

# Plastic in skin care cosmetics

## An investigation of the acceptance of plastic packaging and micro-plastics when buying skin care products

Prof. Audrey Mehn, Virginia Odessa Nisha Vogt  
ISM, Germany

### Abstract

Never before has so much plastic existed within the environment as is currently the case. Cosmetics are a significant part of the plastic problem, both in terms of microplastics in the ingredients and through plastic-containing packaging.

Generation Y is often seen as being environmentally conscious and sustainable. Contrary to this however, Generation Y has proven to be carefree when buying plastic cosmetics.

This article is intended to clarify the question of why German women of Generation Y buy plastic-contaminated, caring facial cosmetics, even though they are aware of possible damage. Results of an online survey (N=337) and of a qualitative survey with experts revealed that the main causes for the purchase of plastic-containing, caring cosmetics include the lack of plastic-free alternative products, the lack of transparency of product declarations and the enormous amount of time involved in the search for plastic-free cosmetic.

**Key words:** consumer behavior; cosmetic industry; Generation Y; online survey; sustainability.

### 1 Introduction

The effects of plastic waste are well known, as is the use of plastics in the form of packaging and microplastics in skin care cosmetics. On the other side is Generation Y, whose actions are a mystery to many. This generation is constantly being researched further and is considered to be very self-critical and thoroughly environmentally conscious (cf. Hurrelmann & Albrecht, 2014). There is also research on the specific effects of plastic from cosmetic care products (cf. Schulz, 2018). But why Generation Y, despite its self-critical attitude, buys plastic cosmetics, despite knowing the consequences, remains unexplored. This article is intended to investigate possible motives for the purchase of cosmetic products containing plastic, despite knowledge of the consequences.

## 2 Theoretical background

### 2.1 Plastics and microplastics

Plastics have been used in many different ways for decades due to their durability (cf. Fath, 2019b). A distinction is made between macroplasty, mesoplastic, plastic, microplasty, mini-microplasty and nanoplastic. Macroplastics therefore include every piece of plastic that is larger than 25 millimetres (cf. Crawford & Quinn, 2017).

Microplastics play an important role in industry, e.g. as a polymeric blasting medium. It should be noted that 24 per cent of microplastics originate from private consumption, with microplastics from manufacturing industries lagging far behind at 14 per cent (cf. Bertling, Hamann, & Bertling, 2018).

Socio-economic developments in the past have led to increased production of consumer goods from cheap materials, favoured by the petrochemical industry. Packaging is always in the foreground with a share of the total plastics consumption of 30 to 40 percent, which continues to grow exponentially (cf. Galgani, Pham, & Reisser, 2017).

The plastic cycle begins with the consumer using plastic in any form. For example, in a cleansing gel for facial skin, which ends up in waste water when washed off. From there, the water from the wastewater treatment plants flows into larger rivers. Secondary microplastic parts are added there. If the unfiltered plastic parts end up in the sea, they are part of the food chain from microorganisms to fish, which may end up being sold in supermarkets. (cf. wdr.de, 2016).

Additives are released to the decomposing plastics only when they decompose, as they are not chemically bound to the plastic (cf. Fath, 2019a).

Scientists of the Alfred Wegner Institute examined the water in the Arctic Circle for microplastics in several places and found over 12,000 microplastic particles in one litre of water. (cf. Focke, 2018).

Plastic particles were also found in the stomachs of various species of fish and seabirds, probably containing toxic chemicals (cf. Bertling et al., 2018).

Besides the negative ecological effects, human toxicological effects are to be expected due to microplastics. Effects on organisms through strangulation are to be feared, as well as absorption and excretion through accumulation, translocation and transfer within the food chain. (cf. Bertling et al., 2018).

Inflammatory reactions in mussels as well as behavioural changes in fish could be detected by the uptake of microplastics. However, it should be noted that these investigations were carried out under unusually high microplastic concentrations, which could not be found in nature before. Up to now it has not been possible to determine long-term effects of microplastics on the human organism in a comprehensive way (cf. Schymanski, 2019). Scientists at the University of Vienna were able to detect microplastics in human stool samples. Plastics can also enter the human body via cosmetic products. Microplastics are excreted by the human body. In contrast, nanoplastics can enter the bloodstream and interfere with the absorption of iron or irritate intestinal cells, which can lead to inflammation (cf. Schulz, 2018).

Laboratory studies have shown that microplastics in organisms influence the immune system, fertility and mortality (cf. Bertling et al., 2018).

If many consumers switched to plastic-free products, further damage could be prevented.

## 2.2 Generation Y

Different literature defines the time span of Generation Y, also called millennials, and its characteristics differently (cf. Parment, 2013, p. 7). According to Hurrelmann and Albrecht, those born between 1985 and 2000 belong to Generation Y. This generation uses the Internet without concern and is ambitious to perform well (cf. Hurrelmann & Albrecht, 2014). Serious events in adolescence can shape the whole life, because people in adolescence react hyper sensitively to their environment. As a result, nobody deals with their own environment as actively as young people do. Generation Y experiences in its youth how the internet and social media establish themselves and create a global change (cf. Hurrelmann & Albrecht, 2014). The members of Generation Y are less strictly educated than the previous generations and have grown up in a more prosperous environment. Due to the high number of economic and social opportunities, Generation Y is often described as disoriented. This multitude of private and professional development opportunities often leads to a feeling of being overtaxed, the fear of having chosen the wrong path and thus missing out on something (cf. Moskaliuk, 2016).

The shopping behaviour of Generation Y has also changed with the Internet. They demand transparent advertising and for them cultural diversity is a matter of course. The negative developments of climate change are well known to Millennials (Moskaliuk, 2016).

Baby boomers often classify millennials as apolitical, although millennials see themselves as political (cf. Hurrelmann & Albrecht, 2014).

So if this generation bears the name Y because they question so many things, why do they not take a critical look at their own consumption of plastic cosmetics?

## 2.3 Consumer trend: plastic-free

One of the ten global consumer trends 2019 is "I want a plastic free world". The trend describes how the need of consumers for a plastic-free tarpaulin is constantly growing. Advertising campaigns about the plastic waste in the sea also ensure that consumers understand the extent of the plastic problem. Plastic has never before been such an important topic for consumers and therefore also for companies and corporations. This trend also means that there are fewer opportunities for 'green washing'. Consumers are willing to pay more for environmentally conscious products and recyclable packaging (cf. Angus & Westbrook). Despite increased research in the field of green marketing, Generation Y is still under-researched in relation to buying green products. However, it is known that the millennials represent a huge market potential of 54.3 billion dollars (cf. Lu, Bock, & Joseph, 2013). Environmental awareness can also be reflected in a lifestyle called zero waste, which means that these people produce as little waste as they can (cf. Augsburg Allgemeine, 2019).

## 3 Hypotheses

### 3.1 Consumer responsibility

According to the 2014 Environmental Awareness Study, 64 percent of those surveyed believe that limiting their own consumption is good for the environment. 86 percent think that a change in behaviour in terms of the environment can lead to political and economic action. However this attitude does not necessarily lead to sustainable behaviour. The "mind behaviour gap" describes the difference between attitude and behaviour, which Johnstone and Tan investigated with the help of a focus group. Heidbrink and Schmidt also looked at the mind behaviour gap and described the following (cf. Augustine, 2017):

- Overflow of options
- Uncertainty/ Uncertainty regarding the information and products
- Sense of powerlessness regarding the consequences
- Too high financial expenditure
- Distorted perception due to missing information
- Lack of transparency between consumers and producers
- Renunciation as a core association for sustainable consumption
- Lack of sustainable alternatives

With political consumption, the consumer becomes a "consumer citizen". The consumer expresses themselves through various actions. These include a boycott, as a strong source of power, and the purchase of products, also known as a "buycott" or "green growth" (cf. Augustine, 2017).

The various causes of the mind behaviour gap thus lead to several hypotheses. On the one hand, the theory of a consumer citizen points to a political responsibility that the customer feels. This responsibility is crucial in answering the question why women buy cosmetics containing plastic. Furthermore, it should be noted that female consumers can influence the consumption of plastics by making a targeted product selection at the point of sale (cf. Decker, 2018). This leads to the hypothesis:

**H1:** Women of Generation Y feel a political responsibility when buying cosmetics.

### 3.2 Cosmetic products

Nourishing cosmetics include products that are intended to preserve the natural structure of the skin. This includes cleansing, care and protection. The aim should always be to maintain the condition of normal, intact skin. Accordingly, skin care cosmetics include skin cleansing products, creams, peelings, serums, masks and oils (cf. Kipper & Petsit, 2013).

The cosmetics industry uses synthetic polymers as abrasives, binders, film formers or fillers. In addition, microplastics are used both in particulate and liquid form. Once the particles end up in the sea through the wastewater, they cannot be removed (cf. BUND, 2019).

Despite the voluntary waiver, microplastics continue to be used in these articles, according to a study by Codecheck of over 103,000 cosmetic products. Microplastics are often not transparent for the customer. Nylon-12, acrylate copolymer or acrylate crosspolymer as well as other plastics are microplastics according to scientific definition. However, these substances do not have to be declared as microplastics by the manufacturer. (cf. BUND, 2019).

The most common plastics used in cosmetic products include polyethylene, polypropylene, polyethylene terephthalate, nylon-12, nylon-6, polyurethane, acrylates copolymer, acrylates crosspolymer, polyacrylate, polymethylmethacrylate, polystyrene and polyquaternium (cf. BUND, 2019). The names of these plastics give an idea of how difficult it can be for consumers to unmask these dubious ingredients (cf. BUND, 2016). To this extent, this lack of transparency leads to another hypothesis:

**H2:** Women of Generation Y do not pay attention to plastic packaging and microplastics in the ingredients due to lack of information when buying cosmetics

There are certainly possibilities for the consumer to inform himself about microplastics within the field of care cosmetics. The BUND provides consumers with assistance for plastic-free cosmetic purchases by listing the explicit plastic names in a brochure. This list shows that some

differentiated brands only use microplastics in isolated products and others use microplastics in every product. Thus, it is not possible to say in general which brands for plastic-free cosmetics should be avoided (cf. BUND, 2019).

For consumers, the information source is extremely time-consuming. In addition, the consumer would have to obtain constantly updated shopping guides in order to continue to find out which items contain microplastics, even for newer products.

For this reason, this could also be a motive to buy cosmetics containing plastic, despite the knowledge about the negative effects of plastic. Therefore another hypothesis is:

**H3:** Women of Generation Y do not pay attention to plastic packaging and microplastics in the ingredients when buying cosmetics due to time constraints

### 3.3 Price

Nurturing cosmetics, which are packed in plastic, can be purchased for little money. A peeling gel in plastic packaging, which contains microplastic, costs from 1.45 euros. Also packed in plastic and containing microplastics, day or night care is available from 1.95 euros. Compared to this, the choice of plastic-free skin care cosmetics in drugstores is extremely limited. Plastic-free face creams are also available from 1.95 euros, but the selection is much more manageable. This is due to the lower price of plastics, which in turn can be used in many ways (cf. Pörschke & Eloo, 2016) Serums and oils are easily available with or without plastic for a few Euros. Finding plastic-free cleaning products in the drugstore can be a real challenge. The majority of all articles are packed in plastic tubes or jars. A few plastic-free products are available from ten euros. Similar problems arise when looking for a facial peeling. A plastic-free peeling is available from around 9 euros in the drugstore (cf. dm.de, 2019). It becomes clear how difficult the search for alternative products can be. This leads to the assumption that customers buy cosmetic products containing plastic due to a lack of alternatives and thus leads to the hypothesis:

**H4:** Women of Generation Y buy cosmetics with plastic packaging and microplastics in the ingredients for lack of alternatives since many alternatives are more expensive than their plastic equivalent, this could be a decisive argument for women of Generation Y to buy plastic, skin care cosmetics. Millennials are often still students, trainees or young employees, which suggests limited financial possibilities. The additional costs of plastic-free products could be another reason to buy plastic-containing cosmetics. The hypothesis is therefore:

**H5:** Women of Generation Y do not pay attention to plastic packaging and microplastics in the ingredients when buying cosmetics for financial reasons.

## 4 Method

### 4.1 Research design

To collect the data, a quantitative analysis was carried out in the form of an online questionnaire. Surveyonline.com was used for this purpose, as it offers a wide range of options for creating and subsequently evaluating questions. Using social media such as Instagram, Snapchat and Whatsapp, only women born between 1985 and 2000 were asked to participate in the survey. The survey period extended over four weeks from 25.07.2019 to 25.08.2019. In order to prevent a reactance, the participants were guaranteed anonymity. In addition, the introduc-

tory text asked for complete answers to the questions, the year of birth and provided information about the various products in the field of skin care cosmetics. The years between 1985 and 2000 were divided into three categories. For all other respondents the column "Other" was used. The 18 questions were exclusively asked in closed form and were scaled nominally, ordinally or at intervals. Some additional fields for other answers were given. This should cover optional gaps within the hypotheses. In addition, the participants were given the opportunity to enter their own answer options in the free text. In order to avoid misunderstandings, a small pre-test was conducted with three participants. This showed that the survey was valid and the questions were understood.

#### **4.2 Sample**

The final sample consisted of 338 women who completed the questionnaire in full. All questions asked were mandatory questions, so that premature abortions of the bow could be prevented. Within the sample, only one answer was invalid because the person did not belong to Generation Y. 15 participants could not be considered further when testing the hypotheses, as they did not buy any skin care cosmetics. The majority of the sample, almost 65 percent of all participants, were born between 1996 and 2000 and were between 19 and 23 years old at the time of the survey. Slightly more than half of all participants, 50.9 percent, were students and just under 28 percent were apprentices.

#### **4.3. Expert interviews**

To verify the results of the quantitative study, three face-to-face expert interviews followed in September 2019, the first interview being with a cosmetics expert in a personal interview (Expert A). The expert has already worked in sales for various cosmetic companies.

Expert B is lecturer at a German business school in subjects focusing on strategic ethics and the ethics of virtue. Expert C has been advising well-known companies from the fashion, retail and beauty industry for several years.

### **5 Results**

#### **5.1 Online survey**

Of the 337 valid votes, 120 participants believe that the customer has political power by buying or boycotting certain products. Nearly 55 percent of the participants partially agree with this and nearly nine percent do not believe in the political power of the customer (cf. [umfrageonline.com](http://umfrageonline.com), 2019).

124 participants are of the opinion that the purchase or boycott of certain ingredients can have political effects, and almost 50 percent agree in part. Almost 35 percent answered yes to this question and over 55 percent feel partially responsible. More than half, 51 percent, said that they were aware of the environmental damage caused by plastic and more than 42 percent said that they were largely aware of it.

More than 95 percent of all participants buy face care cosmetics. The remaining 15 participants will be excluded from the results of the upcoming questions due to their non-consumption. Of these participants, more than 62 percent still feel responsible and more than 31 percent feel partially responsible for the products they buy in terms of sustainable aspects.

Of the 322 participants, 111 spend zero to ten euros and 107 spend eleven to 20 euros per month on cosmetics. Almost 20 percent spend 21 to 30 euros per month and almost nine percent

spend 31 euros or more. 83 percent said that a plastic-free future is important to them. Nevertheless, only 31 percent think about plastic when choosing their skin care cosmetics. Nevertheless, almost 78 percent stated that they find microplastics as an ingredient in skin-care facial cosmetics questionable. 165 participants are critical of the use of plastic packaging for skin care cosmetics. In comparison, only nine percent of all women questioned make sure that the cosmetics they buy are not packaged in plastic.

33 percent pay partial attention to microplastic ingredients and 45 percent do not pay any attention at all when buying skin care cosmetics. Almost 65 percent of the participants answered that they often do not know whether microplastics are hidden in a product because of the product declaration. 3 percent of the participants are aware of this. With regard to the packaging, however, 49.7 percent stated that they were clear on the basis of the product declaration whether the respective article is packed in plastic and almost 31 percent agreed with the partial. The survey showed that 101 women are intellectually engaged with the topic of plastic in terms of packaging or as an ingredient. Of the 25.2 percent who did not think about this, 60.5 percent think that a future without plastics is important and 35 percent think that it is important in part.

Now the question arises as to where the dissonance between the participants' attitudes towards plastic and their buying behaviour comes from. 64.6 percent of the respondents answered that they do not know whether microplastics are hidden in cosmetics because of the product declaration.

Of the 145 women who said that they do not pay attention to microplasty, 85.5 percent said that they do not recognize whether microplasty is hidden in the product because of the product description. In addition, 32 percent of the 140 women who do not pay attention to plastic packaging answered that they do not know whether the products are packed in plastic because of the product declaration.

The last question asked specifically for reasons for buying cosmetics containing plastic, which should explain the difference between attitude and behaviour more deeply. As the participants were able to click on several answer options, the answers were accordingly over 322 and over 100 percent respectively. 52.2 percent of the women answered that they lack plastic-free alternative products. 48.8 percent explained their behaviour with reasons of ambiguity regarding the ingredients and packaging of the products. 25.5 percent said that the right products were too expensive for them. No woman explained that *green stigma* is a reason for buying cosmetics containing plastic. Eight women said that they did not have enough evidence of the negative effects of plastic. 17.4 percent said that they already value plastic-free cosmetic products.

The last question clearly shows that almost half of the participants buy cosmetics containing plastic due to the lack of plastic-free alternative products. The second most frequent reason with 48.8 percent refers to the non-transparent product declaration. Furthermore, there is a positive correlation between the 168 women who lack plastic-free alternative products and the same respondents who take too long to find out about all ingredients and products. Here, 56 participants, who answered both questions, were in agreement. Only slightly more than two percent of those questioned felt that the evidence was insufficiently proven. Although slightly, it is nevertheless relevant that women think that their buying behaviour has no effect on the reduction of plastics. In addition, just over five percent answered that they did not feel responsible for their purchases with regard to sustainability aspects. However, these are not the same people who answered in the last question that they assume that their purchasing behaviour has no influence on the reduction of plastics. Only two out of 18 people gave a negative answer in

both cases. This could indicate an error variance. 47 percent of the women who said that they were partly aware of plastic packaging or ingredients containing plastic also said that this was due to a lack of information. Almost 65 percent of these women justified their behaviour by the lack of plastic-free alternatives.

## **5.2 Qualitative survey**

When asked what reasons there might be for women of Generation Y to buy plastic-containing cosmetics despite knowledge of the negative effects, expert 1 initially suspected too little choice of plastic-free alternatives and also explained that glass bottles would be a disadvantage for women who travel a lot due to their high weight. In addition, the expert explained that she saw the cost of natural cosmetics as a relevant reason and then gave an insight into the cosmetics industry by explaining how important trust is in the field of skin care cosmetics. She suspected that some women have the impression that their own behaviour cannot change the overall result. The customer advisor added that some customers were not concerned about the effects of their own waste consumption. Finally, Expert A added that truly sustainable companies do not advertise it enough. She explained that often not even the employees knew exactly which projects the company was currently supporting because the companies did not want to brag. Many large cosmetics companies claim to be green and sustainable, but no one checks this out. This is how she substantiated her assumption that the lack of or even wrong marketing could be a reason.

Expert 2 believes in the power of the customer by boycotting products but only if the company is publicly damaged by negative headlines for example. Basically, one person can do this. Expert B emphasized the transparency that is also at stake here in our society. In addition, he drew attention to the so-called transaction costs in hypothesis four. These describe how much effort the respective person has to make to obtain the necessary information. If these costs are too high, then many people do without them and prefer to rely on brands they know. With regard to green products, Expert B made it clear that these are only beneficial if the product continues to offer the core advantages. Moreover, green washing is one of the reasons for a lack of trust in companies. The expert compared nanoparticles with noise. Because if noise were visible, like garbage, people would remain calm. Then the consequences would be visible and immediate, but if a lot of plastic is used, there are no acute consequences and so it is better to think away. The expert also explained that some people feel overwhelmed by the responsibility for the entire product supply chain. In conclusion, he added that plastic could be socially abolished by making it unacceptable.

In the course of the interview, Expert C explained the buying behaviour of the millennials by stating that beauty and cosmetics have a stabilising effect on the psyche in an ever-changing world. She also made it clear that beauty is crisis-proof and is given higher priority by most women than political responsibility, since the cosmetics industry is almost the only sector that has not felt the effects of the global economic crisis. The expert stressed that there are few alternatives to conventional plastic tubes or jars on the current cosmetics market and that the alternatives are more price-intensive. In a price-driven market such as the German market, it is difficult to pass on the additional costs completely to the consumer. In addition, she revealed that conventional plastic packaging was perfectly justified because it was cheap, protected the contents well and did not mix with the product. Up to now, there has been a lack of suitable alternative packaging, as glass has the disadvantage that it is easily breakable, very heavy when



travelling and it is not known how harmful it is. With regard to the micro-plastic ingredients, it is difficult and very time-consuming for customers to trace the seals of the various manufacturers.

### 5.3 Assessment of the hypotheses

After the examination of the experts, it remains open whether the hypotheses can be verified or falsified:

**H1:** Women of Generation Y feel a political responsibility when buying cosmetics.

The questionnaire shows that 90 percent feel at least partly politically responsible for the purchase of their cosmetics. In addition, 86 percent think that boycotting or buying certain ingredients can have at least partial political consequences. According to Expert C, many women want to reject this responsibility and may feel overwhelmed to take on the responsibility for the entire supply chain. This could indicate that the political responsibility is only partially felt. Expert B added that although the target group feels politically responsible, when it comes to the decision between beauty and cosmetics or political responsibility, beauty almost always prevails because it is closer to people than the effects of plastic. This in no way contradicts the results of the questionnaire. Thus hypothesis H1 can be verified.

**H2:** Women of Generation Y do not pay attention to plastic packaging and microplastics in the ingredients due to lack of information when buying cosmetics

Since 64.6 percent of the respondents did not know whether micro-plastics were hidden in cosmetics due to the product declaration and 145 women said that they did not pay attention to micro-plastics, this can be attributed to a lack of transparency. Of the 140 women who do not pay attention to plastic packaging, 32 percent said that they do not know whether the products are packed in plastic because of the product declaration. In addition, 48 percent of the women justified their purchases containing plastic with the lack of information due to the lack of transparency regarding the ingredients and packaging of the products. Expert C explained that although companies are committed to transparency, the seals are often not understood by customers. Thus hypothesis H2 can be verified.

**H3:** Women of Generation Y do not pay attention to plastic packaging and microplastics in the ingredients when buying cosmetics due to time constraints

107 out of 323 valid responses from women stated that this was a decisive reason for buying cosmetics containing plastic. The ethics expert, Expert B, also explained this behaviour with the lack of involvement. The statement of Expert C, the time-intensive research into the meaning of the seals on sustainable products, could also serve as an explanation. Based on the questionnaire and the expert interviews, the hypothesis H3 can be verified.

**H4:** Women of Generation Y buy cosmetics with plastic packaging and microplastics in the ingredients for lack of alternatives.

52.2 percent of the women interviewed answered that they lack plastic-free alternative products, which is why they consume cosmetics containing plastic. Expert A stated that there are many suppliers of natural cosmetics, but then advised that they also use partially degradable plastic and thus do not offer completely plastic-free alternatives. Expert C revealed in the interview that there are hardly any alternatives to conventional plastic tubes and jars for the cosmetics industry. The H4 hypothesis can be verified by the questionnaire and the supplementary interviews.

**H5:** Women of Generation Y do not pay attention to plastic packaging and microplastics in the ingredients when buying cosmetics for financial reasons

Since 25.5 percent of the participants stated that they use cosmetics containing plastic because the plastic-free alternatives are too expensive for them and since the natural cosmetics Expert A also considers the financial aspect to be relevant, thus hypothesis H5 can be verified.

#### **5.4 Recommendations for action**

The German Association for the Environment and Nature Conservation is calling for a Europe-wide ban on synthetic polymers in cosmetic products. Recent years have shown that a voluntary withdrawal of the cosmetics industry cannot be relied upon, while the source of the environmental pollution could easily be avoided (cf. BUND, 2019). The behaviour or boycott of plastic-containing products from the consumer side could be the solution for a future with less plastic. The quantitative investigation showed however that the lack of alternative products and the ambiguity of the ingredients makes it very difficult for consumers to buy plastic-free. A simplification of the terms and thus a saving of time on the part of the consumer could be a remedy.

This will require necessary changes on the part of politicians for companies and plastics manufacturers. For example, rules on the clear labelling of products containing plastic by means of appropriate seals could help to make it considerably easier to buy cosmetics without plastic.

Algae could offer another possibility to work without plastics. In contrast to plastic, algae is sustainable, multiply quickly and do not produce any waste products. So far no disadvantages could be found. The solid and at the same time flexible structure can be used as an optimal packaging material. (cf. quarks.de, 2019).

## **6 Conclusion**

Part of the criticism of the excessive consumption of plastic is blamed on the consumers of cosmetics containing plastic. The evaluation of the hypotheses has shown that the lack of alternatives, the lack of transparency in product declarations and the high expenditure of time for information are among the main causes of non-consumption. The additional costs of plastic-free alternatives also tend to deter consumers from choosing alternative products. The supplementary qualitative surveys conducted by the experts confirmed the results of the quantitative analysis and could also provide suggestions for further research. However, the experts also spoke out in favour of very different motives: wrong marketing approaches, a lack of awareness of injustice and, of course, the desire for safety and beauty of the young target group.

With the help of the questionnaire as well as the expert interviews, almost all the goals formulated in the objective were achieved. On the one hand, the research question could be answered, on the other hand, the sub-goals could be achieved.

Nevertheless, the quantitative survey, in relation to the sample, must be viewed critically. Since the survey was advertised on various platforms with the help of only one social media account, it is relatively likely that the majority of the women questioned come from North Rhine-Westphalia in Germany. In relation to a nationwide research, this point should be critically assessed. In addition, it is highly probable that most of the interviewed women come from a similar social class. The age distribution of Generation Y within the questionnaire should also be critically examined. This distribution can be traced back to the contacts of social media advertising.

Furthermore, the sample should be critically scrutinised, as there was no security question to check whether only women participated in the survey or whether some men left the previous briefing to the discretion of the interviewees and thus took part in the survey. In addition, there were indications of a variance in the last question of the questionnaire regarding the political responsibility of women clients. There was one general question and one regarding cosmetics. Out of 18 women, only two participants had answered both questions in the same way (cf. [umfrageonline.com](http://umfrageonline.com), 2019).

Already during this work, the subject of plastics, also in relation to cosmetics, received increased attention. With a view to the future, this increased attention could also be accompanied by a further increased desire for a plastic-free future on the part of consumers.

As the beauty industry itself is of the opinion that there is no way around a plastic-free future and the pressure to innovate tends to increase with social pressure and the desire of consumers to live a plastic-free life, it can be assumed that female consumers will have more choice of plastic-free products in the future. The growing trend of striving for a low plastic future could be exploited, especially with regard to the cosmetics industry, in that plastic-free skin care products that are also used in public could lead to a green attitude for customers. This means an improved social status by emphasizing one's own sustainable lifestyle using obviously sustainable cosmetics.

The extent to which the marketing of natural cosmetics companies influences the purchasing behaviour of the millennials in terms of skin care cosmetics remains to be clarified. It remains to be seen how much women of Generation Y are willing to pay more to acquire plastic-free cosmetics. It also remains to be seen whether the current high pressure on the 'plastic industry' can be maintained and whether a social rethink will be initiated. A difficult undertaking, especially for beauty products.

## References

- Angus, A., & Westbrook, G. *Top 10 Global Consumer Trends 201*. Retrieved from Euromonitor International.
- Augustine, S. *Die Generation Y und Integrated Reporting*. Dissertation, Wiesbaden: <http://dx.doi.org/10.1007/978-3-658-21734-1>.
- Bertling, J., Hamann, L., & Bertling, R. (2018). *Kunststoffe in der Umwelt: Mikro- und Makroplastik*. Oberhausen: Fraunhofer Institut.
- Bund für Umwelt und Naturschutz Deutschland e. V. (BUND) (2016). *Mikroplastik in Kosmetik: Freiwillige Selbstverpflichtung der Hersteller ist wirkungslos*. Retrieved from <https://www.bund.net/service/presse/pressemitteilungen/detail/news/mikroplastik-in-kosmetik-freiwillige-selbstverpflichtung-der-hersteller-ist-wirkungslos/>.
- Bund für Umwelt und Naturschutz Deutschland e. V. (BUND) (2019). *Mikroplastik und andere Kunststoffe in Kosmetika: Der BUND- Einkaufsratgeber*. Berlin. Retrieved from [https://www.bund.net/fileadmin/user\\_upload\\_bund/publikationen/meere/meere\\_mikroplastik\\_einkaufsfuehrer.pdf](https://www.bund.net/fileadmin/user_upload_bund/publikationen/meere/meere_mikroplastik_einkaufsfuehrer.pdf).
- Crawford, C. B., & Quinn, B. (2017). Microplastics, standardisation and spatial distribution. In *Microplastic Pollutants* (pp. 101–130). Elsevier.
- Decker, T. (2018). Achtung Plastik! Wie Verbraucher(innen) beim Einkaufen Plastikmüll reduzieren können. *GAIA - Ecological Perspectives for Science and Society*, 27(3), 330–331.

- dm.de. „Mikroplastik“ – ein komplexer Sachverhalt | dm.de. Retrieved September 16, 2019. Retrieved from <https://www.dm.de/unternehmen/engagement/nachhaltigkeit/kunststoff-mikropartikel-c1118164.html>.
- Fath, A. (2019a). *Mikroplastik kompakt: Wissenswertes für alle. essentials*.
- Fath, A. (2019b). *Mikroplastik: Verbreitung, Vermeidung, Verwendung*. Villingen-Schwenningen: Springer.
- Focke, J. (2018). *Mikroplastik im arktischen Meereis* [Radiobeitrag]: WDR 5.
- Galgani, F., Pham, C. K., & Reisser, J. (Eds.) (2017). *Plastic pollution*. [Erscheinungsort nicht ermittelbar]: Frontiers Media SA.
- Hurrelmann, K., & Albrecht, E. (2014). *Die heimlichen Revolutionäre: Wie die Generation Y unsere Welt verändert*. Weinheim, Basel: Beltz.
- Kipper, K., & Petsit, X. (2013). *Dekorative Kosmetik und Gesichtspflege: Teil A: Produkt Know How* (2.th ed.): wissenschaftliche Verlagsgesellschaft Stuttgart.
- Lu, L., Bock, D., & Joseph, M. (2013). Green marketing: what the Millennials buy. *Journal of Business Strategy*, 34(6), 3–10.
- Moskaliuk, J. (2016). *Generation Y als Herausforderung für Führungskräfte: Psychologisches Praxiswissen für wertorientierte Führung. essentials*. Wiesbaden: Springer.
- Parment, A. (2013). *Die Generation Y: Mitarbeiter der Zukunft motivieren*. Wiesbaden: Gabler.
- Pörschke, S., & Eloo, C. (2016). Ersatz von Mikroplastik in kosmetischen Produkten. *Chemie Ingenieur Technik*, 88(7), 874–880.
- Schulz, R. (2018). *Mikroplastik-Studie: Auch Menschen haben es in sich* [Radiobeitrag]: WDR 2.
- Schymanski, D. (2019). Mikroplastik: die Geister, die wir riefen. *Journal of Consumer Protection and Food Safety*, 14(1), 1–3.
- umfrageonline.com (2019). *Akzeptanz von Plastik*. Retrieved September 29, 2019. Retrieved from [umfrageonline.com](http://umfrageonline.com).
- wdr.de (2016). *Mikroplastik - Aus dem Badezimmer auf den Speiseplan*. Retrieved September 11, 2019. Retrieved from [wdr.de: https://www1.wdr.de/wissen/natur/mikroplastik-tabelle-barrierefrei-100.html](https://www1.wdr.de/wissen/natur/mikroplastik-tabelle-barrierefrei-100.html).