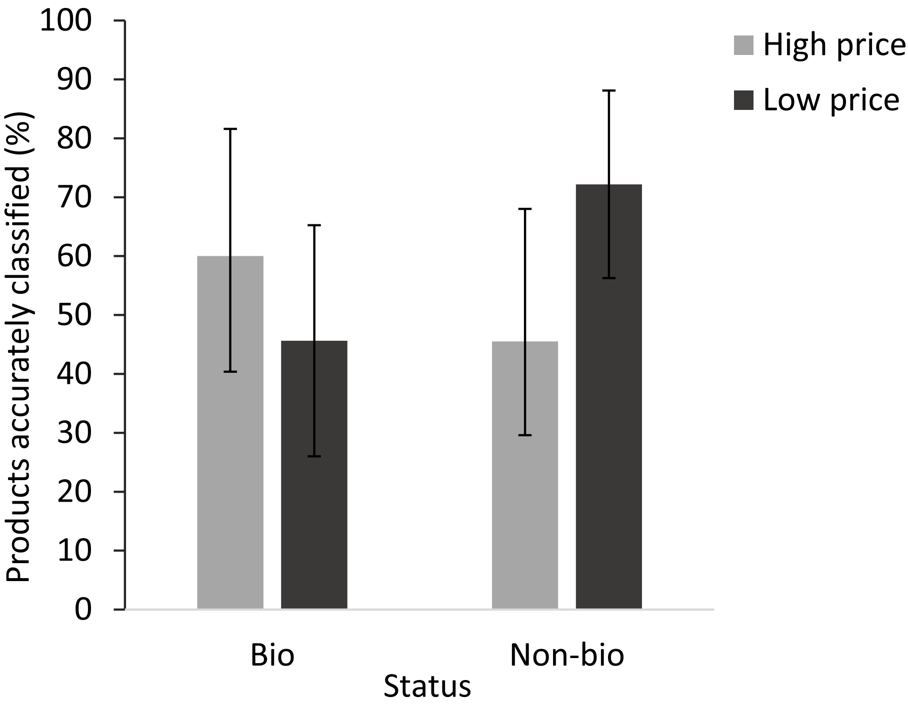

Fig. 3 Means in percentage of accurately classified products depending on status and price of the product. Error bars represent the standard deviation of means

Classification Confidence

We found no significant correlation between overall classification confidence and overall classification accuracy, indicating that judges who felt confident in their classification decision were not better in classifying products as bio or non-bio correctly, $r(118) = -0.07$, $p = 0.463$.

To test our *colour-price-fit-confidence-hypothesis*, a 2×2×2 ANOVA for repeated measurements with the independent variables status of the product, colour of the product, and price of the product and the dependent variable classification confidence (in percentage) was run. In line with our assumption, a significant interaction for manipulation of colour of the product with manipulation of price of the product on classification confidence emerged, $F(1, 119) = 25.51$, $p < 0.001$, $\eta p^2 = 0.18$. As expected, classification confidence was significantly higher for products with non-bio-typical colours and low prices ($M = 62.26\%$, $SD = 19.35\%$), 95% CI [58.76, 65.75] than for products with non-bio-typical colours and high prices ($M = 56.64\%$, $SD = 19.71\%$), 95% CI [53.08, 60.20], $d_{RM,\ pool} = 0.92$ (see also Table 1). Contrary to our assumptions, for products with bio-typical colours and high prices, classification confidence was not significantly higher (M = 59.16%, SD = 18.77%), 95% CI [55.77, 62.55] than classification confidence for products with bio-typical colours and low prices ($M = 58.79\%$, $SD = 18.31\%$), 95% CI [55.48, 62.10], $d_{RM,\ pool} = 0.07$ (see also Fig. 4).

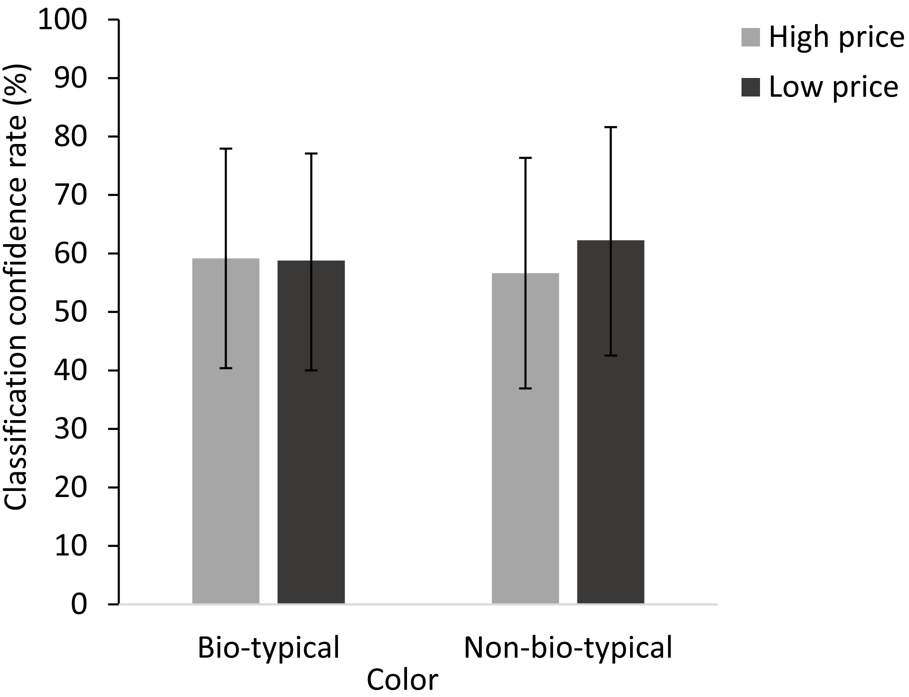

Fig. 4 Means in percentage of classification confidence for bio and non-bio long sleeves depending on colour and price of the product. Error bars represent the standard deviation of means

Unexpectedly, a significant main effect for manipulation of status of the product on classification confidence was found, $F(1, 119) = 26.76$, $p < 0.001$, $\eta p^2 = 0.18$. Classification confidence was significantly higher for actual non-bio products ($M = 60.68\%$, $SD = 18.07\%$), 95% CI [57.41, 63.95] than for actual bio products ($M = 57.75\%$, $SD = 18.40\%$), 95% CI [54.42, 61.07], $d_{RM,\ pool} = 1.38$. Moreover, results yielded a significant main effect for manipulation of price of the product, $F(1, 119) = 12.96$, $p < 0.001$, $\eta p^2 = 0.10$, indicating significantly higher classification confidence for low prices ($M = 60.52\%$, $SD = 18.19\%$), 95% CI [57.24, 63.81] than for high prices ($M = 57.90\%$, $SD = 18.63\%$), 95% CI [54.53, 61.27], $d_{RM,\ pool} = 0.79$. Unexpectedly, a significant interaction for manipulation of status of the product and manipulation of price of the product on classification confidence emerged, $F(1, 119) = 24.18$, $p < 0.001$, $\eta p^2 = 0.17$. Classification confidence was significantly lower for actual non-bio products with high prices, ($M = 58.02\%$, $SD = 19.18\%$), 95% CI [54.55, 61.48] than for actual non-bio products with low prices ($M = 63.34\%$, $SD = 18.88\%$), 95% CI [60.00, 66.68], $d_{RM,\ pool} = -0.89$. For classification of actual bio products with high prices, classification confidence ($M = 57.78\%$, $SD = 18.98\%$), 95% CI [54.35, 61.21] did not significantly differ from classification of actual bio products with low prices ($M = 57.71\%$, $SD = 19.00\%$), 95% CI [54.28, 61.15], $d_{RM,\ pool} = 0.02$. As expected, there was no significant main effect for manipulation of colour of the product on classification confidence, $F(1, 119) = 0.51$, $p = 0.478$, $\eta p^2 = 0.00$, $d_{RM,\ pool} = -0.16$. Furthermore, manipulation of status of the product and manipulation of colour of the product did not interact significantly, $F(1, 119) = 3.46$, $p = 0.056$, $\eta p^2 = 0.03$. No significant three-way interaction was found, $F(1, 119) = 3.50$, $p = 0.064$, $\eta p^2 = 0.03$.

Experience and Classification Accuracy

In this Study, experience was measured with the GEB scale (Cronbach's $\alpha = 0.74$; $M = 3.95$, $SD = 0.41$). Following Kaiser and Wilson (2004) and Arnold et al. (2018), who developed and validated the scale, for data-analysis, item responses were recoded into a dichotomous format whereas *never*, *seldom*, and *occasionally* were combined as indicators of noncompliance with environmental protection. *Often* and *always* were combined to indicate compliance with environmental protection, resulting in $M = 69.59\%$ ($SD = 13.93\%$). Against our *experience-accuracy-hypothesis*, GEB rates and overall classification accuracy did not correlate significantly, $r(118) = 0.11$, $p = 0.239$. In detail, no significant correlation between GEB rates and detecting actual non-bio products was found, $r(118) = 0.15$, $p = 0.113$. Also, no significant correlation between GEB rates and identifying actual bio products, $r(118) = -0.03$, $p = 0.773$ emerged. So, participants got deceived by executional greenwashing independent from their self-ratings in general ecological behaviour.

Discussion

Overall, participants were skeptical about if a product was actually a bio product and categorized more products as non-bio than as bio, showing a small judgmental bias for "non-bio" in our detection task. Most importantly, participants used the cues colour and price of the product for their classification judgments as expected in the *colour-bias-hypothesis* and the *price-bias-hypothesis.* In detail, judges classified with higher probability bio-typical coloured and high priced products as bio compared to non-bio-typical coloured and low priced products. While the effect size of the colour of the product on the judgmental bias was medium, we found a strong effect of the price of the product on the judgmental bias.

Overall classification accuracy showed participants were significantly better than chance in deception detection (55.83%), with a medium effect size. Classification of non-bio products was more accurate than classification of bio products, in line with the judgmental bias (for "non-bio") – thus, classifying accurately as non-bio compared to bio was more probable. Furthermore, the *colour-fit-accuracy-hypothesis* and the *price-fit-accuracy-hypothesis* were confirmed with medium effect sizes. We found higher ability to classify a product correctly as bio or non-bio when the fit of the colour of the product and the price of the product to the stereotypical mental category of bio and non-bio matched the actual status of the product (bio/non-bio). In line with our assumptions, for example, an actual bio product with a bio-typical colour and a high price was classified more accurately than an actual bio product with a non-bio-typical colour and a low price. So, consumers were influenced by the bio-typicality of the colour and the level of the price of the product in their classification judgments which further lead to higher classification accuracy when these fitted to the actual status of the product (and lower by misfit). Concluding, consumers used the colour and the price of the product for their classification judgment of products what leaded to a differential classification accuracy.

Results regarding our *colour-price-fit-confidence-hypothesis* emerged a large effect size for higher classification confidence when colour and price of the product fitted both the stereotype of the category non-bio compared to only colour (non-bio-typical) fitted to category-stereotype, but not price (high). If the products had a bio-typical colour, no significant difference between combinations with a high or low price was found. A main effect for product price offered significantly higher classification confidence for low prices.

Furthermore, results did not confirm our *experience-accuracy-hypothesis*. No correlation between GEB and classification accuracy was found. This indicates that consumers' highly experienced in general ecological behaviour were not better than such low experienced consumers in classification accuracy and so also got greenwashed. According to our not confirmed *experience-accuracy-hypothesis*, limitations of the GEB scale are discussed. At first, the GEB scale tries to control influences of incidental ecological behaviour with the answering option of "no answer" when an item does not fit to a life situation. For example, in the authors' opinion, someone without a driver's license could not give an answer about driving style. But, "[…] someone who usually behaves very unecologically may, for whatever reason, not drive an automobile, a behavior that is commonly difficult *not* to carry out" (Kaiser et al., 1999, pp. 6–7). In this case, inferentially, behaviour that implies avoiding car use is environmentally friendly – independent from whether someone holds a driver's license. "No answer" in this case does not measure the real behaviour, rather an influence of intention as one requirement for behaviour. Intentions and real behaviour are not the same and often not connected (e.g., Norberg et al., 2007).

Furthermore, the chosen product colours did not totally fit to the expected categories of bio-typical and non-bio-typical. For example, blue was categorized comparable to black (bio-typical), although we assumed it would be perceived as non-bio-typical. As a last criticism at this point, presented bio products were "only bio." A problem of bio fashion, as used in this Study, is that it does not automatically implicate to fulfil ecological or fairness standards. Some products can be ecological in one aspect while failing to meet ecological standards in other aspects (Tang et al., 2004).

In further research, it is thinkable to choose ecological products under stronger criteria, not only produced with biomaterial, but rather fulfilling ecologically sustainable standards stronger. Next, the categorization of blue as bio-typical or non-bio-typical colour should be examined again. Also, an investigation with other products, for example, accessories, is advisable, when researching in a fashion context. A next aspect should be a more detailed measurement of ecological orientated behaviour experience including the specific context and situation (e.g., Blair et al., 2010; Reinhard et al., 2013b). This perspective is in line with assumptions of context influences as an important impact on behaviour by the theory of planned behaviour (Ajzen, 1991, 2002): "[…] who tends to behave ecologically on a very high level across different behaviors, may fail to recycle newspapers, even though this behavior is easy to carry out" (Kaiser et al., 1999).

To replicate our hypotheses with different stimulus material (other fashion items), a second study was conducted. In Study 2, we varied the colour of two different fashion product types (T-shirts and backpacks), again using actual bio and actual non-bio products (now under stronger criteria) and asking participants to classify the actual status of the products. In Study 2, we tested the *colour-bias-hypothesis*, the *colour-fit-accuracy-hypothesis*, and the *experience-accuracy-hypothesis*. These hypotheses were expected independent from the type of the product.

Study 2

Method

Participants

A total of 304 subjects were recruited online via social media and started to participate, whereas 274 stated to be female. Parallel to Study 1, again only women were analyzed (Hansen & Møller Jensen, 2009; Lee, 2009; Pentecost & Andrews, 2010; Stuart, 2019). Of these 274 females, data of 32 more participants were excluded because they stated to be under 18 years old. Three more participants dropped out because of data use rejection, and 36 more because of not completing the classification task. The final sample analyzed in Study 2 included $N = 203$ female Germans with a mean age of 27.31 years (between 18 and 60 years, $SD = 9.05$; 40.39% with university degrees, 35.96% university students, 4.43% students in school, 3.45% in apprenticeship, 13.30% finished apprenticeship, and 2.46% had just school degrees). 7.39% were without an own income, 5.42% had less than 250€, 14.29% between 250€ and 500€, 26.60% 500–1000€, 12.81% 1000–1500€, 12.32% 1500–2000€, 11.82% 2000–2500€, and 9.35% 2500€ or more income per month. Participants were recruited for a study on "Eco fashion." The Study lasted approximately 10–15 min. No incentive was offered for participation.

Post hoc power analysis (G*Power; Faul et al., 2007) for repeated measures, within factors ANOVA with $\alpha = 0.05$, correlation among repeated measurements $r(201) = 0.573$, and the lowest effect size found in Study 2 $f = 0.67$ (see results *colour-bias-hypothesis*, $\eta p^2 = 0.31$) for eight groups and two measurements with 203 participants yielded an actual power of 1.

Design and Conditions

Study 2 was conducted online with a 2 (status of the product: bio vs. non-bio) [3] $\times$ 2 (colour of the product: bio-typical vs. non-bio-typical) $\times$ 2 (type of the product: T-shirt vs. backpack) within-subjects design (see also Appendix A, Table A.2). Type of the product was included as a stimulus replication factor.

Stimulus Material

Parallel to Study 1, 32 products were selected from real online shops. One-half of the T-shirts and one-half of the backpacks were ecologically sustainable (certified, ecologically sustainable, and fair production) and the other half not. We chose products with bio-typical colours and non-bio-typical colours. For the bio-typical colour condition, chosen products were in the colour range brown/green/grey/mint, associated with concepts related to nature (Clarke & Costall, 2008; Lichtenfeld et al., 2012). Blue, orange, pink, and yellow products were chosen as non-bio-typical coloured ones, due to being assumed as artificial, bright, and non-natural looking. For each colour, we picked two T-shirts and two backpacks, one actual bio and one actual non-bio. Only products in a constant price segment (T-shirts approx. 20€; backpacks approx. 100€) were selected. We chose T-shirts with comparable

[3] In Study 2: "bio" equivalent to "ecologically sustainable".

cut designs and backpacks in a rectangular format, and digitally removed the labels. The photographed position of the T-shirts and the backgrounds (white) of all products were standardized. Each backpack was presented from the front and in a standing position while some photos pictured the backpacks lightly tilted to the left and others lightly tilted to the right (see also Appendix A, Table A.2).

Procedure

Up to the classification task instructions, the procedure was parallel to Study 1. Here, the informational text included the term "ecologically sustainable." The task instruction was to detect the mislabelling of 16 female T-shirts and 16 backpacks that all were declared as ecologically sustainable. Again, feedback of correctly classified products followed (see Appendix B.2). We presented all 16 female T-shirts in randomized order and then all 16 backpacks in randomized order. Parallel to Study 1, participants judged the products, here, if they were "sustainably produced" or "not sustainably produced," and rated the confidence of their classification decision[4]. Questions about the applied German political party and political orientation, same as in Study 1, followed.

Now, differing to Study 1, we used four scales for our experience measurement, focusing on an ecologically sustainable fashion market context. Answers were given on a 6-point Likert scale (1 = *do not agree at all* and 6 = *agree completely*). The first scale by Shrum et al. (1995) measured *green purchase behaviour* (*GPB*) with four items, each containing one statement (e.g., "When I have a choice between two equal products, I purchase the one less harmful to the environment."). The second scale was based on Niinimäki (2010) and subsequently modified to a more manageable scale by Geiger and Keller (2018), measuring *fashion purchase criteria* (*FPC*) with six statements. All statements began with the words "When shopping for clothes, I pay attention to… (e.g., '…the working conditions under which they have been produced.')." The third scale measured participants' subjective knowledge about ecologically sustainable T-shirts and backpacks (*SKS*). This scale by Flynn and Goldsmith (1999) contained five items and can be applied to any area of knowledge. For example, one item was called "Among my circle of friends, I'm one of the experts on ecologically sustainable T-Shirts" (for backpacks: "Among my circle of friends, I'm one of the experts on ecologically sustainable backpacks."). The fourth scale referred to *fashion purchase behaviour* (*FPB*) (Koszewska, 2013). Each of its five items contained two poles with one statement each. Between the two poles, there were six gradations with a possibility to estimate to what extent one agreed with one or the other pole. For example, "I never check for the producer country" (1), and the opposite pole, "I always check for the producer country" (6).

Then, parallel to Study 1, the attention check and the manipulation check followed. In the manipulation check here, the colour classification question was about blue, brown, green, orange, pink, red, and yellow. Red was added due to the backpacks being reddish pink and the T-shirts rose pink. Finally, the same two open questions as in Study 1 followed, et cetera.

[4] Given that for classification confidence in Study 2 no Hypothesis was proposed, these results can be found in Appendix G.

Results

Classification of colours

As assumed, the colours pink (94.39%), red (48.47%), and orange (49.49%) were categorized as not ecologically sustainable. Further in line with our assumptions, brown (5.10%) and green (4.08%) were categorized less as not ecologically sustainable. Unexpectedly, blue (23.47%) and yellow (19.90%) were for most of the participants not perceived as not ecologically sustainable.

Judgmental Bias

Overall, participants judged 44.94% ($SD = 16.55\%$) of the products as ecologically sustainable. This value was significantly different from chance level (50%), $t(202) = -5.13$, $p < 0.001$, 95% CI [41.75, 46.33], $d_{Cohen} = -0.31$, indicating a bias for "not ecologically sustainable." This judgmental bias was found for T-shirts ($M = 43.90\%$, $SD = 19.55\%$; difference from chance level, $t(202) = -4.44$, $p < 0.001$ [43.99, 46.61], $d_{Cohen} = -0.31$) and for backpacks ($M = 44.18\%$, $SD = 18.38\%$; $t(202) = -4.51$, $p < 0.001$ [41.64, 46.72], $d_{Cohen} = -0.31$).

In line with our *colour-bias-hypothesis*, a 2×2 ANOVA for repeated measurements with the independent variables type of the product (T-shirt vs. backpack), and colour of the product (bio-typical vs. non-bio-typical), and the dependent variable judgmental bias yielded a significant main effect for manipulation of colour of the product, $F(1, 202) = 91.08$, $p < 0.001$, $\eta p^2 = 0.31$. Products with bio-typical colours were significantly more often classified as ecologically sustainable ($M = 49.85\%$, $SD = 19.68\%$), 95% CI [47.12, 52.57] than products with non-bio-typical colours ($M = 38.24\%$, $SD = 17.63\%$), 95% CI [35.80, 40.68], $d_{RM,\ pool} = 0.73$. As expected, there was no significant main effect for manipulation of type of the product (T-shirt vs. backpack) on judgmental bias, $F(1, 202) = 3.38$, $p = 0.067$, $\eta p^2 = 0.01$, $d_{RM,\ pool} = 0.02$. Moreover and also as assumed, no significant interaction between manipulation of type of the product and manipulation of colour of the product was found, $F(1, 202) = 0.34$, $p = 0.559$, $\eta p^2 = 0.00$ (see also Fig. 5).

Classification Accuracy

Overall classification accuracy across both types of the products ($M = 51.15\%$, $SD = 8.78\%$) was not significantly different from chance level (50%), $t(202) = 1.87$, $p = 0.062$, 95% CI [49.94, 52.37], $d_{Cohen} = 0.13$. In detail, classification accuracy for T-shirts ($M = 49.14\%$, $SD = 11.42$) was not significantly different from chance level, $t(202) = -1.08$, $p = 0.283$, 95% CI [47.56, 50.72], $d_{Cohen} = -0.08$. In contrast, classification accuracy for backpacks ($M = 53.17\%$, $SD = 11.08\%$) was significantly different from chance level, $t(202) = 4.08$, $p < 0.001$, 95% CI [51.64, 54.70], $d_{Cohen} = 0.29$.

A 2×2×2 ANOVA for repeated measurements with the independent variables type of the product (T-shirt vs. backpack), status of the product (bio vs. non-bio), colour of the product (bio-typical vs. non-bio-typical), and the dependent variable classification accuracy (in percentage) was run. According to our *colour-fit-accuracy-hypothesis*, there was a significant interaction between manipulation of status of the product and manipulation of colour of the product on classification accuracy, $F(1, 202) = 91.08$, $p < 0.001$, $\eta p^2 = 0.31$.

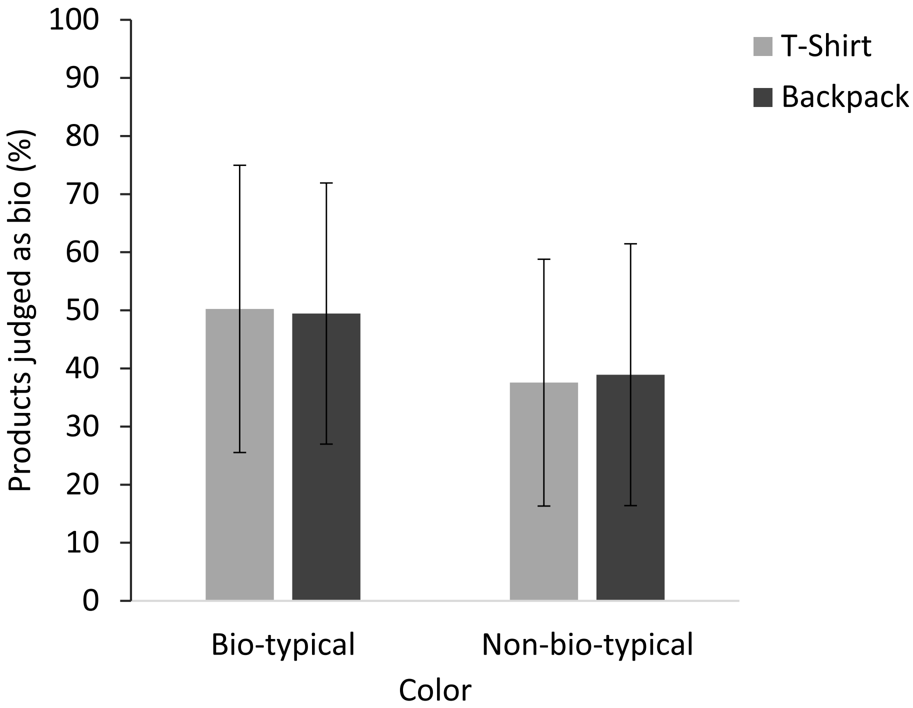

Fig. 5 Means in percentage of products judged as bio depending on colour and type of the product. Error bars represent standard deviation of means

Significantly higher classification accuracy was found for actual bio products with bio-typical colours ($M = 51.05\%$, $SD = 23.98\%$), 95% CI [47.73, 54.37] than for actual bio products with non-bio-typical colours ($M = 39.35\%$, $SD = 20.05\%$), 95% CI [36.57, 42.12], $d_{RM,\ pool} = 0.46$ (see also Table 2). Also, as assumed, we found significantly lower classification accuracy for actual non-bio products with bio-typical colours ($M = 51.35\%$, $SD = 23.06\%$), 95% CI [48.16, 54.55] than for actual non-bio products with non-bio-typical colours ($M = 62.87\%$, $SD = 22.18\%$), 95% CI [59.80, 65.94], $d_{RM,\ pool} = -0.41$ (see also Fig. 6).

In line with the judgmental bias (for "non-bio"), we found a significant main effect for manipulation of status of the product on classification accuracy, $F(1,\ 202) = 26.30$, $p < 0.001$, $\eta p^2 = 0.12$. Participants classified actual non-bio products significantly more accurately ($M = 57.11\%$, $SD = 18.82\%$), 95% CI [54.51, 59.72] than actual bio products ($M = 45.20\%$, $SD = 18.65\%$), 95% CI [42.62, 47.78], $d_{RM,\ pool} = 0.20$. Moreover, an unexpected significant main effect for manipulation of type of the product on classification accuracy emerged, $F(1,\ 202) = 16.67$, $p < 0.001$, $\eta p^2 = 0.08$. Backpacks were classified significantly more accurately ($M = 53.17\%$, $SD = 11.08\%$), 95% CI [51.64, 54.70] than T-shirts ($M = 49.14\%$, $SD = 11.42\%$), 95% CI [47.56, 50.72], $d_{RM,\ pool} = 0.23$. Unexpectedly, we found a significant interaction between manipulation of type of the product and manipulation of colour of the product on classification accuracy, $F(1,\ 202) = 10.51$, $p = 0.001$, $\eta p^2 = 0.05$. Backpacks in bio-typical colours were classified significantly more accurately ($M = 54.99\%$, $SD = 16.52\%$), 95% CI [52.70, 57.27] than T-shirts in bio-typical colours ($M = 47.41\%$, $SD = 17.53\%$), 95% CI [44.99, 49.84], $d_{RM,\ pool} = 0.26$. If the products

Table 2 Classification accuracy and classification confidence for classified T-shirts and backpacks depending on type, status, and colour of the product

	Type							
	T-shirt				Backpack			
	Status							
	Bio		Non-bio		Bio		Non-bio	
	Color							
	Bio-typical	Non-bio-typical	Bio-typical	Non-bio-typical	Bio-typical	Non-bio-typical	Bio-typical	Non-bio-typical
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Classification accuracy	47.66% (30.53%)	38.42% (25.64%)	47.17% (30.08%)	63.30% (26.71%)	54.43% (28.12%)	40.27% (26.11%)	55.54% (27.65%)	62.44% (28.19%)
Classification confidence	52.55% (20.39%)	52.44% (20.43%)	52.18% (20.34%)	52.88% (21.09%)	53.47% (20.98%)	55.47% (20.00%)	54.13% (20.35%)	53.62% (19.82%)

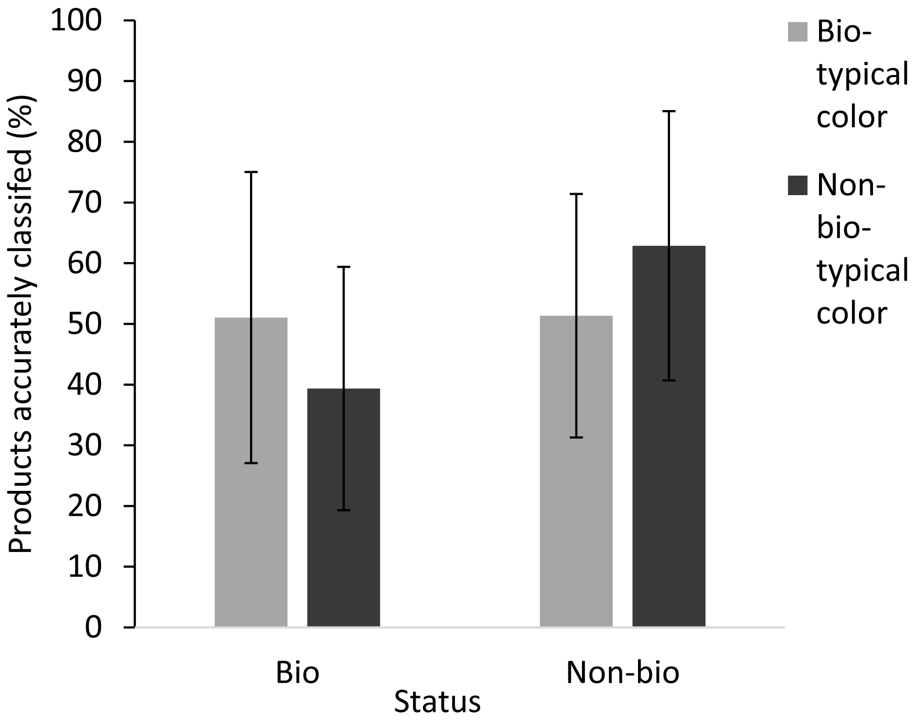

Fig. 6 Means in percentage of accurately classified products depending on status and colour of the product. Error bars represent standard deviation of means

had non-bio-typical colours, classification accuracy for backpacks was not significantly different ($M = 51.36\%$, $SD = 15.17\%$), 95% CI [49.26, 53.45] to T-shirts ($M = 50.86\%$, $SD = 15.31\%$), 95% CI [48.74, 52.98], $d_{RM, pool} = 0.02$.

As expected, no significant main effect for manipulation of colour of the product on classification accuracy was found, $F(1, 202) = 0.01$, $p = 0.939$, $\eta p^2 = 0.00$, $d_{RM, pool} = 0.00$. In line with our assumptions, no significant interaction between manipulation of type of the product and manipulation of status of the product emerged, $F(1, 202) = 0.05$, $p = 0.832$, $\eta p^2 = 0.00$. Finally and matching our assumptions, the analysis yielded no significant three-way interaction, $F(1, 202) = 0.71$, $p = 0.402$, $\eta p^2 = 0.00$.

Experience and Classification Accuracy

In Study 2, we used four scales for the experience measurement. All four scales showed at least acceptable reliabilities (Cronbach's alphas of GPB: $\alpha = 0.78$, FPC: $\alpha = 0.88$, SKS with T-shirts: $\alpha = 0.85$, SKS with backpacks: $\alpha = 0.84$, and FPB: $\alpha = 0.87$). Against our *experience-accuracy-hypothesis*, analysis yielded no significant correlations between classification accuracy and rates of experience measuring scales (see Table 3). For supplementary analysis, we created a difference score between judgments as bio for bio-typical coloured T-shirt minus non-bio-typical coloured T-shirts (*difference score T-shirt*) and further a difference score for bio-typical coloured backpacks minus non-bio-typical coloured backpacks (*difference score backpack*). No significant[5] correlations of difference score T-shirt with the experience measuring scales emerged [GPB: $r(200) = 0.17$, $p = 0.015$; FPC: $r(199) = 0.06$, $p = 0.371$; SKS with T-Shirts: $r(199) = -0.08$, $p = 0.288$; SKS with backpacks: $r(195) = -0.02$, $p = 0.813$; FPB: $r(195) = 0.07$, $p = 0.357$]. Moreover, no significant correlations of difference score backpack with the experience measures were found [GPB: $r(200) = -0.05$, $p = 0.451$; FPC: $r(199) = 0.06$, $p = 0.438$; SKS with T-Shirts: $r(199) = 0.12$, $p = 0.092$; SKS with backpacks: $r(195) = 0.07$, $p = 0.311$; FPB: $r(195) = -0.08$, $p = 0.267$].

Discussion

Overall, in our detection task of Study 2, we found a small judgmental bias for "non-bio," indicating that participants were skeptical about if a product was an actual bio product. In line with our *colour-bias-hypothesis*, participants used the cue colour of the product for classification judgments (T-shirts and backpacks). For products with a bio-typical colour, the probability to classify it as a bio product was higher compared to for products with a non-bio-typical colour, with a moderate effect size.

Overall classification accuracy (51.15%) did not differ from chance level. According to our *colour-fit-accuracy-hypothesis*, classification accuracy depended on the fit between the actual status and the bio typicality of the colour of the product with a small effect size. So, for example, an actual bio product with a bio-typical colour was classified more accurately than an actual bio product with a non-bio-typical colour. Concluding, in Study 2, we again found that the bio-typicality of the colour of the product plays a crucial role in judgments about if a product is bio or non-bio, also with differing product types of the fashion market. Therefore, it leads to higher classification accuracy when the bio-typicality (yes/no) of the colour of the product fits to the actual status of the product (bio/non-bio) and lower classification accuracy by a misfit of actual product status and product colour.

Against our *experience-accuracy-hypothesis*, even with ecologically sustainable fashion market context knowledge measurement, no correlation between experience and classification accuracy was found. So, differently with varying ecological contexts, experienced consumers got greenwashed by the colour of the product.

General Discussion

In the presented two studies, the influence of the visual executional greenwashing product cues colour (Studies 1 and 2) and price (Study 1) on actual deception detection behaviour was investigated. Based on category inference mechanisms we hypothesized, the higher the fit between the cues and the mental representation of the corresponding category prototype, the higher the probability of a classification into the category, so, by no match to the *actual* status, the higher the probability of getting deceived (lower classification accuracy). We further assumed higher confidence in classification decision when both cues fitted to that category (Study 1). Beyond, we hypothesized less deception for experienced consumers.

Participants judged the products as bio or non-bio depending on the bio-typicality of the products' colours and price levels (high price is more likely judged as bio). In line with

[5] Because of multiple testing, the niveau of statistical significance was adjusted to the significance level of $\leq .005$.

Table 3 Decreptive statistics for and correlations between the classification accuracy for T-Shirts and backpacks and the experience measurements

Variable	1	2	3	4	5	6	7	8	9	n	M	SD
1. Overall accuracy T-Shirts and backpacks (%)										203	51.15	8.78
2. Accuracy bio-typical colored T-Shirts (%)	.58*									203	47.41	17.53
3. Accuracy non-bio-typical colored T-Shirts (%)	.52*	-.04								203	50.86	15.31
4. Accuracy bio-typical colored backpacks in (%)	.56*	.15[x]	.05							203	54.99	16.52
5. Accuracy non-bio-typical colored backpacks (%)	.52*	.05	.17*	−.02						203	51.35	15.17
6. GPB	−.04	−.01	.00	.11	−.21[x]					202	4.59	0.99
7. FPC	.08	.07	.09	.06	−.06	.51*				201	3.44	1.24
8. SKS T-Shirts	−.17[x]	−.05	−.10	−.16[x]	−.06	−.12	−.09			201	2.64	1.09
9. SKS backpacks	−.21[x]	−.01	−.10	−.24[x]	−.11	−.90	−.06	.43*		197	2.55	1.12
10. FPB	.11	.03	.13	.11	−.04	.62*	.81*	−.13	−.09	197	3.57	1.14

* Niveau of statistical significance was adjusted because of multiple testings to the significance level of $\leq .001$

[x] unadjusted significance level $< .05$

previous research, the results of our manipulation checks offered that the colours green and brown were rated as most typical bio and pink as less typical bio (e.g., Lim et al., 2020; Seo & Scammon, 2017; Sundar & Kellaris, 2017). So, in terms of our hypotheses, the fitting of visual cue and mental representation of the stereotype of the category “bio” (/”non-bio”) was crucial for the classification-decision as bio (/non-bio), what accompanies with results of research on inference mechanisms (Murphy & Ross, 1994; Noseworthy et al., 2012; Stayman et al., 1992; Sujan & Bettman, 1989). Therefore, among the previously known greenwashing influences of packaging and advertisements (de Freitas Netto et al., 2020; Krafft & Saito, 2014; Lim et al., 2020; Matthes et al., 2014; Parguel, et al., 2015; Seo, 2010; Seo & Scammon, 2017; Xue & Muralidharan, 2015), also the compositions colour and price of the product itself can “successfully” greenwash consumers. Overall, we observed a judgmental bias for “non-bio,” in line with results about skepticism regarding “green” products (Chen & Chang, 2013; Do Paço & Reis, 2012; Sijtsema et al., 2016; Zinkhan & Carlson, 1995).

Overall classification accuracy levels across both studies were in line with results in the field of lie detection (range of 45 to 60%), indicating a general low ability to detect deception (Aamodt & Custer, 2006; Bond & DePaulo, 2006; Ekman & O’Sullivan, 1991; Reinhard et al., 2013a; Vrij, 2008). We found that the classification accuracy was increased when the fit of the visual product cue (bio-typical/non-bio-typical colour; high/low price) to the stereotypical status of the product (bio/non-bio) matched the actual status of the product (bio/non-bio). Without this match, consumers got deceived (lower classification accuracy). Half-way confirming our *colour-price-fit-confidence-hypothesis*, it was shown that especially confident with their (failed) classification decision were consumers regarding non-bio-typical coloured and low priced products. Unexpectedly, there also was a main effect for price of the product on classification confidence, indicating a low price as enhancing the confidence. As mentioned before, bio-fashion indeed often comes in a premium price segment (Brito et al., 2008; Roberts, 1996). Nevertheless, mainly responsible for a heightened classification confidence was the *combination* of a non-bio-typical-colour and a low price, accompanying with the sensory sampling model by Juslin and Olsson (1997).

As declared in the theoretical background, regarding the correlation between expertise and lie detection, previous research offered mixed results (Aamodt & Custer, 2006; Gegenfurtner et al., 2011; Mann et al., 2007; Parguel et al., 2015; Reinhard et al., 2013a; Schmuck et al., 2018a, b). What can be concluded by our results is that consumers with self-rated high experience in general ecological behaviour as well as in sustainable fashion market contexts were not more accurate in classifying the products than such low experienced consumers. Based on the Studie’s introduction and instruction toward the respondents, even with the suspicion of greenwashing, experienced consumers were not able to detect the fraud. On the actual B2C sales market, someone could imagine that especially these consumers that are environmentally friendly orientated are the main group of consumers that get greenwashed. In their buying behaviour, they are confronted with the greenwashing strategies mostly and, as shown by our results, not able to detect the greenwashing by superficial cues. Underlining this argument, recent results showed that especially ethically sensitive consumers got greenwashed in their ethicality judgments regarding a described ethically ambiguous retailing practice (pretested) by the “eco-friendliness” of the retailer’s brand logo colour (simultaneously presented) (Sundar & Kellaris, 2017). So, consumer-based efforts to counteract the climate change are not enough; they rather seem to enable “successful” deceiving strategies what makes political regulations necessary.

Our results were found for different fashion products under varying manipulation of the bio-typicality of the colours of the products (Study 1: clear difference between bio-typical colours, Study 2: colour range of bio-typical colours). Altogether, the current two studies verify the issue of executional greenwashing, showing “successful” deception by the colour (and price) of the product, and further help to understand how people fall for it.

Limitations

Against our assumptions, the colours blue (Studies 1 and 2) and yellow (Study 2) were apparently perceived as typical bio. Nevertheless, our hypothesized effects were shown. With a better fit of the colours of the products to the categories bio versus non-bio, one could expect even stronger effects. Furthermore, our detection task did not represent a real online shopping situation in a total. Due to the fact that consumers can take a deeper look on and touch the products after they got delivered, they then have more available criteria for deciding if a product actually fits bio standards or if it rather is fast fashion. Fast fashion is characterized by speed, trendiness, and low prices (Carey & Cervellon, 2014; Sheridan et al., 2006; Watson & Yan, 2013). In detail, this definition does not exclude the fact of biomaterials. It “[…] seems to be a foggy understanding of what is ‘eco-fashion’ as a variety of terms have been used such as ethical, organic, green, fairtrade, sustainable, recycled, re-used, eco etc.” (Cervellon et al., 2010); notably, definitions of these key terms differ (e.g., Oxford Dictionaries, n.d., Ecofriendly Fashion, 2017) – they are not less complex, and consumers often are uncertain about their meanings (Brécard, 2017; Sijtsema et al., 2016). Typically, sustainability is defined across three pillars: an ecological one, an economic one, and a social one (United Nations, 2005, p. 12). It is difficult to fit these standards and even more to recognize if a product fits them. For example, while it is true that fashion produced from 100% bio textiles (Study 1) involves lower CO_2 emissions in its whole life cycle (especially focused on longevity and disposal), it does not automatically implicate for instance being socially fair produced. Furthermore, bio textiles come with land use and also cause water and energy costs (European Environment Agency, 2022).

The fact that there is confusion about the involved terms encourages successful greenwashing. It is not surprising that consumers search for cues that can direct these decisions, especially in an affected situation with low processing intensity (Isen & Shalker, 1982; Sanbonmatsu & Fazio, 1990; Schwarz & Bless, 1992). In online shopping situations, pictures of the products, but no haptic factors, are available as criteria for the classification decision. Based on our classification strategy analysis, the look of the material of the products seems to be used for the classification decision. While we focused our analysis on the influence of the product colour and the product price, online shops often state written information about the product material. It is thinkable that with more available product information, experience could be more beneficial for classification accuracy. At this point, we have to highlight that our experience measurements were self-ratings. Corral-Verdugo (1997) concluded that self-reports of ecological behaviour cannot be trusted as proxies for objective behaviour. In contrast, Gamba and Oskamp (1994) determined self-report measures as reasonable, accurate indicators of people’s ecological performances in recycling behaviour.

All in all, our results allow to conclude that for the first judgmental decision in an online shop where most of the time only pictures and the price information are directly presented, consumers are not able to detect greenwashing deception.

Implications

The features colour and price of the product can be instrumentalized in design to communicate ecological products on consumer markets more successfully by enabling fluent categorization inferences (Crilly et al., 2004). Beyond, apparently an *analytical buying* by consumers which implicates evaluating the pros and cons of a product related to its ecological consequences seems advisable for greenwashing detection (Stephens, 1985, p. 60). The online shopping experience might limit this analytical buying strategy due to only presenting the clothes by pictures and videos. A possibility for differentiated decision criteria in online shops could be virtual product perception that enables "[…] to view products from various angles and distances; functional control enables consumers to explore and experience different features and functions of products" (Jiang & Benbasbat, 2005). This could lead to a more realistic estimation of if the product fits the buyers' needs and expectations, what further would minimize the probability that a product would be returned to the seller and so also minimize additional CO_2 emissions by the transport and logistics (Edwards et al., 2010; Frei et al., 2020).

Fortunately, when consumers indeed perceive greenwashing, they negatively judge the brand of the greenwashed products and further are less interested to buy products from that brand (Akturan, 2018; Lee et al., 2018; Newell et al., 1998; Roozen & Raedts, 2020). A public awareness of the existence, causes, and impact of climate change fortunately exists (Eichhorn et al., 2020). Nevertheless, our results underline that (also specifically contextual experienced) consumers fall for greenwashing (just by the superficial cues colour and price of the product and even with a medium motivation to detect deception) which highlights that political regulations are essential. To enable greenwashing detection, clear informational details about a product and its attributes is required; research by Yan et al. (2012) showed that explicit information of environmentally friendly fashion in their marketing claims can enhance consumers' positive attitudes regarding the brand, what further predicted the intention to buy from this brand. Therefore, apparel companies that sell indeed environmentally friendly products can profit from making their strategies transparent.

So, a political regulated consistent design of the market communication of a product with all-encompassing information about lack of toxins, production process, and CO2 emission balance is inevitable (Scammon & Mayer, 1993; Harbaugh et al., 2011). Parguel et al. (2015) showed that greenwashing by advertising executional elements can be decreased with the use of a traffic light type of eco-label. Nevertheless, the impact of eco-labels is influenced multiply, for example, by the knowledge about a label's statement or the trust in a label (Thøgersen, 2000). To counteract this, political regulations to strongly prohibit the use of greenwashing evoking elements are necessary. Examples are the illustration of nature (e.g., plants), natural colours (especially green), putative "eco"-labels, words/terms connected to associations with environmental friendliness like "natural" and "biological" et cetera.

Besides, a higher price of "green" fashion seems to be a main factor why people decide to not purchase (e.g., Chan & Wong, 2012; Eze & Ndubisi, 2013). Detailed information about the self-reported willingness to purchase in a "green" product gives data from Miremadi et al. (2012). With an additional 5% in the pricing of a "green" product (including cars, building materials, electronics, furniture), 70% of the surveyed buyers answered being d'accord if it meets the same performance standards as the alternative "non-green" product. But, with an additional pricing of 25%, only 10% of the consumers would chose the "green" product.

To sum up, at first, clearness about what guarantees products actually being as much as possible environmentally sustainable regarding the three pillars of sustainability is needed, with focus on the whole product life cycle (Spragg, 2017). Second, all including information to fulfil this has to be communicated to the consumers within a uniform, understandable format by the whole product marketing, including the advertisements, the packaging, and the product itself. As third, products not matching the needed criteria have to be restricted when using known symbols and strategies causing greenwashing. Otherwise, these companies have to be punished by the government with high fines and such scandals should be communicated to the consumers while the production and the offer of actual environmentally sustainable products have to be subsidized much more (e.g., with the greenwashing fines).

Future Research

Even though no influence of demographics on classification accuracy was found, sample composition should be mentioned. Mean age was young, and most participants were highly educated (university students or already with university degrees). However, students are a relevant group of ecological consumers (e.g., Tang et al., 2004). Furthermore, in Study 1, even half of the participants answered to be voters of the political party the Greens (more than half in Study 2), and most participants self-reported to behave ecologically orientated in everyday life (Study 1). To that end, general ecological behaviour was not correlated with classification accuracy. Nevertheless, for further research, a more divergent sample is recommendable, also including male consumers.

Next, the shown scheme of colours perceived as bio/ecologically sustainable or not should be verified again. To clarify, more detailed questions are thinkable, for instance, showing participants both answer options (typical/non typical) for each colour. Moreover, results of the qualitative analysis about the classification strategy let assume that the structure of the material, form design, and quality could be crucial decision criteria to further research on. In line, investigating the classification accuracy ability with stimulus material chosen under another criteria for being an environmental sustainable product than used in our Studies is advisable as well (Study 1: bio-labelled 100% bio textiles; Study 2: certified, ecologically sustainable and fair production). Nevertheless, if including material information, even with the possibility to touch the products (as in a shop or after delivering), it is still assumable that consumers are not able to detect greenwashing. Actual environmentally sustainable products can come with less material quality than non-environmentally sustainable premium products. This might be due to recycling materials, high energy costs that stand against an environmentally friendly production for fulfilling that high quality, or the fact that such products are still part of a niche that is not developed as much as the common production of clothes (were quality standards are implemented).

The effects of Study 1 and Study 2 were found on respondents with a medium but not less average motivation to detect greenwashing. Presumably this level of motivation was caused by the Studie's introduction text about greenwashing scandals and the achievement feedback at the end of the Studies, what also could have influence the negative judgmental bias (tendency to rather classify as non-bio than as bio). Although the effects were shown with a medium detection motivation, according to dual process theories, varying the motivation could be targeted in next research (Chen & Chaiken, 1999; Petty & Briñol, 2011). One could assume that consumers get deceived less by the superficial cues of product colour and price when they are highly motivated to detect greenwashing compared to being low motivated (Isen & Shalker, 1982; Sanbonmatsu & Fazio, 1990; Schwarz & Bless, 1992). Different instructions for and outcomes of the greenwashing detection could address varying motivation.

Also further research should investigate if emotional executional greenwashing aspects of campaigns affect classification accuracy (Hartmann & Apaolaza-Ibáñez, 2009; Hartmann et al., 2016), especially due to effects of mood on category learning (Noseworthy & Goode, 2011). Research on other products is plausible as well.

In addition, as a main important outcome of executional greenwashing influences, a measurement of actual purchase behaviour is relevant. Hitherto, literature focused mostly on purchase behaviour intention and self-rated (fashion) purchase behaviour in general, not the actual purchase decision, demonstrating a gap (e.g., Aertsens et al., 2009; Akturan, 2018; Albayrak et al., 2011; Auger & Devinney, 2007; Chen & Chang, 2012; Goh & Balaji, 2016; Schmuck et al., 2018a, b; Shrum et al., 1995; Wan et al., 2012; Yadav and Pathak, 2017).

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Declarations

Conflict of Interests The authors declare no competing interests.

References

Aamodt, M. G., & Custer, H. (2006). Who can best catch a liar? A meta-analysis of individual differences in detecting deception. *Forensic Examiner, 15*(1), 6–11.

Aertsens, J., Verbeke, W., Mondelaers, K., & Huylenbroeck, G. V. (2009). Personal determinants of organic food consumption: A review. *British Food Journal, 111*(10), 1140–1167.

Aggarwal, P., & Kadyan, A. (2014). Greenwashing: The darker side of CSR. *Indian Journal of Applied Research, 4*(3), 61–66.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211.

Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology, 32*(4), 665–683.

Akturan, U. (2018). How does greenwashing affect green branding equity and purchase intention? An empirical research. *Marketing Intelligence & Planning, 36*(7), 809–824.

Albayrak, T., Caber, M., Moutinho, L., & Herstein, R. (2011). The influence of skepticism on green purchase behavior. *International Journal of Business and Social Science, 2*(13), 189–197.

Altenbuchner, C., Vogel, S., & Larcher, M. (2017). Social, economic and environmental impacts of organic cotton production on the livelihood of smallholder farmers in Odisha. *India. Renewable Agriculture and Food Systems, 33*(4), 373–385.

Ansar, N. (2013). Impact of green marketing on consumer purchase intention. *Mediterranean Journal of Social Sciences, 4*(11), 650–655.

Arnold, O., Kibbe, A., Hartig, T., & Kaiser, F. G. (2018). Capturing the environmental impact of individual lifestyles: Evidence for the criterion validity of the General Ecological Behavior scale. *Environment and Behavior, 50*(3), 350–372.

Auger, P., & Devinney, T. M. (2007). Do what consumers say matter? The misalignment of preferences with unconstrained ethical intentions. *Journal of Business Ethics, 76*(4), 361–383.

Baiardi, D., & Morana, C. (2021). Climate change awareness: Empirical evidence for the European Union. *Energy Economics, 96*(426), 105163.

Baum, L. M. (2012). It's not easy being green … Or is it? A content analysis of environmental claims in magazine advertisements from the United States and United Kingdom. *Environmental Communication, 6*(4), 423–440.

Blair, J. P., Levine, T. R., & Shaw, A. S. (2010). Content in context improves deception detection accuracy. *Human Communication Research, 36*(3), 423–442.

Bless, H., Wänke, M., Bohner, G., Fellhauer, R. F., & Schwarz, N. (1994). Need for Cognition: Eine Skala zur Erfassung von Engagement und Freude bei Denkaufgaben [Need for cognition: A scale measuring engagement and happiness in cognitive tasks]. *Zeitschrift für Sozialpsychologie, 25*(2), 147–154.

Boldt, A., De Gardelle, V., & Yeung, N. (2017). The impact of evidence reliability on sensitivity and bias in decision confidence. *Journal of Experimental Psychology: Human Perception and Performance, 43*(8), 1520–1531.

Bond, C. F., Jr., & DePaulo, B. M. (2006). Accuracy of deception judgments. *Personality and Social Psychology Review, 10*(3), 214–234.

Brécard, D. (2017). Consumer misperception of eco-labels, green market structure and welfare. *Journal of Regulatory Economics, 52*(3), 340–364.

Brito, M. P., Carbone, V., & Blanquart, C. M. (2008). Towards a sustainable fashion retail supply chain in Europe: Organization and performance. *International Journal of Production Economics, 114*(2), 534–553.

Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology, 42*(1), 116–131.

Carey, L., & Cervellon, M.-C. (2014). Ethical fashion dimension: Pictorial and authority depictions through three cultural perspectives. *Journal of Fashion Marketing and Management, 18*(4), 483–506.

Carrigan, M., & Attalla, A. (2001). The myth of ethical consumer: Do ethics matter in purchase behavior? *Journal of Consumer Marketing, 18*(7), 560–578.

Casadesus-Masanell, R., Crooke, M., Reinhardt, F., & Vasishth, V. (2009). Households' willingness to pay for "green" goods: Evidence from Patagonia's introduction of organic cotton sportswear. *Journal of Economics & Management Strategy, 18*(1), 203–233.

Cervellon, M. C., Hjerth, H., Ricard, S., & Carey, L. (2010). *Green in fashion? An exploratory study of national differences in consumers concern for eco-fashion*. https://www.compromisorse.com/upload/estudios/000/114/GreenFashion.pdf. Accessed 6 Sept 2022

Chan, T.-Y., & Wong, C. W. Y. (2012). The consumption side of sustainable fashion supply chain: Understanding fashion consumer eco-fashion consumption decision. *Journal of Fashion Marketing and Management: An International Journal, 16*(2), 193–215.

Chen, S., & Chaiken, S. (1999). The heuristic-systematic model in its broader context. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 73–96). Guilford Press.

Chen, Y. S., & Chang, C. H. (2012). Enhance green purchase intentions: The roles of green perceived value, green perceived risk, and green trust. *Management Decision, 50*(3), 502–520.

Chen, Y. S., & Chang, C. H. (2013). Greenwash and green trust: The mediation effects of green consumer confusion and green perceived risk. *Journal of Business Ethics, 114*(3), 489–500.

Choshaly, S. H., & Tih, S. (2015). Consumer confidence and environmental behavioral science. *Advanced Science Letters, 21*(6), 1923–1926.

Choshaly, S. H., & Tih, S. (2017). The factors associated with the behavioural intention of eco-labelled products. *Pertanika Journal of Social Sciences and Humanities*, *25*(S), 191–202. https://www.researchgate.net/profile/Sahar-Hosseinikhah-Choshaly/publication/322962553_The_Factors_Associated_with_the_Behavioural_Intention_of_Ecolabelled_Products/links/5a79e448aca2722e4df4e8e1/The-Factors-Associated-with-the-Behavioural-Intention-of-Ecolabelled-Products.pdf. Accessed 6 Sept 2022

Clarke, T., & Costall, A. (2008). The emotional connotations of color: A qualitative investigation. *Color Research & Application, 33*(5), 406–410.
Corral-Verdugo, V. (1997). Dual 'realities' of conservation behavior: Self-reports vs. observations of reuse and recycling behavior. *Journal of Environmental Psychology, 17*(2), 135–145.
Crilly, N., Moultrie, J., & Clarkson, P. J. (2004). Seeing things: Consumer response to the visual domain in product design. *Design Studies, 25*(6), 547–577.
Crommentuijn-Marsh, P., Eckert, C., & Potter, S. (2010). Consumer behaviour towards sustainability in fashion. *International Conference on Kansei Engineering and Emotion Research*. https://www.researchgate.net/publication/48989722_Consumer_behaviour_towards_sustainability_in_fashion. Accessed 6 Sept 2022
de Freitas Netto, S. V., Sobral, M. F. F., Ribeiro, A. R. B., & da Soares, G. R. L. (2020). Concepts and forms of greenwashing: A systematic review. *Environmental Sciences Europe, 32*(1), 1–12.
Delate, K., Heller, B., & Shade, J. (2020). Organic cotton production may alleviate the environmental impacts of intensive conventional cotton production. *Renewable Agriculture and Food Systems, 36*(4), 405–412.
De Long, M. (2009). Innovation and sustainability at Nike. *Fashion Practice, 1*(1), 109–113.
Do Paço, A. M. F., & Reis, R. (2012). Factors affecting skepticism toward green advertising. *Journal of Advertising, 41*(4), 147–155.
Ecofriendly Fashion. (2017). *The definition of 'eco'*. http://ecofriendly-fashion.com/what-is-eco/. Accessed 6 Sept 2022
Edwards, J., McKinnon, A., Cherrett, T., McLeod, F., & Song, L. (2010). *Carbon implications of returning unwanted goods ordered online*. https://www.academia.edu/download/3077905/3sdg4arbeoyrwvy.pdf. Accessed 6 Sept 2022
Eichhorn, J., Molthof, L., & Nicke, S. (2020). *From climate change awareness to climate crisis action. Public perceptions in Europe and the United States.* https://www.opensocietyfoundations.org/uploads/d366d228-3b62-45d3-8894-6a2b5d693803/from-climate-change-awareness-to-climate-crisis-action-20201120.pdf. Accessed 24 Dec 2022
Ekman, P., & O'Sullivan, M. (1991). Who can catch a liar? *American Psychologist, 46*(9), 913–920.
Ellen MacArthur Foundation. (2017). *A new textiles economy: Redesigning fashion's future*. https://emf.thirdlight.com/link/2axvc7eob8zx-za4ule/@/preview/1?o. Accessed 6 Sept 2022
European Commission. (2018). *A sustainable bioeconomy for Europe: Strengthening the connection between economy, society and the environment*. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018SC0431&rid=2. Accessed 6 Sept 2022
European Environment Agency. (2022, February 10). *Textiles and the environment: The role of design in Europe's circular economy*. https://www.eea.europa.eu/publications/textiles-and-the-environment-the. Accessed 6 Sept 2022
European Parliament. (2022). *The impact of textile production and waste on the environment (infographic)*. https://www.europarl.europa.eu/news/en/headlines/society/20201208STO93327/the-impact-of-textile-production-and-waste-on-the-environment-inforgraphic. Accessed 6 Sept 2022
Eze, U. C., & Ndubisi, N. O. (2013). Green buyer behavior: Evidence from Asia consumers. *Journal of Asian and African Studies, 48*(4), 413–426.
Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175–191.
Fischhoff, B., Slovic, P., & Lichtenstein, S. (1977). Knowing with certainty: The appropriateness of extreme confidence. *Journal of Experimental Psychology: Human Perception and Performance, 3*(4), 552–564.
Fisher, T., Cooper, T., Woodward, S., Hiller, A., & Goworek, H. (2008). *Public understanding of sustainable clothing: A report to the department for environment, food and rural affairs.* Department of Environment, Food and Rural Affairs. http://randd.defra.gov.uk/Document.aspx?Document=EV0405_7666_FRP.pdf. Accessed 6 Sept 2022
Flynn, L. R., & Goldsmith, R. E. (1999). A short, reliable measure of subjective knowledge. *Journal of Business Research, 46*(1), 57–66.
Frei, R., Jack, L., & Brown, S. (2020). Product returns: A growing problem for business, society and environment. *International Journal of Operations & Production Management, 40*(10), 1613–1621.
Gamba, R. J., & Oskamp, S. (1994). Factors influencing community residents' participation in commingled curbside recycling programs. *Environment & Behavior, 26*(5), 587–612.
Gegenfurtner, A., Lehtinen, E., & Säljö, R. (2011). Expertise differences in the comprehension of visualizations: A meta-analysis of eye-tracking research in professional domains. *Educational Psychology Review, 23*(4), 523–552.

Geiger, S. M., & Keller, J. (2018). Shopping for clothes and sensitivity to the suffering of others: The role of compassion and values in sustainable fashion consumption. *Environment and Behavior, 50*(10), 1119–1144.

Goh, S. K., & Balaji, M. S. (2016). Linking green skepticism to green purchase behavior. *Journal of Cleaner Production, 131*(1), 629–638.

Hansen, T., & Møller Jensen, J. (2009). Shopping orientation and online clothing purchases: The role of gender and purchase situation. *European Journal of Marketing, 43*(9/10), 1154–1170.

Harbaugh, R., Maxwell, J. W., & Roussillon, B. (2011). Label confusion: The Groucho effect of uncertain standards. *Management Science, 57*(9), 1512–1527.

Hartmann, P., & Apaolaza-Ibáñez, V. (2009). Green advertising revisited: Conditioning virtual nature experiences. *International Journal of Advertising, 28*(4), 715–739.

Hartmann, P., Apaolaza, V., & Alija, P. (2013). Nature imagery in advertising: Attention restoration and memory effects. *International Journal of Advertising, 32*(2), 183–210.

Hartmann, P., Apaolaza, V., & Eisend, M. (2016). Nature imagery in non-green advertising: The effects of emotion, autobiographical memory, and consumer's green traits. *Journal of Advertising, 45*(4), 427–440.

Hegerl, G. C., Hoegh-Guldberg, O., Casassa, G., Hoerling, M. P., Kovats, R. S., Parmesan, C., Pierce, D. W., & Stott, P. A. (2010). *Good practice guidance paper on detection and attribution related to anthropogenic climate change.* Intergovernmental Panel on Climate Change. https://archive.ipcc.ch/pdf/supporting-material/ipcc_good_practice_guidance_paper_anthropogenic.pdf. Accessed 6 Sept 2022

Imkamp, H. (2000). The interest of consumers in ecological product information is growing – Evidence from two German surveys. *Journal of Consumer Policy, 23*(2), 193–202.

Isen, A. M., & Shalker, T. E. (1982). The effect of feeling state on evaluation of positive, neutral, and negative stimuli: When you "accentuate the positive", do you "eliminate the negative"? *Social Psychology Quarterly, 45*(1), 58–63.

Jiang, Z., & Benbasat, I. (2005). Virtual product experience: Effects of visual and functional control of products on perceived diagnosticity and flow in electronic shopping. *Journal of Management Information Systems, 21*(3), 111–147.

Joergens, C. (2006). Ethical fashion: Myth or future trend? *Journal of Fashion Marketing and Management, 10*(3), 360–371.

Juslin, P., & Olsson, H. (1997). Thurstonian and Brunswikian origins of uncertainty in judgment: A sampling model of confidence in sensory discrimination. *Psychological Review, 104*(2), 344–366.

Kaiser, F. G. (1998). A general measure of ecological behavior. *Journal of Applied Social Psychology, 28*(5), 395–422.

Kaiser, F. G., Wölfing, S., & Fuhrer, U. (1999). Environmental attitude and ecological behaviour. *Journal of Environmental Psychology, 19*(1), 1–19.

Kaiser, F. G., & Wilson, M. (2004). Goal-directed conservation behavior: The specific composition of a general performance. *Personality and Individual Differences, 36*(7), 1531–1544.

Kärnä, J., Juslin, H., Ahonen, V., & Hansen, E. (2001). Green advertising. *Greener Management International, 33*, 59–70.

Kleene, M., Gebhard, M., Bohnert, A., & Holzhauer, B. (2020). *Eine Frage der Haltung: Nachhaltigkeit, Konsum, gesellschaftlicher Wandel – Utopia-Studie 2020*. Retrieved September 6, 2022, from https://utopia.de/app/uploads/sites/2/2020/03/utopiastudie2020.pdf

Kozar, J. M., & Hiller Connell, K. Y. (2017). Barriers to socially responsible apparel purchasing behaviour: Are consumers right? In C. L. Campbell (Ed.), *The costumer is not always right? Marketing orientations in a dynamic business world* (pp. 79–85). Springer.

Koszewska, M. (2013). A typology of polish consumers and their behaviours in the market for sustainable textiles and clothing. *International Journal of Consumer Studies, 37*(5), 507–521.

Krafft, J., & Saito, R. (2014). *Greenwashing. An experimental study about the effects of misleading and deceptive environmental claims in advertising* [Bachelor thesis, University of Gothenburg]. https://gupea.ub.gu.se/bitstream/2077/38135/1/gupea_2077_38135_1.pdf. Accessed 6 Sept 2022

Laroche, M., Bergeron, J., & Barbaro-Forleo, G. (2001). Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of Consumer Marketing, 18*(6), 503–520.

Lee, K. (2009). Gender differences in Hong Kong adolescent consumers' green purchasing behaviour. *Journal of Consumer Marketing, 26*(2), 87–96.

Lee, J., Bhatt, S., & Suri, R. (2018). When consumers penalize not so green products. *Psychology & Marketing, 35*(1), 36–46.

Leonidou, L. C., Leonidou, C. N., Palihawadana, D., & Hultman, M. (2011). Evaluating the green advertising practices of international firms: A trend analysis. *International Marketing Review, 28*(1), 6–33.

Levine, T. R., Daiku, Y., & Masip, J. (2021). The number of senders and total judgments matter more than sample size in deception-detection experiments. *Perspectives on Psychological Science, 17*(1), 191–204.

Li, C. Z., & Mattson, L. (1995). Discrete choice under preference uncertainty: An improve structural model for contingent valuation. *Journal of Environmental Economics and Management, 28*(2), 256–269.

Lichtenfeld, S., Elliot, A. J., Maier, M. A., & Pekrun, R. (2012). Fertile green: Green facilitates creative performance. *Personality and Social Psychology Bulletin, 38*(6), 784–797.

Lim, D., Baek, T. H., Yoon, S., & Kim, Y. (2020). Colour effects in green advertising. *International Journal of Consumer Studies, 44*(6), 552–562.

Lynas, M., Houlton, B. Z., & Perry, S. (2021). Greater than 99% consensus on human caused climate change in the peer-reviewed scientific literature. *Environmental Research Letters, 16*(11), 114005.

Lyon, T. P., & Montgomery, A. W. (2015). The means and end of greenwash. *Organization and Environment, 28*(2), 233–249.

Mann, D. T., Williams, A. M., Ward, P., & Janelle, C. M. (2007). Perceptual-cognitive expertise in sport: A meta-analysis. *Journal of Sport and Exercise Psychology, 29*(4), 457–478.

Marcketti, S. B., & Karpova, E. E. (Eds.). (2020). *The dangers of fashion: Towards ethical and sustainable solutions*. Bloomsbury Publishing.

Matthes, J., Wonneberger, A., & Schmuck, D. (2014). Consumers' green involvement and the persuasive effects of emotional versus functional ads. *Journal of Business Research, 67*(9), 1885–1893.

Miremadi, M., Musso, C., & Weihe, U. (2012). How much will consumers pay to go green? *McKinsey Quarterly*, *4*. https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/Sustainability/Our%20Insights/How%20much%20will%20consumers%20pay%20to%20go%20green/How_much_will_consumes_pay_to_go_green.pdf. Accessed 6 Sept 2022

Moglia, S. (2018, July 10). *Environmental impacts & solutions within the textile & garment industry*. https://proqc.com/blog/environmental-impacts-solutions-within-the-textile-garment-industry/. Accessed 6 Sept 2022

Murphy, G. L., & Ross, B. H. (1994). Predictions from uncertain categorizations. *Cognitive Psychology, 27*(2), 148–193.

Newell, S. J., Goldsmith, R. E., & Banzhaf, E. J. (1998). The effect of misleading environmental claims on consumer perceptions of advertisements. *Journal of Marketing Theory and Practice, 6*(2), 48–60.

Ng, P. F., Butt, M. M., Khong, K. W., & Ong, F. S. (2014). Antecedents of green brand equity: An integrated approach. *Journal of Business Ethics, 121*(2), 203–215.

Niinimäki, K. (2009). Consumer values and eco-fashion in the future. In J. Koskela, & M. Vinnari (Eds.), *Future of the Consumer Society* (pp. 125–134). Finland Futures Research Centre, Turku School of Economics.

Niinimäki, K. (2010). Eco-clothing, consumer identity and ideology. *Sustainable Development, 18*(3), 150–162.

Niinimäki, K., Peters, G., Dahlbo, H., Perry, P., Rissanen, T., & Gwilt, A. (2020). The environmental price of fast fashion. *Nature Reviews Earth & Environment, 1*(4), 189–200.

Nimon, W., & Beghin, J. (1999). Are eco-labels valuable? Evidence from the apparel industry. *American Journal of Agricultural Economics, 81*(4), 801–811.

Norberg, P. A., Horne, D. R., & Horne, D. A. (2007). The privacy paradox: Personal information disclosure intentions versus behaviors. *Journal of Consumer Affairs, 41*(1), 100–126.

Noseworthy, T. J., & Goode, M. R. (2011). Contrasting rule-based and similarity-based category learning: The effects of mood and prior knowledge on ambiguous categorization. *Journal of Consumer Psychology, 21*(3), 362–371.

Noseworthy, T. J., Wang, J., & Islam, T. (2012). How context shapes category inferences and attribute preference for new ambiguous products. *Journal of Consumer Psychology, 22*(4), 529–554.

Organic Trade Association. (2020). *Organic industry survey*. https://ota.com/organic-market-overview/organic-industry-survey. Accessed 6 Sept 2022

Oxford Dictionaries. (n.d.). *Eco-friendly*. https://www.oxfordlearnersdictionaries.com/definition/english/eco-friendly. Accessed 6 Sept 2022

Parguel, B., Benoît-Moreau, F., & Russell, C. A. (2015). Can evoking nature in advertising mislead consumers? The power of 'executional greenwashing.' *International Journal of Advertising, 34*(1), 107–134.

Pentecost, R., & Andrews, L. (2010). Fashion retailing and the bottom line: The effects of generational cohorts, gender, fashion fanship, attitudes and impulse buying on fashion expenditure. *Journal of Retailing and Consumer Services, 17*(1), 43–52.

Petty, R. E., & Briñol, P. (2011). The elaboration likehood model. In P. A. M, Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.). *Handbook of theories of social psychology* (pp. 224–245). SAGE Publications.

Pospíchalová, Z. (2013). *Green marketing vs. greenwashing*. [Master Thesis, Tomas Bata University in Zlín]. http://digilib.k.utb.cz/bitstream/handle/10563/23541/posp%EDchalov%E1_2013_dp.pdf?sequence=1. Accessed 6 Sept 2022

Quantis. (2018). *Measuring fashion: Insights from the environmental impact of the global apparel and footwear industries. Full report and methodological considerations*. https://quantis.com/wp-content/uploads/2018/03/measuringfashion_globalimpactstudy_full-report_quantis_cwf_2018a.pdf. Accessed 11 Mar 2023

Rao, A. R., & Monroe, K. B. (1988). The moderating effect of prior knowledge on cue utilization in product evaluations. *Journal of Consumer Research, 15*(2), 253–264.

Reilly, A. H., & Larya, N. (2018). External communication about sustainability: Corporate social responsibility reports and social media activity. *Environmental Communication, 12*(5), 621–637.

Reinhard, M.-A., Scharmach, M., & Müller, P. (2013a). It's not what you are, it's what you know: Experience, beliefs, and the detection of deception in employment interviews. *Journal of Applied Social Psychology, 43*(3), 467–479.

Reinhard, M.-A., Sporer, S. L., & Scharmach, M. (2013b). Perceived familiarity with a judgmental situation improves lie detection ability. *Swiss Journal of Psychology, 72*(1), 43–52.

Ripple, W. J., Wolf, C., Newsome, T. M., Gregg, J. W., Lenton, T. M., Palomo, I., Eikelboom, J. A. J., Huq, S., Duffy, P. B., & Rockström, J. (2021). World scientists' warning of a climate emergency 2021. *BioScience, 71*(9), 894–898.

Roberts, J. A. (1996). Green consumers in the 1990s: Profile and implications for adverting. *Journal of Business Research, 36*(3), 217–231.

Roozen, I., & Raedts, M. (2020). The power of negative publicity on the fast fashion industry. *Journal of Global Fashion Marketing, 11*(4), 380–396.

Rosch, E. (1978). Principles of categorization. In E. Rosch & B. B. Lloyd (Eds.), *Cognition and categorization.* Erlbaum.

Sanbonmatsu, D. M., & Fazio, R. H. (1990). The role of attitudes in memory-based decision making. *Journal of Personality and Social Psychology, 59*(4), 614–622.

Scammon, D. L., & Mayer, R. N. (1993). Environmental labeling and advertising claims: International action and policy issues. *European Advances in Consumer Research, 1*(2), 338–344.

Schlichting, I. (2013). Strategic framing of climate change by industry actors: A meta-analysis. *Environmental Communication, 7*(4), 493–511.

Schmuck, D., Matthes, J., Naderer, B., & Beaufort, M. (2018a). The effect of environmental brand attributes and nature imagery in green advertising. *Environmental Communication, 12*(3), 414–429.

Schmuck, D., Matthes, J., & Naderer, B. (2018b). Misleading consumers with green advertising? An affect–reason–involvement account of greenwashing effects in environmental advertising. *Journal of Advertising, 47*(2), 127–145.

Schwarz, N., & Bless, H. (1992). Constructing reality and its alternatives: An inclusion/exclusion model of assimilation and contrast effects in social judgment. In L. L. Martin & A. Tesser (Eds.), *The construction of social judgments* (pp. 217–245). Lawrence Erlbaum Associates Inc.

Seo, J. Y. (2010). *The role of color in environmental messages and claims: Green can be both beneficial and misleading* [Doctoral dissertation, University of Utah]. https://collections.lib.utah.edu/dl_files/3c/94/3c94d48be36313df7c17f4b9d5773ea2710aa26f.pdf. Accessed 6 Sept 2022

Seo, J. Y., & Scammon, D. L. (2017). Do green packages lead to misperceptions? The influence of package colors on consumers' perceptions of brands with environmental claims. *Marketing Letters, 28*(3), 357–369.

Sheridan, M., Moore, C., & Nobbs, K. (2006). Fast fashion requires fast marketing. *Journal of Fashion Marketing and Management, 10*(3), 301–315.

Sheeran, P., Orbell, S., & Trafimow, D. (1999). Does the temporal stability of behavioral intentions moderate intention-behavior and past behavior-future behavior relations? *Personality and Social Psychology Bulletin, 25*(6), 724–734.

Shrum, L. J., McCarty, J. A., & Lowrey, T. M. (1995). Buyer characteristics of the green consumer and their implications for advertising strategy. *Journal of Advertising, 24*(2), 71–82.

Sijtsema, S., Onwezen, M. C., Reinders, M. J., Dagevos, H., Partanen, A., & Meeusen, M. (2016). Consumer perception of bio-based products – An exploratory study in 5 European countries. *Journal of Life Science, 77*(1), 61–69.
Spragg, J. E. (2017). Articulating the fashion product life-cycle. *Journal of Fashion Marketing and Management, 21*(4), 499–511.
Stanton, J. L., & Burke, J. (1998). Comparative effectiveness of executional elements in TV advertising: 15-versus 30-second commercials. *Journal of Advertising Research, 38*(6), 7–8.
Stayman, D. M., Alden, D. L., & Smith, K. H. (1992). Some effects of schematic processing on consumer expectations and disconfirmation judgments. *Journal of Consumer Research, 19*(2), 240–255.
Stephens, S. H. (1985). *Attitudes toward socially responsible consumption: Development and validation of a scale and investigation of relationships to clothing acquisition and discard behaviors* [Doctoral Dissertation, Virginia State University]. https://vtechworks.lib.vt.edu/bitstream/handle/10919/49876/LD5655.V856_1985.S836.pdf?sequence=1. Accessed 6 Sept 2022
Stiff, J. B., Miller, G. R., Sleight, C., Mongeau, P., Garlick, R., & Rogan, R. (1989). Explanations for visual cue primacy in judgments of honesty and deceit. *Journal of Personality and Social Psychology, 56*(4), 555–564.
Stuart, O. (2019). *How do men & women chop for clothes differently?* Freedonia Focus Reports. https://www.freedoniafocusreports.com/Content/Blog/2019/10/01/How-Do-Men--Women-Shop-for-Clothes-Differently. Accessed 6 Sept 2022
Sujan, M., & Bettman, J. R. (1989). The effects of brand positioning strategies on consumers' brand and category perceptions: Some insights from schema research. *Journal of Marketing Research, 26*(4), 454–467.
Sundar, A., & Kellaris, J. J. (2017). How logo colors influence shoppers' judgments of retailer ethicality: The mediating role of perceived eco-friendliness. *Journal of Business Ethics, 146*(3), 685–701.
Tang, E., Fryxell, G. E., & Chow, C. S. F. (2004). Visual and verbal communication in the design of eco-label for green consumer products. *Journal of International Consumer Marketing, 16*(4), 85–105.
TerraChoice. (2009). *The seven sins of greenwashing*. http://healthyschools.org/data/files/Seven_Sins_of_Green_Washing_Poster.pdf. Accessed 6 Sept 2022
Textile Exchange. (2021). *Organic cotton market report 2021*. https://textileexchange.org/app/uploads/2021/07/Textile-Exchange_Organic-Cotton-Market-Report_2021.pdf. Accessed 24 Dec 2022
Thøgersen, J. (2000). Psychological determinants of paying attention to eco-labels in purchase decisions: Model development and multinational validation. *Journal of Consumer Policy, 23*(3), 285–313.
United Nations. (2005). *Resolution A/60/1 adopted by the General Assembly on 16 September 2005*. United Nations General Assembly. https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_60_1.pdf. Accessed 6 Sept 2022
United Nations. (2015). *The Paris Agreement*. United Nations Framework Convention on Climate Change. https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement. Accessed 6 Sept 2022
Valodka, I., Snieška, V., & Mihi-Ramirez, A. (2020). Impact of the international trade on the EU clothing industry carbon emissions. *Engineering Economics, 31*(3), 314–322.
Vrij, A. (2008). *Detecting lies and deceit. The psychology of lying and the implications for professional practice*. John Wiley & Sons.
Wan, C., Cheung, R., & Qiping Shen, G. (2012). Recycling attitude and behaviour in university campus: A case study in Hong Kong. *Facilities, 30*(13/14), 630–646.
Watson, M. Z., & Yan, R.-N.Y. (2013). An exploratory study of the decision processes of fast versus low fashion consumers. *Journal of Fashion Marketing and Management, 17*(2), 141–159.
Xue, F., & Muralidharan, S. (2015). A green picture is worth a thousand words?: Effects of visual and textual environmental appeals in advertising and the moderating role of product involvement. *Journal of Promotion Management, 21*(1), 82–106.
Yadav, R., & Pathak, G. S. (2017). Determinants of consumers' green purchase behavior in a developing nation: Applying and extending the theory of planned behavior. *Ecological Economics, 134*(2), 114–122.
Yan, R. N., Hyllegard, K. H., & Blaesi, L. F. (2012). Marketing eco-fashion: The influence of brand name and message explicitness. *Journal of Marketing Communications, 18*(2), 151–168.
Yang, S., Song, Y., & Tong, S. (2017). Sustainable retailing in the fashion industry: A systematic literature review. *Sustainability, 9*(7), 1266.
Zinkhan, G. M., & Carlson, L. (1995). Green advertising and the reluctant consumer. *Journal of Advertising, 24*(2), 1–6.