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The local range of natural cosmetics: Consumer perceptions and assessments in Germany

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Abstract

Natural cosmetics offer the opportunity to reduce the environmental burden caused by the consumption of cosmetic products. This qualitative study analyzes the local range of natural cosmetics and related consumer perceptions and assessments in two case cities in Germany by applying a mixed-method approach of store checks and the photovoice method. Results of the study show that there is only a limited match of the actual range and consumer perception for some types of retail businesses and a mismatch for product categories. Additionally, participants showed little awareness of the most common natural cosmetic certifications. Consumer assessments about the range of natural cosmetics were influenced by factors such as the arrangement of products in the shops and consumers' experience and knowledge about natural cosmetic brands. Retailers can use the study results in arranging natural cosmetics accordingly; companies can use it to emphasize branding, and policy-makers can increase consumer knowledge about natural cosmetics.

KEYWORDS

bio-based products, consumer perceptions and assessments, green cosmetics, local range, natural cosmetics

1 INTRODUCTION

The cosmetic sector represents a global growing market: According to Precedence Research (2023), the size of the global cosmetics market was estimated at US\$ 341.1 billion in 2020 and is expected to grow to US\$ 560.50 billion in 2023, with major markets in North America, Europe, and Asia. Due to the regular use of cosmetic products, high quantities of cosmetics enter the environment continually, which causes environmental issues because many are environmentally persistent, bioactive, and potentially bioaccumulative (Ternes, Herrmann, et al., 2004; Ternes, Joss, &

Siegrist, 2004). Sustainability in the cosmetic sector gets more and more attention, as reflected in increasing numbers of scientific publications on this topic (Bom et al., 2019) as well as the rising number of industry efforts to drive sustainable development (Cosmetics Europe, 2024).

Alternatives to conventional cosmetics are natural cosmetics that cause less damage to the environment due to their ingredients. Because "natural cosmetics" is not a protected term, legally binding definitions and regulations are lacking. In general, natural cosmetics contain ingredients from natural or organic sources instead of synthetic chemicals (Sadiq et al., 2021).

Abbreviations: BLE, Bundesanstalt für Landwirtschaft und Ernährung; BMWSB, Bundesministerium für Wohnen, Stadtentwicklung und Bauwesen; IKW, Industrieverband Körperpflege- und Waschmittel e, V: IRI, Information Resources, Inc.: LEP, Verordnung über das Landesentwicklungsprogramm Bavern.

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The global market value for natural and organic cosmetics and personal care products amounted to US\$ 37 billion in 2022 and is expected to reach US\$ 58.6 billion in 2031 (Statista, 2022). Focusing on the German natural cosmetic market, annual revenues increased from EUR 600 million in 2007 to EUR 1.48 billion in 2021 (BLE, 2023). In 2022, natural cosmetics had a market share of 10%, and nature-inspired cosmetics of 8.1% in Germany, coming from a market share of 6.9% for natural cosmetics and 5.9% for natureinspired cosmetics in 2012 (BioHandel, 2023).

In Europe, Germany is the biggest regional market for cosmetic products (Cosmetics Europe, 2022). Natural cosmetics emerged in the context of a social movement in Germany and Switzerland, which had developed since the middle of the nineteenth century (Keith, 2022). For this reason, the German natural cosmetic market has a long tradition with established brands. such as Weleda. WALA-Heilmittel. Laverana, Logocos, and Primavera (Beerling & Sahota, 2014). The German natural cosmetic market is very fragmented, with products offered by big and small traditional natural cosmetic companies, many new brands. and startups and several drugstore own brands (Eckert, 2024). The world's leading cosmetic company, L'Oréal, entered the German natural cosmetics market by buying Logocos in 2018 (Logocos, 2022).

In regard to consumer research. Liobikiene and Bernatoniene (2017) only identified few studies that focus on natural cosmetics and, as a result of their literature review, developed a model for the analysis of purchase behavior of green personal care products and colored cosmetics. Their model includes internal, social as well as external motivational factors (Liobikienė & Bernatonienė, 2017). Research on consumer behavior in regard to natural cosmetics has steadily increased in recent years (Bom et al., 2019). The importance of supply is highlighted as one important factor for consumer purchases by Liobikienė and Bernatonienė (2017). However, this aspect is barely covered in previous scientific literature on natural cosmetics. Moreover, scientific insights on consumer reactions related to the local range of such products and also for bio-based consumer goods, in general, are lacking so far (Ruf et al., 2022).

A field where this aspect is already in more consideration is research on food and eating behavior. The influence of the availability of organic or healthy food options in grocery stores is an important aspect of the "food environment" concept (Belon et al., 2016; Díez, Valiente, et al., 2017). Belon et al. (2016) identified the "availability of (un)healthy options in food outlets" as one theme of the physical environment, which is part of the local environment that determines "people's abilities to adopt or maintain a healthy diet." Díez, Valiente, et al. (2017) found the "availability of organic and dietetic food products" to be a category of the consumer food environment. Moreover, Elg and Welinder (2022) consider "the development of an attractive product range" essential for more sustainability in retailing. Further studies identified retail stores as important factors of sustainable consumption (Fuentes & Fredriksson, 2016; Lehner, 2014) and also found that the perception of the naturalness of a product depends on the type of point of purchase (Lunardo & Saintives, 2013). Pudaruth et al. (2015) confirmed that the "visual appeal and physical cues in cosmetic stores" are factors influencing the purchasing behavior of eco-friendly cosmetics and beauty care products.

Because consumer reactions and purchasing opportunities are influenced by the local supply situation, the aim of this study is to analyze the local range of natural cosmetic products at the point of sale in two case study cities in Germany and evaluate consumer reactions to this local supply situation. Germany has been chosen because it has the biggest cosmetic market in the EU (Cosmetics Europe, 2022), and the natural cosmetic trend started in the 1920s in this country (Keith, 2022). This led to the foundation of the first natural cosmetic companies with brands that still exist today. These companies are among the market-leading natural cosmetics companies in the EU (Beerling & Sahota, 2014). Moreover, there are no recent studies dealing with German consumer behavior on natural cosmetics in Germany, as all studies listed in our literature review (Section 2) were conducted in other countries.

This study used two different methods, namely store checks to investigate the local range of products and the photovoice method to identify perceptions and assessments of consumers related to the local supply situation of natural cosmetics. This study analyzes the following research questions in detail:

RQ1: What is the local range of natural cosmetic products and how is it perceived by consumers?

RO 2: Which factors influence consumer perception and assessment about the local range of natural cosmetic products?

This study enriches scientific literature on the local range of natural cosmetics and related consumer reactions and contributes to a field of research that has rarely been analyzed in the past. The results of this study are relevant for shop owners and cosmetic manufacturers to improve supply situations at the point of sale in order to favor consumer choices. Furthermore, the results are interesting from a scientific perspective because they provide empirical insights into the "searching costs" that consumers experience when looking for, evaluating, and purchasing specific niche products in consumer goods markets (Kotler et al., 2016). Additionally, this study is, to the best of our knowledge, the first application of the photovoice method to analyze consumer perceptions related to the local supply situation of nonfood products.

The remainder of this paper is structured as follows: A literature review is the content of Section 2. The methods used are presented in Section 3. Section 4 summarizes the results of the study, which are discussed in Section 5. Furthermore, conclusions and recommendations derived from this study are the content of Section 6.

LITERATURE REVIEW 2

As no uniform legal definition of natural cosmetics exists, scientific literature in this field uses different terms, such as green, natural, or organic cosmetics or personal care products. Thus, studies dealing with consumer reactions and perceptions related to such products are included in the overview in this section. In the following, we use the term "natural cosmetics" as a synonym for this product category.

Consumer research studies in the field of natural cosmetics primarily investigated influencing factors on consumer behavior. Product quality of natural cosmetic products and convenience of the purchase experience (Zollo et al., 2021), perceived functional value (Suphasomboon & Vassanadumrongdee, 2022) as well as product knowledge (Ghazali et al., 2017; Zollo et al., 2021) and brand image and usage experience (Pudaruth et al., 2015) were found to have effects on purchase intentions.

Among the psychological factors, proof in scientific literature was found for the influence of attitudes towards natural cosmetics on consumer purchase intention (Ali et al., 2023; Ghazali et al., 2017; Hsu et al., 2017; Lavuri et al., 2022). Additionally, studies showed the importance of environmental values (Ghazali et al., 2017: Zollo et al., 2021) as well as environmental concern and awareness (Kumar et al., 2021; Oliveira et al., 2024) for purchasing natural cosmetics. Moreover, studies found effects of subjective norms on consumer behavior (Ali et al., 2023; Hsu et al., 2017; Jaini et al., 2020; Shimul et al., 2022) and perceived behavioral control (Ali et al., 2023; Ghazali et al., 2017; Hsu et al., 2017). Other important influencing factors on consumer behavior on natural cosmetics were health consciousness and awareness (Khan & Salim, 2020; Krishna Kishore et al., 2022; Kumar et al., 2021; Oliveira et al., 2024). Besides, innovativeness (Krishna Kishore et al., 2022) and trust, for example, on safety (Lavuri et al., 2022) were found to impact purchase intentions.

A negative effect on purchase intentions was found for greenwashing behavior of firms by Kahraman and Kazancoğlu (2019) and for tradition and image by Sadig et al. (2021). In a study by Kaliyadan et al. (2021), the majority of respondents preferred using cosmetics with organic ingredients, but only 48.1% were willing to pay a price premium.

The few existing studies on labeling and advertising on natural cosmetics show that labeling of green cosmetics was significant for purchase intentions (Patnaik et al., 2021), and green advertisements positively influenced consumer attitudes toward luxury organic beauty products (Lavuri et al., 2022). Pudaruth et al. (2015) identified among others that effective promotion and "visual appeal and physical cues in cosmetic stores" were influencing factors on purchase behavior. Moreover, Grappe et al. (2022) proved that advertisements with environmental and health topics led to positive consumer attitudes. Simão et al. (2022) found that the widely used natural claims on personal care product packaging positively impact consumer purchase intentions.

Among the previous studies dealing with consumer reactions to natural cosmetics, no study was found that analyzed the supply side of such products, although Liobikienė and Bernatonienė (2017) highlighted the relevance of the supply of natural cosmetics for purchasing decisions of consumers. In this sense, a research gap exists on consumer reactions to the local range of natural cosmetics in Germany and elsewhere. We aim to contribute to this underresearched field with this exploratory study.

3 **METHODS**

Two different methods were used in this study in the sense of a mixed-method approach. First, store checks were used to investigate the local range of natural cosmetics, and second, the photovoice method was applied in order to investigate consumer perceptions and assessments regarding the local range of natural cosmetics. Store checks were conducted to gain an actual picture of the supply situation and to put the findings of the photovoice study (namely, subjective perceptions of consumers) into this context. By combining the two methods in a mixed-method study, we aimed to include both perspectives in the analysis.

For this study, two case cities in Germany were selected using purposive sampling. The selected cities were Straubing, with 47,854 inhabitants (Statistische Ämter des Bundes und der Länder, 2023a) and Würzburg with 126,933 (Statistische Ämter des Bundes und der Länder, 2023b) inhabitants at the end of the year 2021. Straubing was chosen as a case city as it is a regional metropolis ("Oberzentrum" [LEP, 2023]) where a lot of the people living nearby do their regular shopping. Thus, in addition to basic and daily needs, the city can also meet the specific needs of inhabitants, which includes, for example, special department stores and specialty shops (BMWSB, 2023). This is important for our study as a large number of individuals from the urban hinterland come to Straubing to shop in case of specific needs (e.g., natural cosmetics). As in Straubing, there are also academic institutions in Würzburg that are active in the field of renewable resources and sustainability, which was a further reason to choose the two cities. In addition, Würzburg is one of three Bavarian regional centers ("Regionalzentrum" [LEP, 2023]) and thus functions as a supraregional trade and economic center. As such, it has similar functions as Straubing for individuals of the urban hinterland but a higher number of inhabitants in the city itself.

3.1 Store checks to investigate the local range of natural cosmetics

Store checks were conducted in the case study cities in order to gather the local range of natural cosmetics. Store checks can be regarded as a form of observation (Mittag & Schüller, 2023). Fuentes and Fredriksson (2016) and Lehner (2014) used store observations to investigate the role of stores in sustainable consumption. Furthermore, the store check method is used in different fields to analyze supply situations and assortments (Cardinali & Bellini, 2014; Deleersnyder et al., 2007; Delley & Brunner, 2020).

A total of 16 stores were examined in Straubing in December 2019 and 14 stores in Würzburg in October 2020. The time interval between the store checks of the two cities was due to the corona pandemic. A quota sampling method was applied to select the examined stores. All stores that are selling cosmetics in the respective city were identified online and assigned to the following categories: discounters, drugstores, food retailing stores excluding discounters, organic supermarkets, perfumeries, pharmacies, and others. The categories were built as they represent the most important venues selling natural cosmetics offline in Germany (IKW, 2019).

One of the research team conducted the store checks on-site. Thereby, the researcher documented the number of natural cosmetic products per product category and certification by writing it on lists prepared for this purpose. By this, the available number of products on the specific date of investigation was collected for the analyzed product categories. Data was collected for the following product categories, in which natural cosmetics are commonly used by German consumers (Statista, 2017): face care, body care, shampoo, shower, and bath, as well as oral and dental care. Furthermore, only certified natural cosmetic products were recorded that carry one of these labels: Natrue, BDIH, Ecocert, BDIH Cosmos Natural, BDIH Cosmos Organic, Ecocert Cosmos Natural, and Ecocert Cosmos Organic. Subsequent to the store checks, the collected data was digitized and stored in an anonymized manner.

Photovoice method to investigate consumer 3.2 perspectives

Consumer perceptions and assessments regarding the local range of natural cosmetics were investigated by using an adapted version of the photovoice method.

3.2.1 The photovoice method

Photovoice is a participatory action research method that is rooted in health science. It was developed by Wang and Burris (1997) on the basis of health promotion principles with the theoretical underpinnings of Paulo Freire's approach to critical education, feminist theory, and documentary photography (Wang & Burris, 1997).

In photovoice studies, members of a group or community take photos of their living environments and evaluate them together in group sessions in order to initiate the process of change (von Unger, 2014). The fact that participants take the photos themselves and evaluate them participatorily as peer researchers is unique for the photovoice method in contrast to other photo-based gualitative research methods (von Unger, 2014). The photos have the dual function of documenting reality and stimulating narrative and discussion (von Unger, 2014).

The photovoice method is especially used in studies on health and social issues (Fountain et al., 2021; Hergenrather et al., 2009; Seitz & Orsini, 2022). Furthermore, it is used in research on community built and social environments (Nykiforuk et al., 2011), for example, in studies on the impact of "food environments" on peoples' abilities to eat healthy (Belon et al., 2016; Díez, Conde et al., 2017; Heidelberger & Smith, 2015; Johnson et al., 2017; Rodriguez et al., 2016). To the best of our knowledge, the photovoice method has not been used in consumer research related to nonfood products up to now. However, it depicts a promising method for investigating consumer perceptions of natural cosmetics as due to the phototaking task, participants of the study are dealing more intensively with the topic and their own behavior and thoughts.

3.2.2 Procedure in this study

The data used in this paper is part of a larger photovoice study that aims to analyze the "bio-based product environment" in Bavaria (Ruf Business Strategy and the Environment

et al., 2021). The photovoice method was applied because it has been proven to be an appropriate method to investigate "food environments," and it was assumed that it can also be successfully applied to nonfood consumer goods. A further advantage of the photovoice method is that potentially unconscious elements are shown by the pictures taken in real-life environments. Additionally, due to the time between the photo task and the discussion in the next group session, participants could take time to think about the topic, which probably led to more comprehensive answers than would have been generated by other methods. The procedure of this study was approved by the ethics committee of the Technical University of Munich and is presented in Figure 1.

For selection of participants, a convenience sampling method was used. Participants of the photovoice study on cosmetics in Straubing were recruited in February and March 2020 via newspaper announcements, flyers, and networks of the authors, while participants for the study in Würzburg were recruited by a professional recruiting agency in June 2021. Requirements for participation were an age of at least 18 years, living and regularly buying cosmetic products in Straubing/ Würzburg, availability on the dates of the group sessions (each participant of the study took part in three photoshooting phases and three group discussions), and enjoyment in taking pictures. Participation was rewarded with EUR 250.

The group sessions in Straubing were planned for March 2020. However, due to the corona pandemic, only the first meeting could be realized in person. The three group discussions of the Straubing group followed online in May and June 2020. The group sessions with the Würzburg group were all conducted online in June 2021.

The first group meeting contained the training and dissemination of information to the participants. Participants were given the definition of bio-based products, were informed about the aims of the project, and given exercises describing pictures and telling the stories behind them. Additionally, they were informed about the ethics of taking pictures and advised to ask for permission from the stores if they wanted to take pictures there. Finally, participants were informed about data protection and data use by the researchers. All of the participants gave informed consent. At the end of the first meeting, the first photo task was given to participants, with the question: "How do you perceive the range of natural cosmetics at local stores?" Participants had no further guidance and were free to take a picture of whatever and whichever place they wanted. Participants were asked to send the respective picture to the researchers via email. The researchers prepared a PowerPoint presentation with the pictures for the subsequent group discussion.

The first group discussion started with feedback about the photo task and related experiences. Afterward, each participant presented his/her picture. They were asked to provide information about the location where the photo had been taken, describe what can be seen in the picture, explain why he/she took this picture and chose it for this group session, and what he/she wanted to express with it. Following, the group discussed about the topics raised. Group discussion sessions 2 and 3 followed the same procedure, but their results are not reported in this text.



- Participants sent their pictures to the researcher via E-Mail
- Researchers compiled PowerPoint presentations with the pictures



FIGURE 1 Procedure of the photovoice study on natural cosmetics. Asterisk (*) indicates that results are not presented in this article.

The group discussions were audio recorded, and one member of the research team took notes. The audio was subsequently transcribed verbatim and analyzed by two researchers using a contentstructuring qualitative content analysis following Kuckartz (2014, 2018) and using Maxqda software. The pictures were not analyzed by the researchers because they had already been analyzed by participants during the group discussions, and the verbal explanations of participants were regarded as sufficient and a better interpretation. According to the methodological process suggested by Kuckartz (2014, 2018), the two researchers read the transcripts intensively and took notes in the first step.

For the coding frame, they formed the categories deductively and inductively by discussing the single topics (see Table A1). The category "Type of (retail) business" and its subcategories were formed



FIGURE 1 (Continued)

deductively as it contains the most important venues selling natural cosmetics offline in Germany (IKW, 2019). The category "Perception of the range of products" and its subcategories were formed deductively following the assumption that the range of products is wide or narrow in different types of retail businesses (Freathy, 2003). Furthermore, the subcategories "No range of products" and "Never noticed a range of products" were added inductively. The category "Product categories" and its subcategories were first formed deductively with product categories, in which natural cosmetics are commonly used by German consumers (Statista, 2017) and supplemented by inductive categories, namely product categories, that participants mentioned during the discussion. The categories "Recognizing natural cosmetics," "Assessments of the range of products," "Perception of packaging and design," "Perception of products," "Perception of brands," "Perception of labels and certifications," "Other influencing factors on consumer perceptions," and their subcategories were formed inductively.

First, the two researchers coded all of the data on their own. Afterward, they compared their coding and discussed the assignments of the text segments until they reached an agreement. In the next step of the analysis, they conducted category-based analyses of the single types of (retail) businesses and the single product categories. The influencing factors on perceptions and assessments were gained by analyzing relations between the single categories (e.g., between "Assessments of the range of products: positive" and "Wide range of products"). Furthermore, the researchers compared the statements between the Straubing and the Würzburg group as well as the statements of different age groups. However, the comparisons did not result in new insights or differences, and thus, they are not outlined in this article. Finally, topic summaries were compiled and verified with appropriate quotes from the raw data material.

4 RESULTS

Section 4.1 presents the results about the local range of natural cosmetic products based on the conducted store checks. In Section 4.2, the results of consumer perceptions and assessments about the local range of natural cosmetics, which had been gained by the photovoice method, are outlined. A comparison between the results of the store checks and the photovoice study is content of Section 4.3. The three subsections give answers to the first research question. Section 4.4 contains the factors influencing perceptions and assessments of consumers and presents answers to the second research question.

4.1 Local range of natural cosmetics

To analyze the local range of natural cosmetic products, five discounters, two drugstores, four food retailing stores, one organic supermarket, one perfumery, two pharmacies, and one specialty store were selected for the store checks in Straubing. Five discounters, two drugstores, two food retailing stores, one organic supermarket, three pharmacies, and one specialty store were examined in Würzburg.

Availability in different types of (retail) 4.1.1 businesses

Table 1 shows the number of natural cosmetic products selected according to our criteria in the analyzed stores in Straubing and Würzburg. The organic supermarket in Straubing had the widest assortment of natural cosmetic products, with 434 items. Although the organic supermarket surveyed in Würzburg also had a wide range (357 products), the most products in this city were identified in the

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	Number of natural cosmetic products										
	Straubing (S) Wü			Würzburg	Würzburg (W)						
Type of (retail) business	A1	A2	A3	A4	A5	A1	A2	A3	A4	A5	
Discounter	6	12	0	0	0	5	0	0	0	0	
Drugstore	279	221				275	249				
Food retailing stores excl. discounter	163	119	10	7		107	0				
Organic supermarket	434					357					
Perfumery	0										
Pharmacy	88	2				14	2	0			
Specialty store S	13										
Specialty store W						390					
Total		1354					1399				

 TABLE 1
 Number of natural cosmetic products per store (A1-5: number of stores).

Source: Promesberger (2020) and own data.

specialty store (390 products). The surveyed drug stores in both cities, presented a similar picture, with 221 and 279 products in the stores in Straubing and 275 and 249 products in the stores in Würzburg.

A very narrow range of natural cosmetic products was found in discounters in both cities, of which seven had even none. The latter result was also found for the analyzed perfumery. Among the surveyed pharmacies, only one had 88 products, whereas the others had few to none. The specialty store in Straubing had only a narrow range, which is also due to the small size of this store. In the "Food retailing stores excluding discounters" category, there was a large variance among the surveyed stores, varying from 163 to 0 products.

In summary, the analysis of the availability of natural cosmetic products according to types of (retail) businesses showed a similar picture in Straubing and Würzburg for organic supermarkets and drug stores with a wide range and for discounters with a scant to no supply of natural cosmetics.

4.1.2 | Availability of products of different categories and with different certifications

Table 2 shows the mean value of natural cosmetic products per product category as well as the total numbers of available products per category, and Table 3 shows the mean values of products with the respective certifications as well as the total numbers of available certified products. In both cities, the vast majority of natural cosmetics were available in the category of face care, followed by body care. The range of shampoo, shower, and bath products was smaller, and the fewest products were available in the category of oral and dental care. Nearly all retail shops offered the most products in the area of face care. An exception was the specialty store in Würzburg, where the highest numbers of products were available in the category of body care.

In both cities, products with the Natrue certification were by far the majority. The second most frequent certification in Straubing was Ecocert Cosmos Organic, and in Würzburg BDIH. In both cities, few products were available with the Ecocert and Ecocert Cosmos Natural certification.

Products with Natrue certification had the largest available items in all stores except the specialty store in Straubing. In line with the total number of available products, the widest range of certifications could be found in the organic supermarkets, drugstores, and the specialty store in Würzburg.

4.2 | Consumer perceptions and assessments about the local range of natural cosmetics

This section presents the results of the group discussions related to the perception of the range of natural cosmetic products. The Straubing group consisted of 10 individuals and the Würzburg group of nine individuals, each with one male participant. The reason for the gender gap is that mainly women consume natural cosmetics (Splendid Research, 2020). Participants varied in regard to age and buying frequency of natural cosmetics (see Table 4).

4.2.1 | Perceptions and assessments related to types of (retail) businesses

During the group sessions, most of the participants discussed the range of natural cosmetic products at drug stores, organic supermarkets, and specialty stores. In addition, a few of the participants mentioned supermarkets, pharmacies, discounters, and street markets.

Drug stores were the dominant shopping location for natural cosmetic products for most of the participants. In general, participants perceived the range of natural cosmetic products at drugstores as wide and diversified. Only a few participants perceived it as narrow compared with the huge quantities of conventional cosmetic products. On the one hand, some participants estimated the wide range to **TABLE 2** Mean value of natural cosmetic products per product category in Straubing (S) and Würzburg (W) and total number of available products per category.

	Face ca	are	Body care		Shampoo		Shower and bath additives		Oral and dental care	
Type of retail business	s	w	s	w	s	w	s	w	s	w
Discounters	1.8	1	0.2	0	0.8	0	0.8	0	0	0
Drugstores	141	137.5	40	44.5	26	32.5	32	37.5	11	10
Food retailing stores excl. Discounter	37	22.5	14	6	8	8	12.3	7.5	3.5	8.3
Organic supermarket ^a	148	161	102	67	60	45	90	57	34	27
Perfumery ^a	0	-	0	-	0	-	0	-	0	-
Pharmacies	22.5	0.7	16.5	2.7	0	0.3	4	1.7	2	0
Specialty store S ^a	0	-	0	-	10	-	0	-	3	-
Specialty store W ^a	-	92	-	157	-	68	-	41	-	32
Total number of products	632	580	272	333	158	195	215	193	77	98

Note: In Straubing 15 stores and in Würzburg 14 stores were analyzed in total. Source: Promesberger (2020) and own data. ^aThere was only one store in this category.

TABLE 3 Mean value of natural cosmetic products by certification and type of (retail) business in Straubing (S) and Würzburg (W) and total number of products per certification.

	BDI	4	BDIH Cosm Natur	, os al	BDIH Cosm Orga	l, nos nic	Ecoce	rt	Ecoce Cosm Natur	ert, Ios ral	Ecocert Cosmo Organie	t, s c	Natrue	
Type of (retail) business	s	w	s	w	s	w	S	w	s	w	S	w	S	w
Discounter	0	0	0	0	0	0	0	0	0	0	0	0	3.6	1
Drugstore	1.5	5	1.5	2.5	4	16	0	0	0	4.5	11.5	5.5	231.5	228.5
Food retailing store excl. discounters	1.5	1	0	1.5	0	1.5	0.25	0	0	0	4.75	6	68.25	43.5
Organic supermarket	36	13	12	6	2	8	8	2	0	0	21	0	355	328
Perfumery	0	-	0	-	0	-	0	-	0	-	0	-	0	-
Pharmacy	0	0	0	0	0	0	0	0	0	0	0	0	45	5.3
Specialty store S	0	-	0	-	0	-	0	-	11	-	0	-	2	-
Specialty store W	-	46	-	41	-	1	-	0	-	0	-	27	-	275
Total number of products	45	71	15	55	10	44	9	2	11	9	64	50	1,201	1,168

Note: In Straubing 15 stores and in Würzburg 14 stores were analyzed in total. Source: Promesberger (2020) and own data.

be positive because this gives the consumer a choice between various products of different brands and various price ranges:

"There you get everything like a spray cure, a conditioner, a shampoo, there are skin creams. (...) And they also have a lot of different products, so it's not only a few ones that you might lose sight of that quickly, but the selection is really wide. There are different types of each product, also from the shampoos, there are some for dry to oily skin or hair. So there's just something for everyone, I would think."

(B4, Straubing group, #107)

On the other hand, some participants estimated the wide range of products as negative because it would be overwhelming for the consumer when choosing a specific product and would require prior knowledge or time to read and search on-site. For some consumers, this is also connected with concerns about the quality and reliability of natural cosmetic products, which are not easily evident at first sight:

> "I also buy a lot at [the drug store] and there I really needed quite a while. That is because of the oversupply. Because it says [Nature] everywhere. (...) But a lot, if you look closely, contain mineral oils, microplastics or are packed in a lot of plastic. It is really difficult (...) to find this natural product."

> > (C8, Würzburg group, #132)

The organic supermarket as a point of purchase for natural cosmetic products was especially discussed by the Straubing group, with differing opinions regarding the range of products. While some perceived it as wide, others perceived it as narrow:

TABLE 4 Demographic variables of participa	nts
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		Group Straubing ($n = 10$)	Group Würzburg (n = 9)	Total (n = 19)
Gender	Female	9	8	17
	Male	1	1	2
Age	18-25	4	5	9
	26-35	1	1	2
	36-50	1	2	3
	50+	4	2	6
Buying frequency	frequently	3	4	7
	regularly	3	3	6
	occasionally	2	2	4
	never	2	0	2

"I was at the organic supermarket and I did perform a targeted search. (...) And now I was quite surprised even in the store, because for years you could not find any hard hair soap, and I was surprised that there is now more and more choice. (...) There are indeed now a number of fragrance variants, but not yet for fine hair or (...) for what is most common now, for dry or brittle hair. So it is still a relatively small selection in my opinion."

(B7, Straubing group, #121)

"I was at [the organic supermarket] and I am looking for a day care cream but also with a sun protection factor. (...) At [the organic supermarket] there is a relatively large area with natural cosmetics. (...) And yes I find it pleasant that is not so quite garish and I did not look at the ingredients and I must say, if it says organic, then I rely on it more or less."

(B2, Straubing group, #243)

Participants also discussed specialty stores such as one-world stores or zero waste stores, where they evaluated the quantity of natural cosmetic products as small, but they did have special products such as hair soaps. Participants assessed the narrow range of products as positive because they did not feel overwhelmed, could ask questions and test products:

> "I have also already been at the zero waste store. (..) They do not have a lot of products, but yes, they have items from body lotions to face cream, just a few products and they are nicely arranged and not the quantity as is the case in drug stores. And what I like [about the zero waste store] is that you can always ask questions."

> > (B2, Straubing group, #219)

In addition, a few of the participants mentioned discounters (one person said that there are no products available, one did not know whether there are any available, and one person said that one natural cosmetic brand is offered there), supermarkets (two persons said that no products are available there), pharmacies (two persons said that the range of products there is narrow), and street markets (one person said that special products are available there).

4.2.2 | Perceptions and assessments related to product categories, certifications, and brands

Participants mainly discussed the range of hair care products, whose range they perceived, in general, to be deep and diversified with products of various price categories. However, participants who knew hair soaps perceived the range of those as narrow. Another frequently discussed product group was decorative cosmetics, whose range participants perceived as small and unsatisfactory because no products are available for, for example, different skin tones or color trends:

> "I have the feeling that as far as the makeup department is concerned, they stopped a few years ago. I also find they do not move along with the topic of diversity and different skin tones. If you look at how many concealers there are in how many colors, there are then just three concealers and they all somehow depict the same skin tone."

(C4, Würzburg group, #95)

In addition, only one participant gave a statement for each of the following product categories: The range of body creams, shower gels, and body oils were perceived as deep and varied, whereas shaving foam was perceived as not available.

Participants talked especially about traditional natural cosmetic trade brands and private label brands, which all use a certification and related labeling system. The majority of participants knew the brands and had bought those in the past; however, they did not know which certifications they use. Overall, participants seemed to have limited knowledge of natural cosmetic certifications, as some of them also mentioned ones such as "eco-test" and "vegan" as a guide when

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making the purchase decision, which do not exclusively have natural cosmetics certifications. The Natrue certification appeared in the discussion of the Straubing group, with one participant informing himself about it for the study. Some participants expressed insecurities about which label one should pay attention to, and others had a general distrust of all of them. Nevertheless, it seemed to be important for most participants that natural cosmetics are certified, and there were different opinions on whether noncertified brands are also natural cosmetic brands.

4.3 Comparison between actual local range of natural cosmetics and consumer perceptions

The highest number of natural cosmetic products was identified by the conducted store checks at organic supermarkets, drug stores, and one specialty store, whereas a small or no range of natural cosmetic products were found in discounters, some food retailing stores, the perfumery, and most pharmacies. Most consumers of the photovoice study were looking for natural cosmetic products at drug stores, some in organic supermarkets, and a few in little specialty stores. Participants of the study did not mention the big specialty store in Würzburg as a place to buy natural cosmetics, nor any of the food retailing stores that were found to have a comparably wide range of natural cosmetic products. For the latter two types of retail businesses, there seems to be a mismatch between the offered assortment and the consumer perception of a good place to buy natural cosmetic products.

An analysis of the number of offered natural cosmetic products in the store checks reveals that the vast majority were face care products, followed by body care products. Most participants of the photovoice study perceived the range of hair and body care products as deep but did not mention face care products in this context, which depicts a mismatch between actual availability and consumers' perceptions.

In addition, the store check study shows that among the many existing certifications, the huge majority of natural cosmetic products had the Natrue certification, but participants of the photovoice study had little knowledge and awareness of these certifications. In contrast, they mentioned certifications that are not pure natural cosmetic certifications as being relevant for their purchase decision.

4.4 Influencing factors on consumers' perceptions and assessments

Consumer perceptions and assessments in stores where natural as well as conventional cosmetic products were offered depended mainly on whether they could easily find and identify the natural ones. Most participants found it first and foremost easier if they were sorted together in one place and labeled. They found it hard if they were positioned side by side with conventional cosmetics on the same shelf. However, there was also one participant who criticized the separation of natural cosmetics from conventional cosmetics. Secondly, many

participants had experience shopping for the products and brands and therefore knew the designs of the product packaging that helped them to recognize the natural cosmetics. According to participants, natural cosmetic products, in particular, use "natural colors" such as green and white and pictures of nature.

On the other hand, participants found it hard to recognize natural cosmetic products when they had difficulties distinguishing between conventional and natural ones. Participants noted that conventional cosmetic products also use pictures of nature or are packaged in recycled or paper packaging. Some participants expressed distrust about companies' intentions and worried about greenwashing. In addition, some participants had difficulties understanding the ingredient disclosures and were unsure about definitions of terms such as organic or natural

The size of the store also impacted consumers' abilities to find natural cosmetic products. For some participants, the very large range of products at drug stores was seen as an obstacle to find natural cosmetic products at this shopping site, whereas participants perceived it easy to find natural cosmetic products at small specialty stores.

Besides the ability to easily recognize natural cosmetic products, the perceived quality and price of the offered products at the different types of (retail) businesses also turned out to be influencing factors. Participants expressed more trust in the quality of offered products in specialty stores and organic supermarkets compared with other retailing types. However, the products offered in these were also perceived to be expensive, and some participants liked the fact that private label brands offered at drug stores are more affordable.

In addition, some participants assessed it positively when natural cosmetic products were nicely decorated and arranged, as was the case at some specialty stores and pharmacies.

5 DISCUSSION

5.1 **Discussion of findings**

This explorative study shows-as investigated by store checks-that the local range of natural cosmetic products in the two case cities varied in different types of (retail) businesses, product categories, and certifications used. The highest number of natural cosmetic products was available at organic supermarkets, drug stores, and one specialty store. A small or no range of natural cosmetic products were found in discounters, some food retailing stores, the perfumery and most pharmacies.

Consumer perceptions and assessments about the local range of natural cosmetics investigated by the photovoice method were diverse. Regarding the perceptions and assessments related to types of (retail) businesses, a general perception of a wide range of products was found for drug stores. A mismatch between the actual product range and consumer perceptions was the case for a specialty store and some food retailing stores. The results of the study related to drug stores as shopping locations with a wide range of products are underlined by the fact that they are the most important distribution

channel for natural cosmetic products, as corroborated by annual sales in Germany (IKW, 2019).

The findings of the store checks showed that the vast majority were face care products, followed by body care products. This is in line with the fact that most revenues of natural cosmetics in Germany were generated with these two product groups (IRI, 2020). Regarding consumer perceptions and assessments related to product categories, participants of the photovoice study especially perceived the range of hair care products as deep but did not mention face care products in this context, which depicts a mismatch between actual product availability and consumers' perceptions.

In addition, our study shows that among the many existing certifications, the huge majority of natural cosmetic products had the Natrue certification. Regarding perceptions and assessments related to certifications and brands, many of the participants of the photovoice study knew the market-leading brands and had bought products of those in the past, but they did not know which certifications are used on the products. The study participants mentioned certifications that are not pure natural cosmetic certifications (e.g., the vegan label) as being relevant. Similarly, a study conducted by Splendid Research (2020) found that the vegan label is the most popular label among natural cosmetic users in Germany. One explanation for the limited relevance of specific certifications for the study participants might be their experience with natural cosmetic brands. It seems that the brands are the most important clue for consumers, while product category-specific certifications are less relevant for product choice.

Regarding the influencing factors on perceptions and assessments of the available range of natural cosmetics, the participants of the photovoice study mentioned that it depends on whether they can *easily find and identify* natural cosmetic products at the point of sale. Most participants found it easy if natural cosmetic products were *sorted together in one place* and *labeled*, *nicely decorated*, and *arranged* at the point of sale, and if they had previous *shopping experience with these products and* related *brands*. In contrast, most participants found it hard if they faced *difficulties distinguishing between conventional and natural ones*, had *distrust about companies' intentions*, had *difficulties understanding the ingredient disclosures*, and were *unsure about definitions of terms such as organic or natural*. Furthermore, the *perceived quality and price* of the products offered turned out to influence consumer perceptions and assessments.

Some of the results of the photovoice study are confirmed by the existing scientific literature on consumer behavior on natural cosmetics. Accordingly, brand image, visual attractiveness and physical signs in stores (Pudaruth et al., 2015), product knowledge (Ghazali et al., 2017; Zollo et al., 2021), convenience of the purchase experience (Zollo et al., 2021) and trust (Lavuri et al., 2022) were found to positively affect consumer behavior on natural cosmetics. Furthermore, the influence of product quality (Zollo et al., 2021) is supported by already existing studies. The few existing studies on labeling and advertising on natural cosmetics show that labeling of green cosmetics is significant for purchase intentions (Patnaik et al., 2021), which depicts a contrast to the findings of our photovoice study.

Kahraman and Kazançoğlu (2019) also found that greenwashing negatively affects consumer purchase intentions.

Key contributions of this study are the findings on discrepancies between the actual range of products and consumers' perceptions and assessments, as a substantial range of available natural cosmetic products had not been perceived by consumers in some types of (retail) businesses. Additionally, this aspect has not been analyzed in previous studies related to bio-based products and thus represents an innovative topic of this article. Moreover, the study enriches scientific knowledge about the factors influencing the shopping experience of customers when buying natural cosmetics. In this context, convenience aspects and low searching efforts turned out to be of specific relevance for the photovoice study participants. Additionally, brand knowledge and trust in natural cosmetic brands were of higher importance than specific labels when identifying natural cosmetic products.

5.2 | Limitations

For the analysis of consumer perceptions and assessments about the range of natural cosmetic products, the mixed-method approach as a combination of store checks and the photovoice method, proved to be a good option beause conformities and divergences between local availability and consumer perceptions were identified. However, the applied methodological mix had some limitations: Although the store checks gave a good insight into the local availability of natural cosmetics, it is only a snapshot of the chosen products at the analyzed stores at a certain time. It cannot provide the total picture of the range of natural cosmetic products in all stores in a case city, not least given the heterogeneity of product ranges as found in the two analyzed cities. For example, we identified no range of products at the analyzed perfumery; however, 7% of sales of natural cosmetics are generated by perfumeries (IKW, 2019). Furthermore, in case a product is sold in the store but not on the shelf at the time of the data collection, it cannot be recorded. This can lead to a slight inaccuracy of our data collection but mirrors the actual situation consumers are facing in the respective shop at the time of investigation.

The applied photovoice method had various positive aspects, such as an understanding of individual determinants of participants' perceptions of natural cosmetics and an active involvement of citizens in research, but also some weaknesses: The small sample size (required for photovoice projects) does not support a diversity of views (Nykiforuk et al., 2011), nor can it claim representativity (not even for the two analyzed cities). The selected cities were both located in Bavaria, and results might be different in other regions of Germany or in other countries in Europe or elsewhere. However, the chosen cities were regional centers with a large hinterland.

Participants had to invest about 7 to 10-h time over a period of 4 months and received EUR 250 as a reward, which might have the consequence that the people who participated in the study were either very interested in the topic of natural cosmetics or were attracted by the money and had the time for the group sessions

and related tasks. The former might be an explanation for why specific types of retail businesses, such as small specialty stores, were perceived very positively, even though they are not popular places for most consumers to buy natural cosmetics. The latter might be an explanation for why many students and older people participated in our study. The transferability and generalizability of the findings are, therefore, not given per se. Moreover, although the qualitative analysis of the discussion transcripts followed methodological guidance by Kuckartz (2014, 2018) and was conducted by two researchers, the analysis might still be influenced by the authors. In addition, although the attempt to apply the photovoice method in consumer research was quite successful in deduction of consumers' perception, we were not able to fulfill the inherent claim of the photovoice method, to involve community members and decision-makers in all stages of the research process (von Unger, 2014).

6 | CONCLUSION

This study, on the one hand, gives valuable insights into the status quo of the local range of natural cosmetic products in Germany, which has an important impact on consumer choices, and on the other hand, into consumer perceptions and assessments about the range of products. The local range of natural cosmetic products in the two case cities varied in different types of (retail) businesses, product categories, and certifications used. Thus, consumer perceptions and assessments about the local range of natural cosmetics were diverse but partly did not follow the available range of products at the time of investigation. Positive perceptions and assessments of consumers were often influenced by the fact that they can easily find and identify natural cosmetic products at the point of sale. The following theoretical and practical implications could be derived from this study.

6.1 | Theoretical implications

Earlier studies on natural cosmetics investigated especially the influence of psychographic characteristics of consumers on purchase behavior (e.g., Ghazali et al., 2017; Jaini et al., 2020; Kumar et al., 2021; Krishna Kishore et al., 2022; Lavuri et al., 2022). The importance of the local supply on consumer behavior has been investigated mainly in regard to food products (Belon et al., 2016; Díez, Valiente, et al., 2017). This study-to the best of our knowledge-was the first study that considers the local range of natural cosmetic products and compares it with consumer perceptions. By comparing the given supply situation with the consumer perspective, it was possible to identify some factors that facilitate consumer choice and experience at the point of sale for natural cosmetic products. In this regard, this study provides answers to the existing attitude-intention-behavior gap in the field of bio-based products (Ruf et al., 2022). Future studies should investigate the topic in other regions or countries and compare the results of this explorative study with those of quantitative studies with larger samples.

Although labels are a much-discussed impact factor on consumer purchase behavior, for example, on nutrition or organic labels on food products (Brückner et al., 2023; Janssen & Hamm, 2014), this study showed that labels seem to be of minor importance for consumer perceptions of natural cosmetics. The store check study has shown that most products had the Natrue certification; however, most participants of the photovoice study did not know or pay attention to this certification. In our study, natural cosmetic brands were found to be more important than certifications to consumers in Germany. Given the long history of natural cosmetic brands in Germany, it would be interesting to research whether this result could also be found in other countries.

From a theoretical perspective, these findings have implications for consumer research literature in the field of "green consumption," as no other study has addressed the impact of the local range on consumer perceptions in this field.

6.2 | Practical implications

First of all, it is important to increase the local range of natural cosmetic products at some types of (retail) businesses where the products are still scarce or not available. In this context, a pull strategy from consumers can motivate retailers with a small supply to increase the range of natural cosmetic products.

Secondly, the results of this study show that there is a mismatch between the available range of natural cosmetics in the analyzed specialty store and some food retailing stores excluding discounters and the participants' estimations that these are good places to buy natural cosmetics. This was not the case for drug stores and organic supermarkets. In consequence, the first two retailing types do not seem to benefit to the same extent as drug stores and organic supermarkets in positive consumer perceptions even though they offer wide ranges of natural cosmetics. While drug stores and organic supermarkets can mainly focus their marketing strategies and activities on existing customers and their strong consumer position, the other two retailing types should aim to attract new customers for natural cosmetics. Food retailing stores could use the regular purchases of food products by consumers as a starting point and inform them about the assortment of natural cosmetic products in the shop. For the specialized store, it seems necessary to attract more customers with (online) communication campaigns or specific events.

An additional result is that especially consumers who had former knowledge about brands recognized natural cosmetic products if these products were displayed together on a separate shelf, which means that retailers should arrange their shelves accordingly with traditional natural cosmetics brands in the center so that these catch the consumers' eyes. In countries where placing specific product groups on separate shelves is not allowed by law, rule makers and regulators should give retailers more freedom in their shelf design. Moreover, a positive assessment of the range of products did not necessarily depend on the deepness of the offered assortment of natural cosmetic products but on an appealing product presentation, clear LEY- Business Strategy and the Environment

structuring of the shelves, and relevant information about the products. This means that the natural cosmetic shelves should be marked green and clearly labeled as places for natural cosmetics. Products could also be marketed with environmental and health aspects on the shelf (e.g., by the use of flyers).

In contrast, a negative assessment of the range of products mainly arose when participants had the impression that it was hard to identify natural cosmetic products and when they expressed concerns about the quality and ingredients of natural cosmetic products and misleading targets of companies. Consequently, a mixed presentation of natural cosmetic products and conventional cosmetics should be avoided on the shelves, and the focus should instead be on natural cosmetic products with either a well-known brand name and/or a trustworthy certification. Additionally, greenwashing should be avoided unconditionally.

Certifications did not seem to heavily support consumer choices and purchases of certified natural cosmetic products. Another option for an easy comprehension of product ingredients would be digital information. Natural cosmetic manufacturers should use, for example, QR codes on the packaging to provide information on ingredients. Additionally, available products could be listed in apps, which allow consumers to check ingredients of products.

Overall, the results of the study indicate that it is important to raise consumer knowledge on certifications, ingredients, and brands of natural cosmetics. This could be accomplished with marketing campaigns or public education strategies by producers or industry associations. Marketing campaigns could focus on environmental and health issues and use social media as a promising channel. The analysis of the local range of natural cosmetic products and consumer perceptions and assessments in the two case cities in Germany has shown a number of ways to improve the range of natural cosmetic products and their presentation to minimize "searching costs" and to support consumer choices for natural cosmetics.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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APPENDIX A

TABLE A1 Coding frame for transcripts on consumer perceptions and assessments of the local range of natural cosmetics.

	Number of coded te	Number of coded text segments				
Categories	Straubing	Würzburg	Total			
Type of (retail) business						
1. Discounter	2	1	3			
2. Drugstore	29	14	43			
3. Food retailing stores excl. discounter	2	1	3			
4. Organic supermarket	11	1	12			
5. Perfumery	0	0	0			
6. Pharmacy	1	1	2			
7. Specialty store	17	4	21			
8. Others (e.g., local markets)	2	0	2			
Perception of the range of products						
1. Wide range of products	9	7	16			
2. Narrow range of products	6	6	12			
3. No range of products	3	3	6			
4. Never noticed a range of products	5	0	5			
Recognizing natural cosmetics						
1. It is easy						
a. Because of the narrow range	1	0	1			
b. Because of labels on the products	1	1	2			
c. Because of the color of the products	4	1	5			
d. Because of the packaging material	0	1	1			
e. Because of the placement	3	2	5			
f. Because of product knowledge	3	4	7			
g. Others	2	0	2			
2. It is hard						
a. Because of the wide range	1	5	6			
b. Because of insecurities on terms and ingredients	0	6	6			
c. Because of the placement	3	0	3			
d. Because of missing declarations on products	2	1	3			
e. Others	1	0	1			
Assessments of the range of products						
1. Negative	4	5	9			
2. Positive	5	2	7			
3. Feeling of consumer deception	2	8	10			
Product categories						
1. Soap	0	1	1			
2. Shower gel	12	0	12			
3. Body oil	10	0	10			
4. Lip care	7	0	7			
5. Hair care	9	4	13			
6. Dental care	4	0	4			
7. Shaving foam	2	1	3			
8. Creme	9	3	12			
9. Decorative cosmetics	5	5	10			
10. Others	0	1	1			

TABLE A1 (Continued)

	Number of coded text segments						
Categories	Straubing	Würzburg	Total				
Perception of packaging and design							
1. Materials	9	6	15				
2. Colors and design	4	9	13				
3. Text and pictures on products	13	5	18				
4. Information on ingredients	11	3	14				
Perception of products							
1. Deception about ingredients	5	4	9				
2. Distrust in product claims	0	5	5				
3. Perception of quality	7	3	10				
4. Perception of price	6	3	9				
Perception of brands							
1. Certified natural cosmetic brands	13	1	14				
2. Classical cosmetic brands	2	1	3				
3. Drugstore own natural cosmetic brands	9	0	9				
4. Noncertified natural cosmetic brands	3	0	3				
Perception of labels and certifications							
1. Assessments	5	2	7				
2. Significance	4	2	6				
Other influencing factors on consumer perceptions							
1. Time	0	3	3				
2. Customer service	2	1	3				
3. Others	2	0	2				
Total	273	138	411				