



# HOW GRAPHIC DESIGN CAN BENEFIT AND HARM CONSUMERS IN THE PERCEPTION OF SUSTAINABLE FOOD PACKAGING

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# Abstract

This master thesis is about how consumers' perception of graphic design and visual cues affect the ability to recycle and determine material components in packaging. As well how these cues are utilized by companies in either beneficial or deceptive ways towards the consumers. Utilizing research techniques such as qualitative semi-structured interviews, additive quantitative surveys, work from previous research, scheduled meetings, and additional desktop research and peer-reviewed articles. The research in question was limited to the Norwegian market only, as to keep the scope for this master relatively concise and feasible. Building upon previously done research for an article written for the E&PDE2022 conference, this master uses previous research and feedback in constructing its mock-ups and methodologies. It is highly recommended to read the previous article, "How graphic design can influence the perception of sustainable food packaging" (Gjerde, 2022). Additionally, the aforementioned article published for EPDE2022 builds upon another article written by PhD. Candidate Nigel D. Steenis. The goal for both the previous article and the research presented in this article is to obtain a better understanding of consumer perception of the cues present in everyday food packaging. In addition the goal for this master thesis is to acquire a deeper understanding of how these cues in return affects consumers' buying decisions and trust of packaging companies and brands in general.

## Keywords

*Graphic Design, Green Design, Greenwashing, Packaging, Consumer Perception, Cue Utilization*



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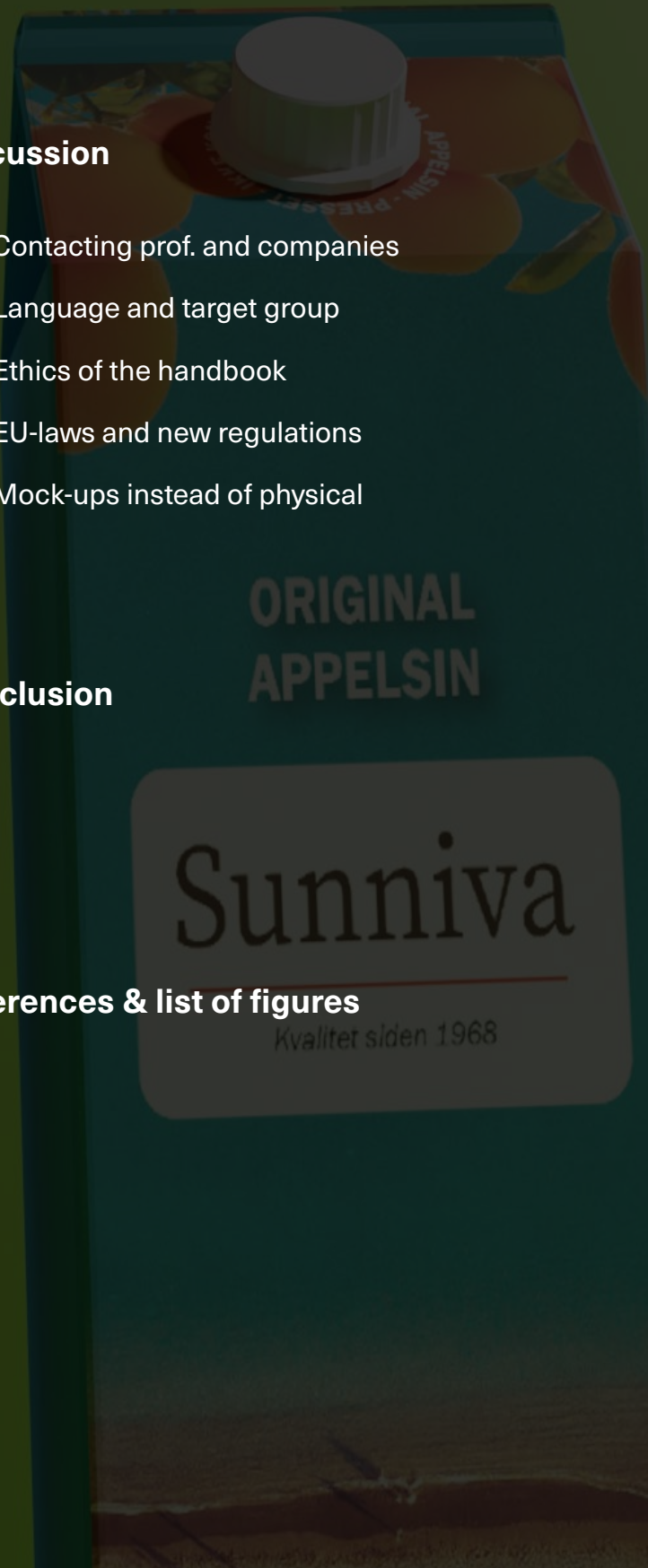
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# Introduction

As information has become easier to spread throughout the 21st century by different means of technological advancements, advertisement has become more rampant and prominent in everyday lives more than ever. One form of advertisement often not perceived as advertisement is packaging. While packaging serves a needed purpose of preservation and containment of products in transport and on store shelves, the visual design depicted on the surface of the packaging can be considered more an artistic expression. It does however serve an important purpose of emotionally attaching the consumers to its products and conveying its content, which in of itself can be seen as a necessity, especially for corporations. As different companies attempt to appeal more to consumers through any legal means possible, trends and contemporary topics become a field of interest for these companies. One of these topics being the environment and its preservation. While the environment and the threats it faces are more urgent topics rather than contemporary, many companies see the opportunity of appealing to the environmentally conscious. Subconsciously perceiving packaging certain ways can lead someone to believing it is more sustainable for the environment, despite no evidence to support. In other words, examples of greenwashing. As such, the question becomes what exactly are the cues in graphical packaging

design affecting the consumers' purchasing decisions, and are they for better or worse?

The goal for this project is to dwell deeper into how cue utilization in graphic design effects the perceived sustainability of the products we consume. This article is an extension of another article submitted and performed at the EPD&E conference in the autumn of 2022, titled "How graphic design can influence the perception of sustainable food packaging" (Gjerde, 2022). Which explored consumers response to a series of fake mock-ups utilizing the Sunniva® Original orange juice 1 litre carton as its base, with different graphics applied onto a 3D-modeled base. The article itself was pilot research in response to an article by Nigel Steenis, regarding consumer response to packaging (Steenis et al, 2017). Some of the designs from the previous article are brought into this master for further development and changes. Notable opinions and regards of these designs have been taken into consideration and used in developing the new designs utilized in this master. Due to the continuation of an existing research article, the base for the mock-ups is still the Sunniva® Original orange juice 1 litre carton. Additionally, the topic of greenwashing is highlighted through certain designs cues for the new mock-ups.

With all the most vital information taken into consideration, the research thesis for this master can be summarized as following:

**How does cues in graphic design affect the perceived sustainability and environmental perception of food packaging, and how can knowledge of these cues be utilized in both harmful or positive ways towards consumers?**



# Similar research & Background

## Similar research done

As this master is a continuation of another study, which itself was building upon another article written by Nigel D. Steenis (Steenis et al, 2017), it is only fitting to explore other research of similar topics. An article written by Karin Wagner regarding the social semiotics of packaging design mentions the social conventions related to semiotics and their interpretation (Wagner, 2015). What certain imagery means to a culture varies, as such this research is limited to the Norwegian consumer market only. That does not mean that participants and volunteers from other countries residing in Norway are excluded, but rather that any results should consider Norwegian norms and behaviour into its explanation. Akin to Steenis' (2017) article, the research done opens for a supplementary study to create a greater understanding of the topic and consumer responses. While Wagner (2015) conducted several interviews to graphic design firms and marketing managers, this study aims to better understand how consumers themselves see different cues in a more visualized and tangible scenario. Hence this article's methodology of creating believable mock-ups to utilize in more intimate interviews with the consumers. In the case of Steenis (2017), the research focused mainly on the packaging itself, with few alternations in the visual design outside the packaging. This study aims to fulfil and create a greater context by adding supplementary research that's focuses on the visuals of the packaging.

## Greenwashing and consumers

A study published in the South African Journal of Economic and Management Sciences experimented with greenwashing's effect on buyers' willingness to purchase products marketed using perceptive greenwashing tactics. The study highlighted how users' awareness of the concept was crucial in whether they would purchase the product. Consumers aware of

environmental issues, but not wary of greenwashing, would be easier to mislead through greenwashing advertisements. One group of consumers with more knowledge on the topic would recognize cues utilized in greenwashing and thereby not let themselves be exploited as easily. In fact, the same group of consumers would be less inclined to purchase a product if they could decipher the use of greenwashing tactics and language (Volschenk et al, 2022). Green brand association can have a strong effect on consumers decision to purchase a product, which in return is also open to be abused. Greenwashing has negative effects on brand credibility, and indirectly has a detrimental effect on brands and consumers, reducing trust and credibility for actual green brands (Akturan, 2018, pp.820-821). Importance of honesty in marketing is demonstrated in how unaffiliated brands with respectable intentions are under suspicion of similar greenwashing acts as those who commit it.

## Print buyers' willingness to compensate

While the consumer is ultimately where products and their packaging end up, it is important to consider the print buyers willingness to comply with any potential findings. After all, it is their decisions which decides what will eventually be added onto the packaging. An experiment conducted on 11 professionals print buyers highlighted the priority of gamut, also known as the colour space available on a device. In this study, 40% prioritized gamut size over carbon footprint, VOC emission and image resolution. Four participants favoured image quality, while five saw environmental impact and image quality as equals, meaning environmental benefits was not the priority for the print buyers (Mayte-ekriengkrai, 2013). This does highlight a wish amongst graphic- and print enthusiasts for high quality in their work. However, it also shows a willingness to compensate if their craft is not extensively compromised.

# Creating mock-ups & Methodology

## Qualitative and quantitative research

Originally the research done for the E&PDE2022 conference was conducted using mixed methodology research (MMR), combining quantitative and qualitative research. An unfortunate shortcoming was the lack of participants to justify a quantitative data research, with the input of merely 10 volunteers. Initially the quantitative data of the former article was reasoned for through mixed methodology of explaining the data. Qualitative data such as participants' opinions and thoughts become the explanatory factor for any data gathered in the quantitative research phase (Leavy, 2017, pp.164, 171 – 173). Qualitative data in this case is referring to semi-structured interviews conducted with willing participants. While the previous article used qualitative interviews to explain quantitative data as the mixed method research, this article utilizes the methodology of embedding the data instead. Both approaches give supplementary meaning to the gathered research, however, embedding means for one set of data to supplement or augment the other data. In this case the qualitative semi-structured interviews are the main research form, while the quantitative data will support and enhance findings from the interviews (Leavy, 2017, pp.172 – 179). The quantitative research is cross sectional survey research, sampling information from one point in time with the data gathering format being questionnaires (Leavy, 2017, pp.100 – 102). A total of 25 qualitative interviews were planned, with a desired 200 answers from the quantitative survey.

## Cue utilization

Design can be seen as the common international term for shaping and finalising the appearance of a product through the intentions of usability and visual appeal (Dyrhaug, 2022). Mankind has evolved to consider traits such as shapes, colours, size, and their context and interactions

together for survival even to this day (Olson et al, 1972). Cue utilization can be explained as when a consumer lacks knowledge of a product they ascertain multiple visual traits to determine predictive and confidence values. Shapes, colours, size, and more are analysed. Predictive value is to what degree a cue is associated with positive or negative benefits, while confidence value is the users' confidence in their decision making based on the given cues (Steenis et al, 2017, pp. 288-289). Printed imagery of nature is a cue resonating a healthy environment, though, to what extent this nature print provides any actual benefits for the environment is for the consumers' confidence to determine.

## Creating seven new orange juice designs

Due to the continuation of an existing research article, the base for the mock-ups presented in this article is also the Sunniva® Original orange juice 1 litre carton. Like that of the previous research article, interviewing participants involved creating new graphical design variants of the Sunniva® orange juice. The designs were then to be showcased for volunteers to speak their opinions regarding sustainability and environmentally friendly perception. Many of the designs were brought over from the previously written article for the EPDE2022 conference and altered based on feedback. Additional designs are wholly original. Each design has a specific philosophy behind them for exploring the packaging topic. The designs were all made in Adobe Illustrator using vector graphics, filters, vectorized illustrations and additional photography. Afterwards the seven designs and their alterations were imported onto a custom-made carton made by research Henrik Kongsli Gjerde in the 3D-modeling software Blender. The model for the carton copied that of the dimensions of the Sunniva® Original orange juice 1 litre carton. A simple white background was added, with the carton centred middle. The purpose of this render was

to allow the interviewed to easier comprehend the juice packaging and its dimensions to that of a real carton, rather than using excessive time and resources in creating semi-believable real-life paper mock-ups. Rendering the model from a specific angle also removed the need for redesigning the other sides of the carton, saving much time. However, the lack of physical interaction with the mock-ups is acknowledged in further detail later in this article. The different renders were then compiled together into the three image sets that were utilized in the interviews. All cartons were meant to be made of the same material and coated finish, with the graphical appearance being the only variable.

A total of 7 new designs were created for the qualitative interviews, with a set of A, B and C alternations. Category A are the main designs themselves, while category B and C consists of mostly similar designs but with a few slight variations from their original variants. The idea is to interview with different iterations of the design to explore the enhancements certain cues has on the interviewed in the context of a specific design. A separate pair of 10 participants were interviewed about set A and B, totalling of 20 participants. Design C received only 5 interviews, as only one design varied from the other sets. In total, 25 semi-structured qualitative interviews were conducted, with the following interview questions:

- **What is your age?**
- **What is priority when buying juice/milk?**
- **Which design would you buy in store?  
(Based the designs presented, A, B or C)**
- **How would you rank them from least to most environmentally friendly?**
- **How would you recycle all the cartons?**
- **What do you interpret from the saying "environmentally friendly graphic design"?**

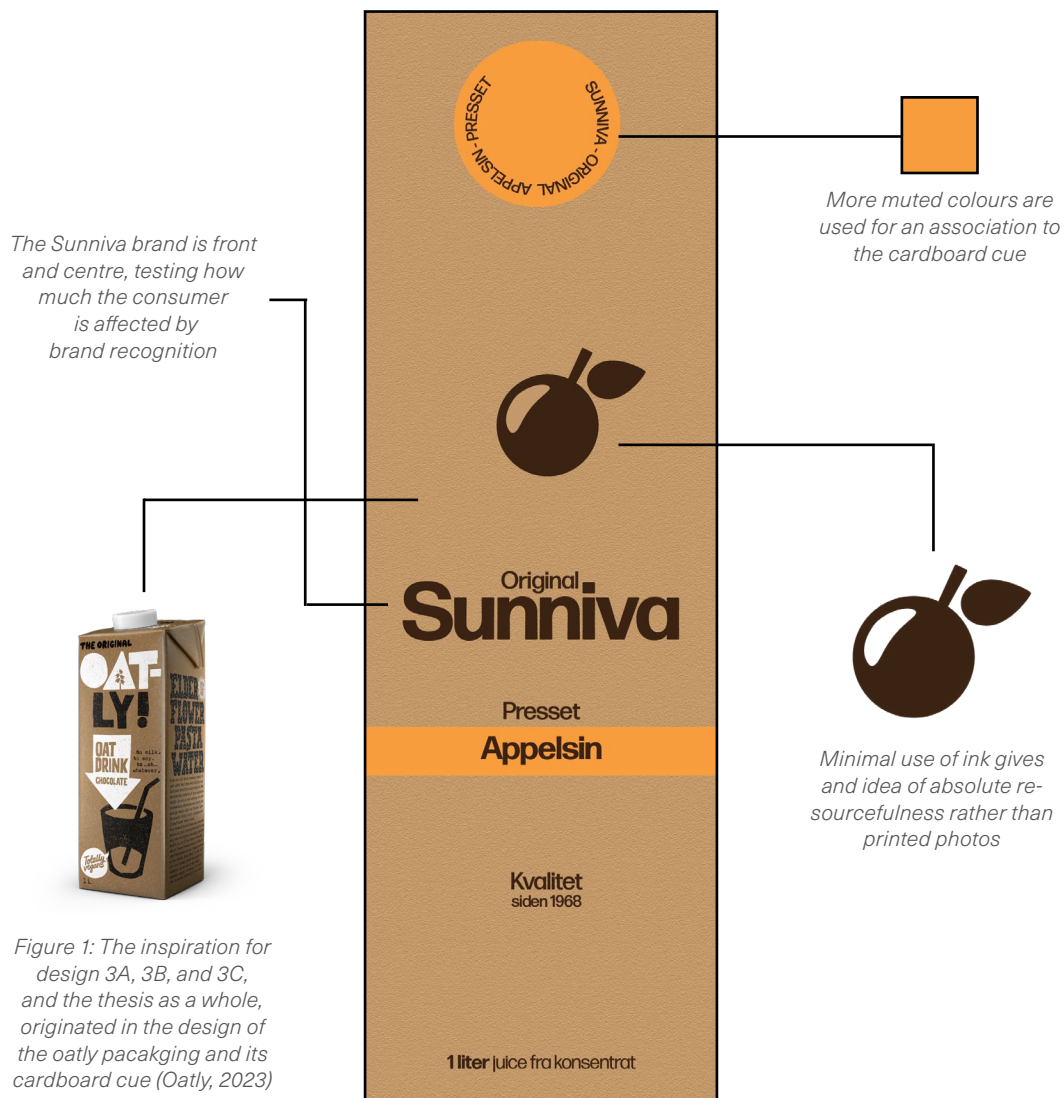
*To the right, in-engine image of the carton being in the 3D-modelling program Blender. The next pages contains the designs applied as textures*



## Design 1:

# Paper texture

The idea for design 1A, 1B and 1C was inspired by the packaging of the oat-based milk by the Oatly company. This packaging appears with an almost cardboard-like, grainy texture, coloured in greys and browns. Especially the brown packaging subconsciously emphasizes the use of paper. However, the glossy finish on the outside appears no different than any other milk carton. Thereby the paper-like texture serves no other effect than being purely cosmetic. This observation was the inspiration for design 1A, 1B and 1C, using a noise filter to give the brown packing an impression of a paper-like texture. Additionally, the design has a minimal use of black print to give an impression of resource conservation. The design also adds an additional emphasis on the branding, Sunniva®, through a bold variant of the typeface forma DJR banner. Testing if participants felt drawn towards brand familiarity.



## Design 2: Photography

Certain Norwegian milk brands such as TINE feature imagery of Norwegian nature on the front of their packaging. This emphasises where the milk is from and gives a sense of quality approval by appealing to feelings of nationalism. Design 2A and 2B takes advantage of the nationalistic appeal by using an image of Geirangerfjorden in Møre & Romsdal. The label is small and the typeface for Sunniva® is a calmer serif variant, allowing the focus to be on the scenery. Additional oranges at the bottom emphasis the content inside. Overall, the idealistic imagery can either be seen as a close contact with nature, or a wasteful use of resources and possible attempt of greenwashing. Seeing as oranges are not grown in Norway design 2C use photography of Spain instead. The goal being to see if participants would feel more trust in a brand's honest about their origins, or if they prefer the nationalistic angle instead.

Even the label takes its inspiration from the TINE milk carton



Figure 2: Design 2A and 2B took its photo and label cue from idyllic Norwegian landscape similar to the portrayal on TINE melk (TINE, 2023)



Figure 3: The image used in design 2A and 2C is that of Geirangerfjorden, evoking feelings of nationalism (Runkel, 2021)



Figure 4: Real oranges are used to enhance feelings of nature and clarify the type of juice (Wong, 2019)

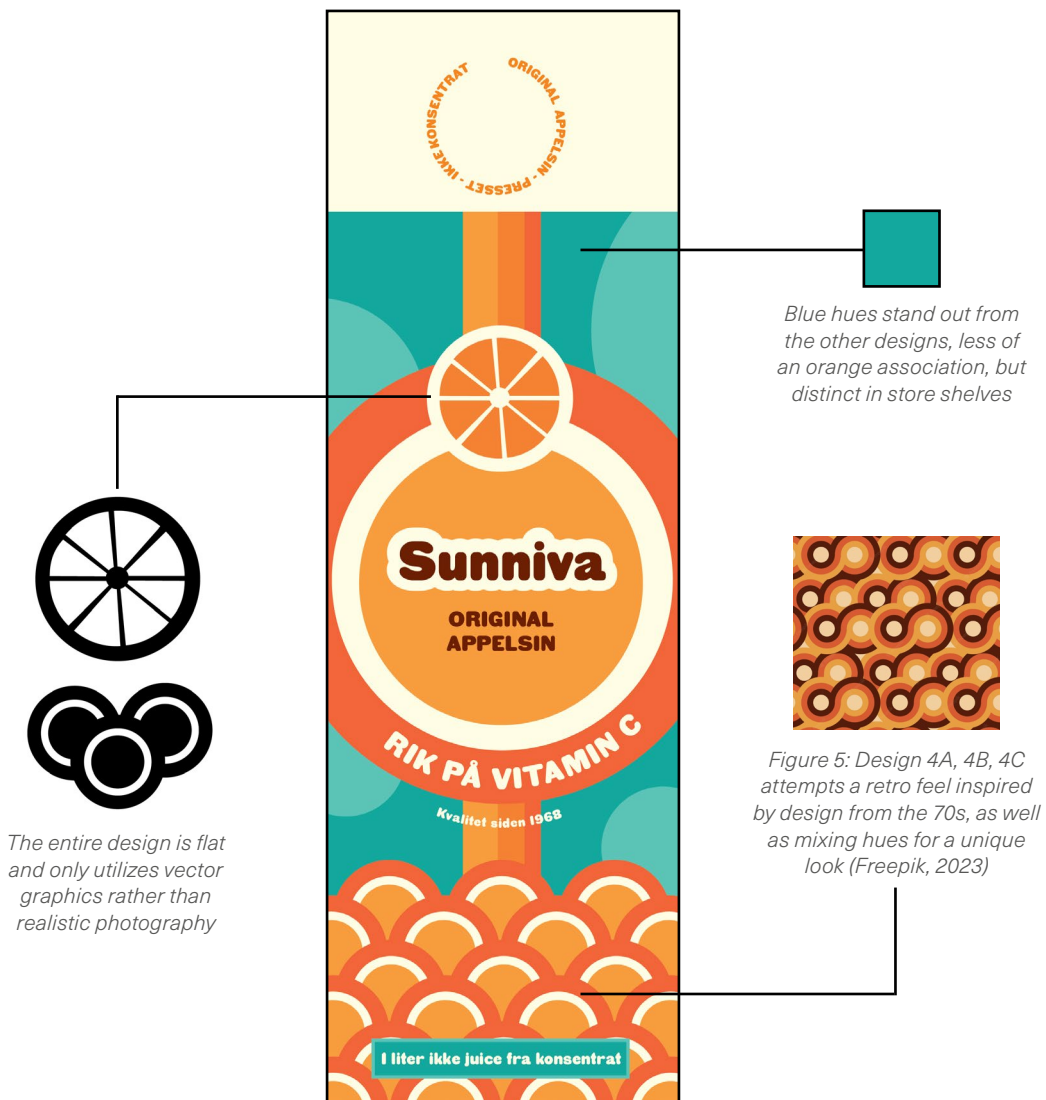
## Design 3: Rustic Illustrations

Design 3A, 3B and 3C are all meant to seem as if they were made by smaller brands. The oranges were drawn in Procreate and imported to illustrator to add a handmade touch. The typeface chosen, ImaginaryFriend BB, was meant to give a whimsical and overall, less professional feeling of the carton itself. Together exploring whether the consumer would feel attracted to smaller more local brands. Combined with a simple colour scheme, the design tests if the volunteers believe more local and less graphical design equals a genuine product with more environmental consideration. Also, the emphasis on vitamin C and health benefits are more present.



## Design 4: Retro & Different

Design 4A, 4B and 4C attempt to capitalize on feelings of retro and trendiness. The orange slices are reminiscent of swanky designs from the 70s, with the turquoise complementing the orange colours of the juice. Main incentive of this design was to test out more uncommon designs that still feel somewhat familiar. Design 4 slightly attempts to capitalize on nostalgia while mainly focusing on being trendier and more unorthodox in its appearance. Adding opposing colours to the design also challenge the first impressions of what the volunteers recognize as orange juice. Overall, the design focus more on visual appeal than renewability or perceived environmental benefits, testing to what degree this is truly a priority for the volunteers.



# Design 5: Cartoony & fun

Design 5 remains the same throughout all tests, with its inspiration being that of children's juice design and cartoony logos. The goal is to appear more fun and colourful, similar to design 4. As well as to what extent the heavy saturation, gradients, and colour contrast appeal to an adult audience. Additionally, if more saturated colours causes a negative impression of ingredients or sustainability. This is also the only design to not focus on the Sunniva® brand, testing if this affects the interviewed.

**JUICE  
JUICE**

"Strokes" add a cartoony effect to make the juice and its lettering seem more fun, combined with more rounded typefaces



Figure 6: Playfulness and fun was 5A, 5B, and 5C main philosophy, with more saturated colours similar to that of Solrik (Meny, 2023)



The orange colour palette is more saturated compared to the other designs, testing if saturation matter for perceived recyclability or appeal

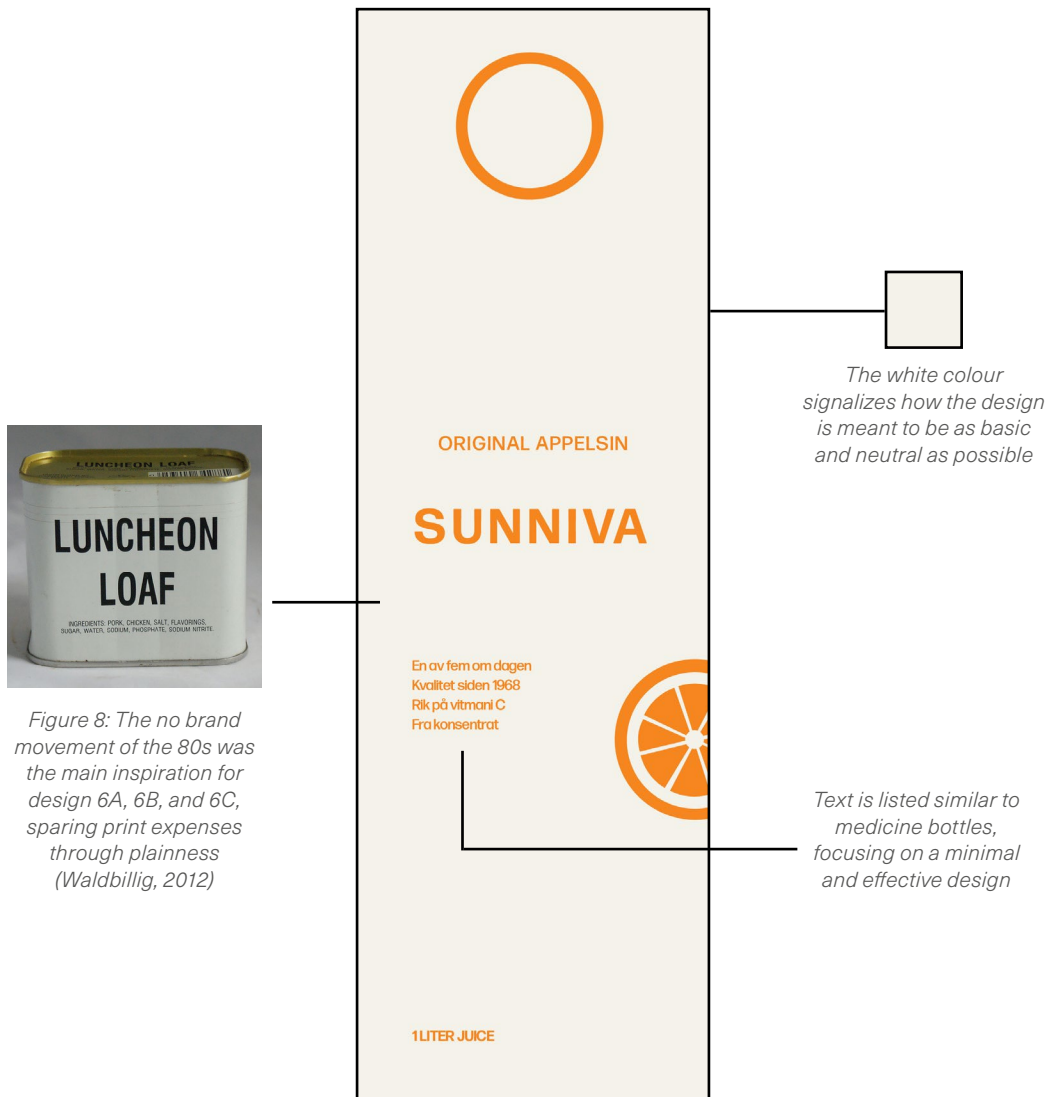


Figure 7: The round typeface seen in Kuli and additional strokes around the word "juice" (Handlenor, 2022)



## Design 6: Minimalistic

Design 6 is another design with no alternates. This design takes a stance on having as little design as possible, except for an orange slice to its right side. Like the generic products fad of the 80s (Waldbillig, 2012), the idea behind designs 6 is to remove all logos and additional graphic visual of the packaging, leaving nothing but text and a stark contrast. Rather than using black print such as in the 80s fad, the text is in orange to emphasis the content side. Would consumers feel the more minimal design and less production is a better choice for the environment, and would they still feel intrigued to buy the juice? There is also the question of whether such a simplistic design would either be perceived as a cheap or high-end product.



## Design 7: Metallic & oranges

Design 7 combines two designs and cues from the E&PDE2022 article. These cues being the metallic sheen coating and the realistic oranges on the front of the packaging. A discovery during the last research was how participants felt the metallic sheen was the least sustainable cue added to any carton. A stark contrast from the confidence of the cardboard-like packaging and instead being considered residual waste by some. Contrary is the use of real oranges, which gave impressions of fresh and environmentally sound juice. The goal of design 7 is to see if this cue outweighs the appeal of the natural oranges, or if the participants ignore the metallic sheen in favour of a design that features its main ingredient on the front. This metallic sheen was later utilized for design 2B to test the same theory, but with nature photography.

*The combination of the metallic sheen and natural oranges are meant to contrast each other to see how the volunteers react*



*Figure 9: The metallic coating finish is inspired by the IsKaffe (TINE, 2022)*



*Figure 4: Real oranges are used in design 7A, 7B, and 7C to see the effect of natural ingredients against metallic coating (Wong, 2019)*

## Shortcomings of quantitative data

While the qualitative interviews go into depth about ranking the different designs and their interpretations of the different cues, the quantitative results are purely based on what participants believe to be the most and least environmentally friendly designs. This is due to the convenience of using google questionnaires, but also the limitations of the program itself. More specifically not having a drag-and-drop system to allow all the answers to be ranked easily. To ensure participants would not be easily confused by elaborate setups, the ranking was limited to only ask for the most and least environmentally friendly designs. Any potential alternate rankings through google questionnaire would complicate and easier allow for misinterpretations. The quantitative survey does additionally ask the participants to rank their favourite design they would like to buy in store. Initially the goal was to achieve 200 participants, however, only 69 responses were harvested.



Figure 10: All mock-ups in test A was made by researcher Henrik Kongsli Gjerde

## Results from Interview A

### Acknowledgement of number of participants

Totally 10 participants were interviewed and questioned about their preferences in test A. The age range varied between 23 to 56 years old. While this might seem like a varied selection of participants, it needs to be acknowledged that the 56-year-old interviewed was an outlier from the average participant's age. The overall age range of participants was closer to 23 to 30 years old. All participants in test A had some experience or education within design, albeit from different fields of design and universities. Initially this specific selection of volunteers was a result of convenience and accessibility, hence the narrow variety of age and field of profession. However, this also gives insight into how designers of different design fields interpret the mock-ups with their additional knowledge of production and the process behind it. While the target group of the mock-ups were everyday consumers, it does not exclude the professional opinion from those within the field of design. Often the input from designers allows interpretations that are subconscious in the average consumer, but able to be articulated into words by those with field experience. Later tests conducted in test B and C introduced volunteers outside design professions, as to value other consumer opinions.

## Notable findings: Design 1A

Most participants believed design 1A to be the most sustainable amongst all presented options. Other participants believed it to be second-most sustainable, while one notable participant believed the design to be in a middle point. The reasoning behind this was the perceptive material being used. Majority of participants associated the brown colouring with cardboard or cheaper to produce paper-packaging. The use of minimal ink also played a significant role in its positive perception of sustainability. However, one participant saw this as being a deceptive tactic in greenwashing, claiming that the packaging was coated brown to appeal more to environmentally conscious consumers. The minimal ink use did however prevent it from ranking amongst the bottoms.





## Notable findings: Design 2A

While the previous design had a mostly clear perception of its sustainability factors, design 2A caused the biggest separation between participants, with an equal distribution in the top and bottom tiers. The consensus amongst the participants who placed design 2A in the bottom tiers was the excessive usage of ink and the imagery portrayed. With the addition of blue hues and a photography to reproduce, the design seemed more expensive and toll-heavy for the environment due to more chemicals being used, at least according to the participants. Meanwhile other participants felt the choice of photography was deceptive. Geirangerfjorden is depicted on the outside, being a recognized Norwegian natural phenomenon. Certain participants acknowledged that orange production in Norway is rare, with majority of growth taking place in warmer climates such as Brazil, India, and China, as well as Spain in Europe (Ervik, 2022). This led many participants to be sceptical about the honesty of the company, seeing as the origin of the oranges was disguised in favour of evoking feelings of Norwegian nationalism. However, this seemingly worked as several participants ranked the juice higher due to a feeling of “homemade”, while others associated the emphasis on Norway with higher quality standards. One participant mentioned less transportation and more assurance of quality when products are locally made. These associations were taken into consideration for the only new redesign later utilized in test C.

## Notable findings: Design 3A

General consensus regarding design 3 was to place it amongst the more environmentally friendly designs. The minimal colour use was the main deciding factor. Due to the use of hand drawn illustrations, many participants felt the designs had a more childish sense to it. Whether this was seen as a positive or not varied, with some participants seeing it as cosy and locally made, while other perceived it as cheap brand compensation for the overall quality of the juice. Others felt the branding was of higher quality. Overall, feedback was rather inconsistent.







## Notable findings: Design 5A

While design 5A received a slight better impression than design 4A in terms of recyclability, it still ranked at the bottom with three people viewing it as the least sustainable. Design 4A and 5A had a close negative perception, with design 4A receiving slightly more flack for its excessive colour usage. However, it seemed design 5A ranked lower less because of its more complicated design, and more so because of the childish association certain participants felt. While the design is more convoluted and intricate than some of the alternatives, the association to sugary, artificial, and sticky drinks mattered more for the negative connotations which made participants feel it had less consideration for the environment. Design 5A gave an impression of trying to compensate for its production with added sugar, and as one participant exclaimed, "show off design". Alternatively, one participant expressed their fondness for sugary drinks and thereby preference for the design. However, they still acknowledged the artificiality of the juice, placing it lower in terms of environmental consideration.





## Notable findings: Design 6A

Easily the plainest design of the mock-ups, design 6 received a high perception of environmental friendliness within the participants. Minimal colours and print led many to believe its production was less cost-expensive than its contemporaries. While this sentiment was echoed in 9 out of 10 participants, one person ranked the design at the very bottom. The minimal design had gone too far and given an impression of a cheap product, signalling that the production behind it had not taken the environment into consideration when producing the juice. Impression of cheaper production seemed to be a paradox in which it is cheaper and less costly to produce, but also cheaper and less consideration for production. Overall, the less ink use gave a positive impression of environmental friendliness, but as other participants in later tests pointed out, there was a need for some additional visuals. Several participants said they would purchase the juice in store.

## Notable findings: Design 7A

Last design in test A was design 7A, with an overall mixed reception in terms of recyclability, but with a significant majority of participants choosing it as their personal preference. Its environmental friendly perception is situated more in the middle. Some of the interviewed felt the metal-like coating, green colours and photoprint were more costly in its production, while others felt the inclusion of real oranges related it more to an actual orange farm and nature itself. A discrepancy of the design is how noticeable the silver coating is, a cue that could potentially have swayed opinions in regards of recyclability. What is most interesting though is how 25% of participants chose this design as their preferred purchase in store, citing a sense of familiarity. Design 7A felt more honest to the participants compared to others like design 2A, giving a closer association to its origin country. Several participants felt the design reminded them of something they already purchase today, as well as being clear and concise in what the product contains inside. Cues that express honesty and transparency resonated more in the interviews than flashy design cues.





## Notable trends from test A

While all participants had their own personal experience and interpretation of the different designs, some traits reoccurred throughout the test. Honesty, trust, and transparency were keywords echoed in the answers of several participants, with some answers being based on feelings of deception by the graphic design. One participant pointed to how the cardboard-like packaging of design 1A might be a glossy coat applied later to the carton. Others felt unsure of the imagery chosen in design 2A, citing how oranges are typically grown in warmer climates, not Norway. When asked about participants' interpretation of environmentally friendly graphic design, several answers included the phrase "honest design". One participant said it does not matter what you do to be more environmentally friendly, but rather how it is marketed. It's arguable this answer is a result of fatigue felt by greenwashing in products and media. Ricky Chan of Auckland University of Technology defines green purchasing as purchases made specifically due to the benefits it has towards the environment, in contrast with the more harmful effects seen in its competitors (Chan, 2001). Jako Volschenk explains how consumers who are worried for the environment are more attracted to green claims in products. However, the overwhelming amount of information available makes it difficult to decipher and spot deceptive green marketing claims (Volschenk et al, 2022). This deceptiveness can be seen as a reason to why so many participants chose to focus on transparency of production and marketing.



Figure 11: All mock-ups in test B was made by researcher Henrik Kongsli Gjerde

## Results from Interview B

### Acknowledgement of number of participants

An important acknowledgement of test B are the renders themselves. Design 2B is meant to combine the nature imagery with the silver packaging border seen in design 7B. However, whether participants were able to notice the silver shine in either design is not clear. This could potentially affect how participants see the packaging. Another important acknowledgement is the choice of interviewees. Like test A, the selection of participants does include people with experience in the field of design, however test B also incorporates the opinions of everyday consumers outside the design profession. One reason designers were the main participants in this study was to ensure a greater insight be provided. Sharing a similar viewpoint allows better understanding of terminology and how the participants see everyday life. A deeper meaning behind the participants answers is given (McCracken. 1988). However, this can potentially allow for biases and a skewed representation of reality. To avoid this, the latter half of test B included participants outside the design field, incorporating viewpoints from people presumably unfamiliar with the design process.

## Notable findings: Design 1B

Design 1B is similar to its variant utilized in test A, however, with the addition of the eco-friendly labels Rainforest Alliance and Fairtrade. Rainforest alliance is an NGO working with issues related to sustainability through social and market means, while Fairtrade ensures fair trades between workers in developing countries and consumers in western countries (Rainforest Alliance, 2023) (Meny, 2023). Overall, the test B participants answered similarly to participants in test A, with two notable exceptions. One participant ranked the design significantly lower, claiming the material used was wrong, and the producers were trying to be environmental in a deceptive way. Prior knowledge of the feel and texture of existing cartons played a big role in how they interpreted the presented mock-ups. Other participants acknowledge this material perception, ranking it instead amongst the highest. Another participant answered the use of eco-friendly labels convinced them the product was better to buy for environmental benefits. The cues of eco-labels seemed to influence certain participants, however, as shown in carton 2B, the labels used also mattered.





## Notable findings: Design 2B

The research done in the article for E&PDE2022 relied heavily on assumptions of different cues (Gjerde, 2022). An example is the metallic cue portrayed on one of the packaging. Since the Sunniva® Original orange juice 1 litre cartons are made of paper the metallic sheen was deliberately chosen to deceive participants confidence level regarding recyclability. Since participants knew to sort paper, plastic, and metal waste differently, the cue had an overall confusing and contradictory presentation. Most participants thereby believed the design to be the least recyclable, some even interpreting it as residual waste (Gjerde, 2022, pp.3-4). However, the confidence levels of cues often enhance each other when combined. As such, a part of the research's aim is to see if certain cues overpower others when combined. Nature-like imagery, simplistic- and paper designs were seemingly among what participants believed to be the most environmentally friendly (Gjerde, 2022, pp.4-5). This raises the question of what would happen if "environmental" cues were combined with "non-environmental" cues? Design 2B trials this theory by combining the nature imagery with a metallic border. Compared to its previous iteration, design 2B scored notably lower in the perceived environmental friendliness. Many participants referred to the excessive usage of ink utilized, similar to the feedback of design 2A, however, the addition of the silver border caused a further negative perception of sustainability for the design. While the border did not seem to have a positive effect on the perceived recyclability of the product, the design was still the most popular out of the participants' personal references. The focus of oranges on the packaging seemed to be an enhancing factor, with the nature imagery being the deciding factor. Design 2B also had the addition of the "Nyt Norge" label, being a requested cue from one test A participant. One person noted how oranges are not grown in Norway, thereby making this label deceptive. No one else of the volunteers mentioned this label, thought it might have indirectly had an underlying effect. Most people said 2B was their favourite due to the Norwegian nature imagery, even despite acknowledging how the design was less friendly to produce. One participant said, "2 and 7 are designed with a lot of ink used, and the silver colouring makes them seem like an even more extensive process to produce". The same participant chose design 2B among their favourites, as well as 4B due to the blue hues. Another participant said, "2B gives

me a feeling that the design is more focused on evoking nationalism rather than caring for the environment”, yet the participant still chose the design as their favourite.



## Notable findings: Design 3B

Design 3B is almost identical to its predecessor, but with the addition of the fairtrade symbol. The design scored slightly higher in perceived recyclability, with consensus being positive towards the design. Some people cited how the design felt more honest than design 1A or 1B in its material use. Simple colours and design, with merely one participant taking notice of the fairtrade label. While the design was not a huge favourite, the simplicity was vocally appreciated, describing it as rustic.





## Notable findings: Design 4B

Out of the 10 participants, 4 chose design 4B amongst their favourite choice to buy in store. Some claimed the highlighting of vitamin C made them more inclined to buy the juice, while the majority said the fresh colours was what attracted them to it. Some said the design gave an impression of tasty and sweet juice. In terms of perceived recyclability, the design caused an even split on both sides. While many participants ranked it lower because of the extensive use of different hues, some saw it as less costly since it excluded the use of gradients in its design. One participant ranked it the highest due to the inclusion of several labels on the front. However, the extent these labels are related to environmental causes differs. Notably, the Grønt Punkt logo does not mean the product is able to be recycled, but rather that the manufacturer has paid a fee to include the product in the recycling process to see if it can be recycled. Whether it is made of recyclable material is not determined by Grønt Punkt Norge (Renas, 2017). Representatives from Grønt Punkt Norge highlighted in a meeting how none of their designs contained their labels for recycling. These are labels meant to aid in recycling and handling of empty food packaging, which are unfortunately not present in this research, seeing as they are reserved for the sides of cartons. A notable point of feedback from two participants was how they interpreted the deviance from other Norwegian packaging designs. The participants stated the design evoked a feeling of a more modern design approach, claiming anything trendy-looking must be taking issues of the modern day into consideration. While this statement holds no merit as facts, it does underline how climate emissions and concern for the environment is often interpreted as a modern issue in the 21st century, and as such expected to be acknowledged in modern design solutions.

## Notable findings: Design 5B

For most participants design 5B ranked low due to the different graphic elements. The gradient, double strokes, two different base hues and additional background elements became too much for many. Overuse of these elements resulted in vast number of participants agreeing the design was targeted more towards children and a young demographic. It still received praise from 4 out of 10 participants, who had it as either their first or close second preference. The design seemed fresh and "juicy", reflecting the product inside. A reoccurring theme seemed to be how the participants wanted to be reminded of oranges and a reassurance of what they were buying.





## Notable findings: Design 6B

Design 6B was amongst the highest in terms of perceived environmental friendliness and recyclability. It scored just below design 1B and overall seemed more honest to the participants. Minimal ink and basic design gave an impression of resourcefulness and easy to recycle. One participant felt the design was a bit posh, but the majority felt the design was too lacking and plain. None of the volunteers chose the design as their favourite. While some participants preferred its simplicity in test A, the minimalism was too much, or too little, for the volunteers in test B. One participant stated the need for an enticing design even in a disposable product, despite the environmental benefits proposed by the volunteers of test B.

## Notable findings: Design 7B

Lastly, design 7B, caused an even split in terms of how participants saw the environmental friendliness and renewability of the product. What is interesting are the cues for why participants saw the design differently. The silver coating and heavy gradient caused a lower perception of renewability due to the extra production needed. However, real oranges utilized across the packaging evoked a positive feeling of the content inside. Like before, reinforcing and reassurance of what is inside the carton was important for the volunteers. This might seem like an obvious statement, though commercials often attempt to emphasize feelings rather than the actual product itself. Relating this to the study by Karin Wagner, the visual elements of the packaging cannot operate on their own, they are part of a visual hierarchy. Certain elements are more noticeable and contrasting than others than others. Hestad uses wine bottles as an example, describing the popping sound from a cork being pulled out of the bottle as an integrable part of the drinking experience (Wagner, 2015, pp. 203-204). In the case of 7A, 7B and 7C, the design was purposefully made to appear as a cheaper alternative. As such the design does not incorporate any abstract visuals of an orange. This in return had a positive effect, as the oranges incentivised the purchase of the juice. All participants who favoured design 7B stated it was due to the association with the actual fruit, as well as a sense of familiarity. The experience of drinking the orange juice needed to be enhanced by the ingredients shown on the outside of the carton. At least this is the impression the participants' answers suggests.





Figure 12: All mock-ups in test C was made by researcher Henrik Kongsli Gjerde

## Results from Interview C

### Acknowledgement of number of participants

Test A and B featured a total of 20 volunteers, 10 people for each test. However, test C only features 5 volunteers. This is mainly due to the designs of test C being mostly identical to that of test A, with the only outlier being design 2C. Originally design 2A featured imagery of the Norwegian Geirangerfjorden, meant to instil feelings of nationalism and familiarity within participants. Design 2C instead utilizes a photography of the Spanish beach Málaga, taken by William Justen de Vasconcellos (Vasconcellos, 2017). While the nationalistic imagery might evoke a sense of pride and familiarity in the volunteers, several participants acknowledged in test A that oranges are not grown in Norway, at least not on a larger scale. Thereby the photo in design 2C could potentially be seen as more honest, while still conveying an association of beautiful nature and fresh fruits. Since this is the only design different from test A, the number of participants has been halved.

## Notable findings: Design 1C

Design 1C received similar feedback as to that of design 1A, both in renewability and personal choice. Considering they are the same design the results can be summarized together. 15 out of the 20 participants saw design 1A/1C as the most renewable, with 4 participants putting it as the second or third most renewable option. Most notably, one participant mentioned the brown carton design made the juice feel locally sourced and healthier, being their personal preference.





## Notable findings: Design 2C

Design 2C was the only design different in test C from the previous iterations. However, it received similar perception of renewability and personal preferences as its predecessors. Environmental friendliness received a similar split as the previous designs, two participants mentioning how the tropical imagery made it look as if it had travelled far and an increased CO<sup>2</sup> emission. Another participant reinforced this statement, saying it gave associations to plane trips and larger emissions. Other participants put the design more in the middle, saying it felt like a standard juice. Two out of the six answers regarding personal preference stated the design looked fresh, colourful, and modern. The inclusion of oranges was also a deciding factor. The emphasis on the content inside the carton had a strong effect on participants, like previous answers from test A and B.

Figure 13: The image used on 2C is titled "just a sunny day in Malaga" (Vasconcellos, 2017)



## Notable findings: Design 3C

No notable statement was made about design 3C that had not been said in test A or B. One participant chose it as their favourite due to a simplistic design, while another participant felt the design was childish. Overall, the answers regarding recyclability put it in a middle point, tilting it slightly more towards a higher perceived environmental friendliness.





## Notable findings: Design 4C

Nothing particularly new was said about design 4C. Most notably, two participants said design 4C reminded them off cheap clothes or foreign, cheap juice they might buy on vacation. While the statement itself is somewhat vague, it does support the idea that Norwegians are more drawn towards product enforcing an idea of nationalistic high standard.

## Notable findings: Design 5C

Design 5C shares similar feedback as design 4C. Lot of different hues and somewhat of a foreign association put it lower in terms of perceived renewability. A single participant preferred this juice over the others due to the colours and orange slices. The same participant stated that design 6C was too simple and boring for their personal liking.





## Notable findings: Design 6C

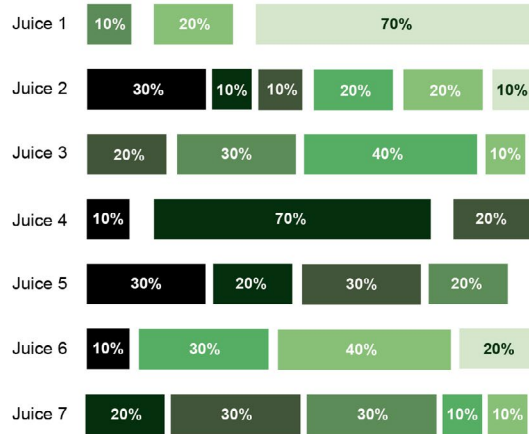
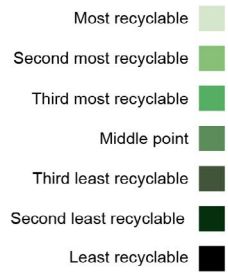
Design 6C received a split in how participants saw the environmental friendliness of the packaging. The reason for this though was due to a perceived sense of exclusivity and higher design philosophy. Two participants saw this as posh and more inconsiderate. If the company wanted to produce high class exclusive juice, they would not have the environment as a concern. Other participants stated the simplicity of the design attributed to an easier process of reusing the materials. Despite feelings of exclusivity and clean design, no participant wished to buy the juice in store. All participants remarked how the design was too simple, leaving little to almost no incentive to purchase the juice.

## Notable findings: Design 7C

The very last design, 7C, had a perfect split in which the volunteers' argument for and against the design's renewability. Some participants felt the visuals needed too many resources to make, others saw it as a standard Norwegian juice, and some felt the use of actual oranges enhanced its perceived environmental friendliness. The ladder was also a reason for one participant choosing it as their favourite. Again, imagery of the actual fruit enticed participants more to buy the juice.

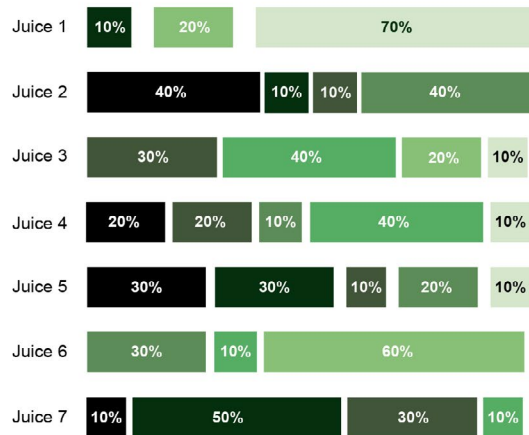
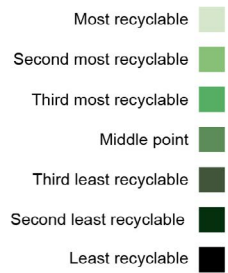


**Opinions regarding perceived recyclability - Test A**



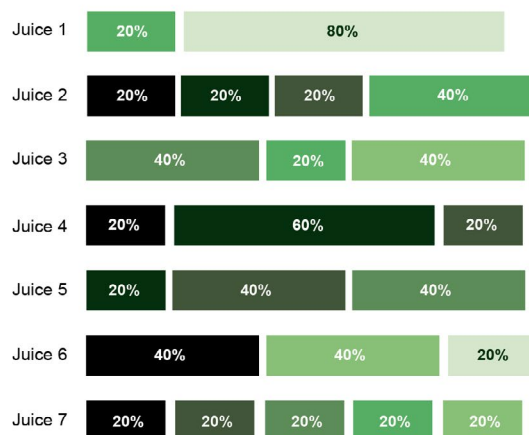
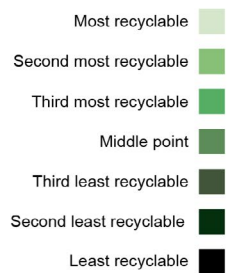
Tablet 1: Showing the participants opinions of the seven designs in test A

**Opinions regarding perceived recyclability - Test B**



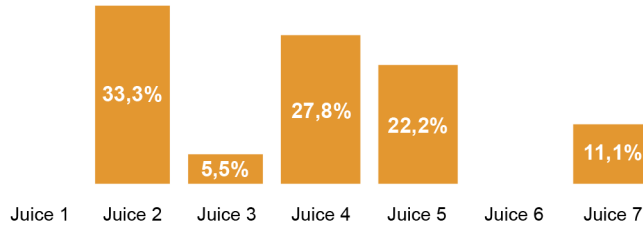
Tablet 2: Showing the participants opinions of the seven designs in test B

**Opinions regarding perceived recyclability - Test C**



Tablet 3: Showing the participants opinions of the seven designs in test C

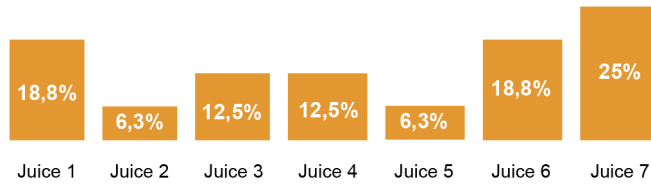
### The participants' personal preference (A)



Tablet 4: Showcasing participants personal preference in test A

Participants were allowed to choose multiple answers. In total there were 18 answers.

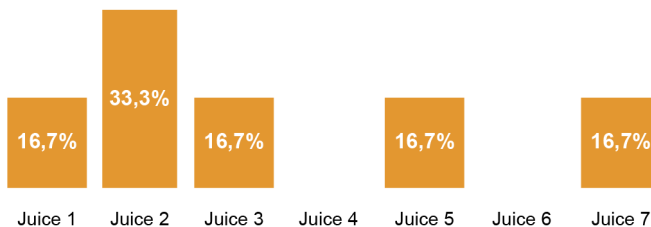
### The participants' personal preference (B)



Tablet 5: Showcasing participants personal preference in test B

Participants were allowed to choose multiple answers. In total there were 16 answers.

### The participants' personal preference (C)



Tablet 6: Showcasing participants personal preference in test C

Participants were allowed to choose multiple answers. In total there were 6 answers.



## Results from quantitative Facebook survey

### Acknowledgement of number of participants

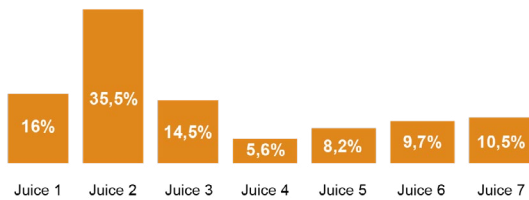
Additionally, to the qualitative responses from interviewing volunteers, this study is ultimately meant to be a mixed methodology research study that integrates quantitative research as well. In that regard there are shortcomings of the quantitative survey that needs acknowledgement. Initially the survey intended to have at least 200 participants voice their opinion in a short-four-answers google questionnaire about the different designs of Test A. The survey was shared through a Facebook post. However, due to a low reach and no prior Facebook engagement from the researcher's side, the total number of participants ended up as merely 69 participants. While there is still value in these answers, it is a significantly lower number of participants than wanted. Additionally, the volunteers were allowed to choose more than one answer for the different questions. This is the result of an oversight by the researcher, as the Google Forms did not make it clear the questions were multiple choice. However, this aligns more with the qualitative interviews, in which participants were allowed to choose multiple designs as their personal preference. As such the percentage of the survey has been manually calculated instead. Participants answered only what design they thought were least environmentally friendly, and which they thought was most environmentally friendly. As priorly mentioned this is again a limitation of google questionnaire. Another limitation could be the Norwegian language used, alienation those residing in Norway who do not speak Norwegian. The results from the quantitative survey reflected what was previously acknowledged in the qualitative interviews. As such, comparing the answers lends itself to the method of embedding the data. The idea being to nest the quantitative data inside the qualitative data to better enhance the findings (Leavy, 2017, pp.176 – 178). The questions asked are the following translated from Norwegian:



## Which of the 7 designs would you buy in store regardless of price?

### Personal preferences (124 answers)

A total of 124 answers were collected. Out of these, 44 participants (35,5%) answered that design 2A was their preferred choice of purchase. 20 participants (16,1%) answered 1A as their preference, and 18 participants (14,5%) answered 3A as their most enticing option. While the ladder might vary from the qualitative test, the preference of design 2A aligns well with its preference amongst the interview volunteers.

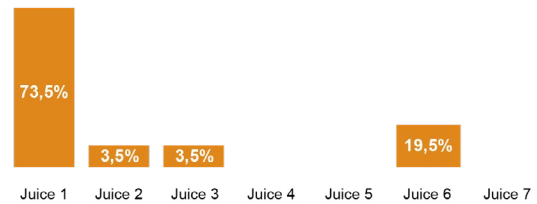


Tablet 7: Showcasing participants personal preference in the survey based of designs in test A

## Which of the 7 designs do you interpret as most enviornmentally friendly?

### Most environmentally friendly (87 answers)

Environmental perception of the design seemingly did not deviate from the previously provided answers of the qualitative interviews. A significant number of 64 answers (73,6%) favoured design 1A above others. Design 6A received 17 votes (19,5%) as the most sustainable option. Using prior knowledge from the interview, minimal print and carboard like packaging are likely factors why.

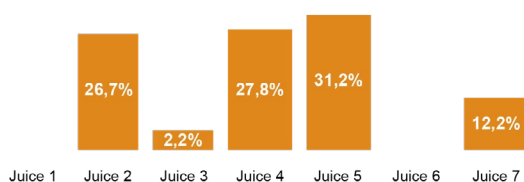


Tablet 9: Showcasing participants thoughts about the most enviornmentally friendly design in test A

## Which of the 7 designs do you interpret as least enviornmentally friendly?

### Least environmentally friendly (90 answers)

Answers for the least environmentally friendly design presented a larger variety of participant feedback. Three designs stood out. Design 2A received 24 votes (26,7 %), 4A had 25 votes (27,7 %), and design 5A received the most with 28 votes (31,1%). Interestingly this reflects the answers given in the qualitative interviews. The designs with the most excessive use of saturated colours and different hues scored lover in terms of renewability and environmental friendliness. Reflecting the interviews, the lesser environmental option did not align with personal preference. Design 2A was still the overwhelming favourite.

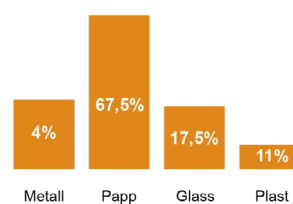


Tablet 8: Showcasing participants thoughts about the least enviornmentally friendly design in test A

## What material do you believe is the best to use for ease of recycling?

### Materials' renewability perception (74 answers)

The last question in the survey brought up the topic of physical materials. While this study is mainly about the perceived material and its perceived sustainability, it is worth questioning the volunteers on what they believe to be the most renewable material. In total, about 74 answers were gathered, in which 50 answers (67,6%) favoured carboard/carton packaging, with 13 answers (17,6%) choosing glass bottle. This reinforce a theory of paper being seen as the most renewable and sustainable material by consumers.



Tablet 10: Showcasing participants thoughts about what material is best for recycling (in norwegian)

# Notable findings from The interviews

## Colour and ink usage

Participants views of colours and ink use can be summarized as more print equals a lower perception of renewability and ability to be recycled. Lack of orange colouring mattered as the product presented was orange juice, thereby an obvious association was needed. Notably the addition of blue hues gave an image the impression of a more resource intensive production, but also complimented the juice in a way the participants described as fresh and trendy.

## Material perception

One of the most important cues for knowing how to recycle packaging is the perception of the material it is made of. Several participants stated design 1A, 1B and 1C would be recycled as paper due to the perception of cardboard material, which in return ranked it highest in terms of perceived renewability. For cartons this is a useful cue to utilize, unlike glossy metallic sheens that lowered the perception of renewability. However, while the perceived material enhanced the confidence the volunteers had in how to recycle the product, almost all participants would still recycle the cartons the same. A determining factor for this was the shaping. Familiarity of the shape made all participants certain it was made of paper, emphasising the important interaction the different cues play off each other. Material perception is especially important in odd or unusual shapes of packaging. This is reflected in the number of participants that said they would separate the plastic lid from the carton. The lid is made of the same material as the inside of the carton itself, and as such should be recycled together with the paper carton (Five, 2018). Milk producer TINE has acknowledged this in a new design that keeps the lid attached. This is an effort to prevent littering and plastic from being tossed into nature (TINE, 2022). Simply informing people about this material misconception could be helpful.

## Trust and greenwashing

Consumers do not want to feel cheated, and the answers given during the interviews confirms it. Deceptive materials and predatory sense of nationalism are two examples of the greenwashing participants felt exposed to during the research. Research in return shows that the more aware of greenwashing the consumer is the more will they look for it in store, such as hyperboles, exaggerations, and superlative green claims that are still legally permitted (Steenis, 2023, pp.163).

## Imagery and photography

Photography and images are cues that can benefit the predictive value in evoking associations of places and tying emotional moments to a product. However, the consumer's confidence value for the cue is decided by what specific depiction is chosen. During the research phase, the packaging of design 1A and 1B rated high among the participants' favourite designs. Several stated it was due to the sensation of nationalism and sense of familiarity with the Norwegian scenery depicted. Despite this, several participants felt sceptical to the designs due to the origins of the oranges. Testing the opposite theory by depicting beaches of Spain, the origin country of the oranges, resulted in the juice feeling as if it had travelled far and caused higher CO<sup>2</sup> emission. Photography of places and countries benefit if the origin of the product is the same as the ones depicted on the packaging. Otherwise, the consumer becomes suspicious of greenwashing. Using real life photography to depict ingredients on the packaging, such as oranges, benefitted the product. This was compared to hand drawn and abstract illustrations, a cue that lowered participants confidence value of the content inside. A known example is the Tropicana redesigns of 2009, in which consumers felt less attracted to the juice brand due to a complete redesign of the packa-

ging. One then most notable change was replacing the realistic image of an orange with a glass of orange juice instead, causing great confusion. Tropicana reverted to their old design after a 20% loss in sales at launch (Marion, 2022).

## Use of labels

A general summarization of labels on packagings would be that they relieved the consumers somewhat of guilt. Predictive values were high, as regardless of what label was utilized, except *Nyt Norge*, the participants felt the cue gave a sense of legitimacy for the production. *Nyt Norge* labels ties back to the feelings of nationalism and honesty. The other labels did not matter to much in their meaning, rather their mere inclusion left a positive impression. However, some volunteers stated that labels for how to recycle packaging would be the most useful. In the Norwegian food market these labels already exist, but are usually placed on the sides of the packaging. Difficult to determine materials could benefit from these labels in more visible areas. There is however also a dilemma of to what extent consumers care about recycling.

## Trendiness and youth

As mentioned in the last segment, an important question regarding recycling is to what extent the average person care about the topic. During the interviews, each participant was asked for their age. This was the only personal information extracted from the interview subjects, with the intention of finding any potential correlation between age and design cues. While most participants answers did not differentiate based on age, there were certain underlying cues that only flourished when interviewing students in their early 20s. These cues were heavily emotionally and presumptuously based. One participant noted that design 4B felt more environmentally friendly because of its trendy and unusual appearance. Two volunteers, aged 21, said design 4C felt worse for the environment due to feelings of cheap clothing and foreign production. While one could argue these responses contradict each other, it does raise the question of how younger generations view branding.

In a video posted to the Food Theorists YouTube channel, researcher Matthew Robert Patrick attempts to explain the reasoning for the logo rebranding of Pepsi in 2023. By researching

and dwelling into the history of Pepsi as a soda brand, Patrick explains the new logo is specifically trying to appeal to a younger demographic through nostalgia and subliminal messaging. An example is the use of black colouring for the can, previously blue, which is meant to be reminiscent of Pepsi Black which is a no sugar drink (Patrick, 2023, 11:30). Coca Cola also colours parts of their beverage containers black to symbolize no sugar. Patrick further elaborates the reasoning for this colour change is rooted in research showing younger generations preference for products containing less sugar. An article from Food Insight also referenced by Patrick states that 29% of 18–24-year-olds try to avoid sugar entirely (Paipongna, 2022). It can be argued about the irony of soda brands basing themselves around a no sugar strategy, however it does show the effect graphic design and underlying messaging means to consumers. Akin to the use of paper or metallic-like coating on the outside of the orange juice packaging.

# Utilizing the Research results

## Proposal by Grønt Punkt Norge

At the start of this master was a proposed thesis question of how cues in graphic design are perceived by consumers when put in the context of food packaging. Additionally, the question of how knowledge of these cues could be utilized was raised. During the spring semester of 2022 at OsloMet I attended an internship at Grønt Punkt Norge. A company responsible for collecting and recycling packaging from their member businesses. Shortly after I was introduced to the company, I was given the choice of one of three tasks to base my internship period around from February to May. The first option involved researching reasons why students would not sort their packaging waste, and the second option was about creating a campaign on social media to encourage recycling. For the internship period I combined these two options into one, creating a TikTok campaign for students based on feedback from qualitative interviews and quantitative surveys. However, the third option given by Grønt Punkt involved making a handbook for packaging companies explaining cues to utilize for better optimisation of their products renewability and environmental perception. A direct response the article written for E&PDE2022, which members of Grønt Punkt themselves had read. An option meant to approach businesses directly regarding issues of

recycling and the environment, reaching out to an important stakeholder of the system directly. Approaching a system like this is comparable to that of a slinky toy, in which the slinky moves due to the tension within itself and not because of the surface it interacts with. In a similar fashion, system theory provides insight of structure and how different components within it respond to each other (Meadows, 2008, pp. 3, 18-19). Rather than asking why consumers refuse to recycle, the insight from this research suggest a change at a higher level to battle consumer confusion. Analysing the Life Cycle Assessment (LCA) of the suggested solution, an assessment of resource efficiency and environmental impact of a product through its lifespan (Norsus, 2021), it becomes clear the end-of-life section and manufacture section are the most impacted. Results can alter the manufacturing of food packaging graphically and physically, which in return has an impact on the end-of-life of a product in encouraging recycling.

Originally this third option went unfulfilled in favour of combining the two other presented tasks. Although now, with the additional experience and research conducted for this master thesis, it is the proposal that the final delivery for this master fulfil the third option in the format of a handbook for packaging companies regarding cue utilisation.

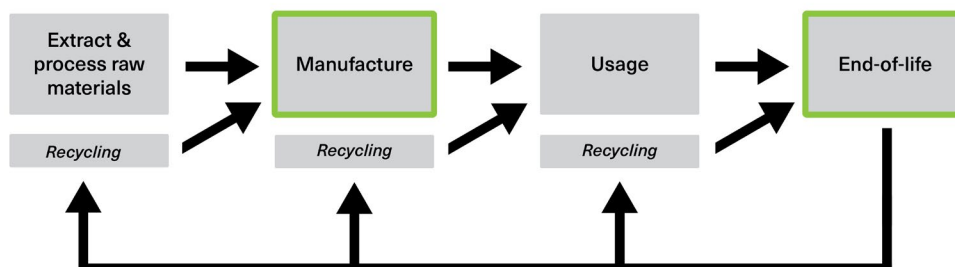


Figure 14: Life cycle assessment of a product/service. Main focus for the suggested solution is manufacture and end-of-life

## Inspiration for the handbook

While researching the original two proposals provided by Grønt Punkt Norge for my internship, I was advised to contact an advertising company for insight into how to advertise on social media. Provided in return was an extensive interactive PDF-document about the intricacies of TikTok as a social media platform. While this document cannot be referenced as it is confidential (personal communication, 31. March. 2022), the content provided inside served as an inspiration for this handbook. Similarly, this handbook is meant for packaging companies to utilize research for better strategically designing products that aid consumers in recycling, but also encouraging companies to be more honest with their own marketing and products.

## Acknowledgement of the handbook

While the handbook is based in both qualitative-, quantitative research and additional scientific sources, there needs to be acknowledged the number of participants could have been higher to give more varied answers and insight. Further development would seek a greater pool of volunteers. While this handbook is made in good faith, packaging companies themselves may abuse the findings for potential greenwashing of their products. This issue has been addressed in the handbook itself, and advice against greenwashing is given as a strategic form of marketing for packaging companies. With the current content of the handbook allows to later be expanded upon in its knowledge and presentation. What is currently provided is a base for what further research and insight could build upon, provided the interest by packaging companies.

Adhering to the cradle-to-cradle principle, the idea of creating new products that are useful as new resources even when the product itself cease to exist (Braungart, 2009, pp. 45), all the research done is ultimately encourage recycling and honest advertising. It does not research the use of new materials, and as such the carton fibres are worn down and finite in their use (Sortere, 2022). However, this study has its focus on the psychological and visual effects of packaging, and material composition in of itself goes beyond the reach of this thesis.

# Packaging cues & Handbook

The final delivery for my masters based of months of research culminates in the Handbook for visual renewability in packaging - 2023. Provided are reasonings and explanations for the different sections of the handbook. The handbook consists of a table of contents, introduction, the research behind the handbook, and different chapters talking about issues related to materials, colours, images, nature, and appealing to younger generations. Pictures and mock-ups used in the guide are all personal renders exported from Blender specifically for use in the handbook. The handbook in its current state was presented to Grønt Punkt Norge in a meeting on May 9. 2023. Intention for the meeting was a potential coalition to distribute the handbook amongst their members. In its current state, the handbook is more a proof of concept than a finished guide for businesses. The few presented pages are an excerpt from the current state of the handbook. However, what is presented gives an impression of the potential that can be built upon with additional knowledge.





# HANDBOOK FOR VISUAL RENEWABILITY IN PACKAGING

2023

Guide for manufacturers regarding cues in graphic design related to consumer perception of renewability and environmental awareness

## THE RESEARCH BEHIND THE GUIDE

The research for this guide was done in conjunction with a master thesis in product design at OsloMet. The main purpose being to see how different graphical cues effects the consumer in how they perceive renewability and environmental factors in conjunction with store products.

The research for this guide consists mainly of 25 qualitative interviews, 69 quantitative surveys as well as desktop research. The qualitative interviews are what this guide is mainly of around. The research for this guide is also a continuation of an article written and performed at the EPDE2022 conference.

This guide uses juice cartons in its examples, but advices given are applicable to other areas as well.

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# MATERIALS AND TEXTURE





# PERCEPTION OF MATERIAL

Paper-like packaging gives the impression of a more renewable packaging, allowing for the consumers to easily know how to later recycle the material.

However, if the coating outside appears as a different material than it's made of it will lower the trust of the product. Having a rough paper coating while the carton is glossy only makes the user suspicious.

If the texture and material do not match each other, the consumer might become wary and suspect acts of greenwashing.

**!** More aware the consumer is of Greenwashing, the less likely they are to purchase products they suspect take part in it



Many people don't know you can recycle the lid due to the different material

Minimal print and ink gives impression of environmental and resource consideration



The texture and look assists the consumer in determining the material and how to recycle it

The shape of the packaging often helps determining the material due to recognition. The outside can aid in how to deal with weird or oddly shaped packagings

# COATING ON THE CARTON

When researching, some participants started metallic and shiny coatings made them unsure of how to recycle the paper cartons. The texture and shine went against the perceived flat surface finish of cardboard

Certain participants in the research would recycle cartons as residual waste due to the look and coating applied to the outside. The feel and touch aids the consumer, but can also mislead or create uncertainty.

**!** Trust is important for both you and your consumers. Materials are felt, so be honest with what the carton is actually made of.



When applying the silver border to the other designs the perception of renewability decreased

A non-conventionally shaped packaging might cause confusion if the material is difficult to determine. The shape and feel are the things keeping it recognizable as paper



# UNKNOWN MATERIAL?

Many people are not aware the top lid on the carton can be recycled due to material. Informing about this can be helpful for the consumer and in building trust with them.

Since people are not aware the lid on top can be recycled, help them to recycle by **informing them** of how to.

Studies show that consumers are less willing to buy if they feel deceived, but by doing the opposite and informing them instead you create a more **trust and loyalty**

**!** If you want people to recycle, tell them how. This makes you seem more trustfull in return.

*A label on the carton can be enough to inform people on how to later dispose of the product*

*Place it near the lid itself so the person handling the carton can easily spot it*



# GREENWASHING AND TRUST

Most people believe all cartons to be recycled the same, but the brown paper outside does give a perception of renewabilty and eaiser handling.

However, wether the pacakging is better for the enviroment depends on if the brown paper is real or coating. The coating can be just as bad as any other application. This in return can be felt by your consumers, which if they are aware will lower their trust.

**!** People are more aware than ever of marketing strategies, as such honesty appeals more. People are less willing to buy if they suspect greenwashing

*During the research, one participant questioned if one packaging was better than the other if they are all coated in a plastic finish*



# MATT OR GLOSSY FINISHES?

During the research for this handbook, participants listed their interpretations of environmental friendly graphic design.

Some of these included minimal ink and **matt finishes**. Glossy finishes were a give away for possible greenwashing, which, would lower consumer trust and loyalty. Reinforced by another cue mentioned, **trust, genuinity and honesty**

Other cues mentioned included the colour green, minimal ink and simplistic design.

**!** Matt finishes gives people the impression of less resources being used, and in the case of carton emphasises the use and impression of paper



*Glossy finishes gives of the impression that the materials conflict, and in return lowers trust*

## TO SUMMARIZE

**!** Be honest about the materials, trying to portray it as something else will lower trust.

**!** If you want people to recycle, tell them how through helpful tips and clear packaging.

**!** Paper-like look encourage it to be recycled as paper and is a strong cue for aid in recycling. Glossy and metallic coatings make consumers unsure if applied to paper surfaces.



**!** Using less printing ink is often perceived as more resourceful, thereby more renewable.

**!** People are more aware than ever of marketing strategies, as such honesty appeals more.

**!** The more aware the consumer is of Greenwashing, the less likely they are to purchase any products they suspect take part in the act.

# Discussion

## Contacting professionals and companies

At the start of this master, I initially planned to contact Nigel Steenis about his article regarding sustainability perception through material usage. Finding relevant questions to ask seemed difficult, and over time the focus shifted to contacting recycling and packaging companies instead. In hindsight this is one of the biggest shortcomings of this master, seeing as Steenis published a highly relevant article a year prior to this master, later published in the Journal of Advertising in 2023. Contacting earlier about the research for this master could potentially have yielded useful insight from Steenis on the topic and his approach to researching. Despite this, the articles published by Steenis and his co-authors serves as support and solidity in the research for this article. An example is the confirmations that consumers' trust of a corporation or product decrease due to greenwashing, resulting in consumers penalizing companies for the perceived deceptiveness found in their products and marketing (Steenis, 2023, pp.160-161).

As for contacting packaging companies, most of them either did not respond or responded too late. There was an attempt to contact TINE about the subject of the master. Initially the company gave a response and said they would respond further if there was interest in the project, however, this did not happen (personal communication, 23. February. 2023). Furthermore Tetra Pak, a Swedish packaging producer, was contacted through email for questions about sustainable packaging and consumer responses. After two and a half months the company responded. A seemingly auto generated response was given, or at least based off a templet. It encouraged to check out Tetra Pak's website for any questions about sustainability, with a link attached in the email. An error occurred when accessing the link on multiple devices, saying that the link could not be found (personal communication, 4. May. 2023).

Despite several failed attempts at contacting different packaging companies, Grønt Punkt Norge responded about a month later.

On Tuesday May 9. Representatives of the communication department from Grønt Punkt Norge allowed for a meeting to showcase the research done for this master article. After explaining the process of gathering the data, the mock ups, and a walkthrough of the handbook so far, the representatives of Grønt Punkt suggested a potential coalition of sharing the finished master thesis with their members. A suggestion of sharing the handbook as initially intended was brought up, however this would need a potential remaking or readthrough by Grønt Punkt Norge first. The remake would include a potential replacement of the Sunniva brand name, as to not create any unwanted connotations to TINE and the Sunniva brand (personal communication, 9. May. 2023). However, this change cannot be done for this master article, as all 25 participants from the qualitative interviews answered regarding mock-ups that depicted the Sunniva brand specifically. Changing the name this far into the research process would be dishonest and false according to the answers of the volunteers. This change would potentially be reserved for a future version of the handbook, unrelated to the master.

## Language and target group

As a graphic designer the use and portrayal of language is essential in design, and as such is important to acknowledge the shortcomings of its utilization in this study. Hierarchy has been explored and taken advantage of all throughout the mock-ups for the study. Certain texts have been deemed more important in size, the choice of typeface, colours, and this has all been altered through each design to study and research the different effects it had on the participants. However, the language itself has stayed unchanged from each design and its variations. As the main purpose of this research was to study the graphical alternatives based of the Sunniva® Original orange juice 1 litre cartonm this was a conscious decision. Although, the language utilized in a lot of advertisements is often the most deceptive part. In 2020 An advertise-

ment campaign by Burger King was launched focusing on the Rebel Whopper burger, with the slogan "100% whopper, 0% beef". This use of language lead many to believe the burger was vegan friendly, which it was not due to the preparation of the burger being done next to other meat products (Handley, 2020). Such focus on language and wording is not present in this study. Seeing this from an opportunistic perspective though, this is an area of interest that could potentially be further expanded upon in the handbook, provided more research be done.

As part of the autumn semester 2022 at OsloMet for master in product design, Technology and Design course under supervision by Nenad Pavel allowed the exploration on the topic of greenwashing and advertising. The intention was to explore to what degree the average participant were able to separate real language utilized in actual advertisements versus the language and imagery utilized in fake advertisements made by researcher Henrik Kongsli Gjerde. Fake adverts were made using illustrator and other photo editing tools, for then to showcase them to vlonuteers side by side with real advertisements utilized by fast food companies. Ultimately the results showcased a clear conflict in the participants ability to separate the real adverts from the fake, with an even split of 50% in the legitimacy of both the real and fake advertisements in some cases (Gjerde, 2022). What this study demonstrates is a clear inability to separate satirical language from real ones, and to understand when and in what ways greenwashing is used. As such, the argument is to be made that results and findings from this study should not be restricted to packaging companies alone, but also available publicly as a tool for awareness against greenwashing. One example are posters to inform of the intricacy of greenwashing and different tactics. More awareness amongst people themselves is a way of preventing the spread of misinformation, as well as raising critical thinking towards advertisement. Similar posters could also be utilized in a company's workspace to encourage more ethical work standards, focusing more trust rather than marketing preying on ignorance.

## Ethics of the handbook

Aforementioned in this thesis is the strategic redesign of the Pepsi soda can to be perceived healthier through the packaging's colouring choice, despite soda being a sugary drink (Patrick, 2023, 11:30). While not stated directly

in the handbook itself, one of its purposes is to encourage honesty and better practices for companies. Hence why certain strategies involve encouraging change that is beneficial to the companies, rather than out of moral obligations. In the book *The Business Ethics Workshop* the author James Brusseau references a scene from the movie *A Civil Action*. In the scene, John Travolta's character is a lawyer speeding to investigate a toxic spill that has infected a town's water supply. Travolta's character is stopped and receives a ticket for speeding before he continues onward to see if there is any monetary gain from launching a lawsuit against the toxic waste's company. Brusseau argues that a key message in the movie is about how companies, and greedy lawyers, can only have their unethical behaviours altered through monetary penalties or gains. While a pessimistic view, Brusseau further argues that companies should have a sense of social responsibility, focusing on ethics and not just profits. (Brusseau, 2011, pp.589). Pepsi's rebranding demonstrates the cunningness and deceptive marketing that can be done by through marketing by big companies. Hence the intention of the handbook was to demonstrate cues and strategic to appeal to the consumers' sense of ethics, while simultaneously encouraging the production of packaging more honest and helpful to the average consumers. In terms of LCA, it is debatable how great of an effect the handbook actually has on the manufacturing process. Despite this, convincing corporations that honest marketing will in the long term be profitable is beneficial for both packaging companies and consumers.

## EU-laws and new regulations

Packaging companies might not comply to findings of environmental perception as they instead focus on their own image and identity, as well as profits. In this scenario there is another factor to consider, official EU-laws. In 2023 the European Union proposed a green claims directive to combat the use of greenwashing and its effect in products and advertising. Proposed are "detailed rules on the substantiation, communication and verification of voluntary environmental claims and environmental labels used by traders that market products to EU consumers" (Forwood et al., 2023). The law would complement an amendment made towards the Unfair Practices Directive and the Consumer Rights Directive in 2022, all with the intention of broadening the definition of misin-

formation, thereby decreasing the spread of it (Forwood et al., 2023). While this is merely a proposal still under approval, it does open for the need of corporations to readjust less than honest marketing strategies. A more honest marketing philosophy and visual design akin to the ones presented in this thesis would thereby be more fitting. If not for the purpose of more honest marketing, then at least to comply with European laws. It is necessary to mention that while Norway is not a member country of the EU there is a compliance to EU-laws through the EØS-agreement, beneficial to sell goods and services within EU borders (Stortinget, 2023).

## Mock-ups instead of physical

A recurring question from different supervisors and acquaintances alike is why physical models were not utilized instead of 3D-renders. Initially this was justified as all cartons were meant to be made of the same material with only visual changes to them. However, whether the participants would feel the same way about the cartons having them in hand is uncertain. It is acknowledged the discrepancy of not making physical copies of the cartons at the start of this thesis. As such, two test prints were made utilizing a plotter machine at OsloMet and empty Sunniva juice cartons. Printed decals were applied to the juice cartons as a low-fi mock-up. Given more time these mock-ups could potentially have been made by local printing companies. The plotter could also have been utilized; however, both these options would require for other designing other surfaces of the cartons to be believable. Potentially this would allow to study how participants interacted with all surfaces of the cartons. An example being how labels for recycling are usually placed on the sides of milk/juice cartons in Norway. As such, this study ultimately leans more into the surface impression given by the designs.

*To the right, a physical mock-up made using a plotter print and empty juice cartons. Lack of resources made these mock-ups less convincing, and as such was dropped*



# Conclusion

Returning to the research thesis presented in the introductory segment of this article:

**How does cues in graphic design affect the perceived sustainability and environmental perception of food packaging, and how can knowledge of these cues be utilized in both harmful or positive ways towards consumers?**

It can be summarized that cues have a definitive subconscious effect on perceived recyclability and environmental awareness. However, cues' effects are not isolated from each other and do play together in creating an overall experience of a product. Cardboard-like cues are good for signaling a packaging is meant to be recycled as paper, though may be deceptive if other cues contradict these cues such as glossy finishes or metallic borders. Certain traits of renewability were common and often repeated, and as such are highlighted in this article. A few examples being trust, familiarity, nationalism, hues, shape, and consumer knowledge of greenwashing. In this regard, familiarity with similar products plays a significance in how consumers perceive them. Knowledge of these cues can be used in the favour of consumers, aiding them through recycling unknown material or focusing on the interaction design of handling food packaging. In terms of harmful effects, lack of knowledge about certain cues can cause consumers to become victims of greenwashing. Combating this is possible through convincing companies of more honest marketing strategies, as well as official sanctions and a need to conform with greenwashing laws. Results and insight gained from this research can be utilized in both making better products for consumers, but also inform of potential marketing strategies that prey on ignorance or deceptive presentation. Language is an area this article does not dive deep into, and as such is its greatest weakness. Lack of real mock-ups is another absent area that would allow for more realistic handling of a product, though sadly neither is present in this article. Potential for expanding this research can be done through new mock-ups and utilizing the

knowledge from the qualitative interviews. While there are many areas of interest left untouched or with limited research, the provided results still give insight into how consumers perceive visual elements on packaging and what cues are deemed most important. It also provides insight into what consumers prioritize else than the environmental benefits, such as trust. Cues found in graphic design have a definitive effect on consumers perceived perception of sustainability, but consumers scepticism to modern marketing may aid them in the face of greenwashing and deception. This study opens the discussion for other areas of marketing and visual language to be studied as well.



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# LIST OF FIGURES

*Any design or figure not listed was made by researcher Henrik Kongsli Gjerde*

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