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The Impact of Lighting Type on Consumer Behavior in the Purchase of Healthy Products

By
Sarah Hartmann

Under the mentorship of Professor Sarah Zenti

Abstract

This project explored how lighting in the produce section of a supermarket can influence a consumer's decision to purchase healthier options. There is research in this field that examines this idea in restaurants, however, this specific area has not been researched. For this study subjects participated in a pre survey, viewed renderings, and took a post survey all at one predetermined time. The estimated time for the completion of this was about 20 minutes, but this time varied between subjects based on how long they spent taking the surveys and viewing the models. The surveys determined correlation between lighting and consumers preferences and were used in the results section of my thesis.

Thesis Mentor:_____
Professor. Sarah Zenti

Honors Director:_____
Dr. Steven Engel

Acknowledgements

I would like to express my gratitude to several people that have supported and advised me throughout the entirety of this project. Without their encouragement and support throughout this process, writing and completing this thesis would have a more daunting task. Knowing that professors, family, and peers all were willing to help in any way they could, made these years of work worth it even more.

First, I need to give a huge thank you to my mentor, Professor Sarah Zenti. We have met and worked on my thesis many times throughout the year and a half in which I have been developing the process and project. She has offered valuable suggestions, edits, and endless support in my work, for both this thesis and other projects. Our meetings would often get off topic, often involving food and just about anything else, which is one of the reasons why I looked forward to our meetings every week because I always left feeling positive and productive. She has been a key part in my success of this thesis and throughout my college career.

Second, I need to thank Dr. Trent Maurer for the continuous support every week in class, hours spent reading over my work to ensure I had comments and suggestions to improve my thesis, and for the positive words of support and encouragement from the beginning. He has always offered his support and extended additional help outside of class amongst his busy schedule. From first meeting him in regard to what the Honors Program was and the requirements involved, to our last class day, he has always expressed how excited he was to be

working with us and was sometimes more excited about my thesis than me at times. I would not be where I am today without him, and maybe not even in the honors program.

My peers in the Honors Program, Katherine Price, Kelly Lesh, and Hannah Smith, have worked alongside me on their own amazing projects and offered support and suggestions even while struggling with their own work, for which I cannot thank them enough. Our shared work ethic and desire to put out only the best work, pushed and challenged me to improve and reflect upon my own work in my thesis and all other school projects. They have made me laugh, cry, and realize how grateful I am to have had the privilege to have been on this journey with them.

Lastly, I must thank my family and friends who have listened to my thesis many times and always offered support and words of encouragement when I needed it most. My parents have always pushed me to step outside of my comfort zone and never give up even when I thought I could not do something. They have supported me in all aspects throughout this process and my entire college career which I will be forever grateful for. My friends also offered endless support when needed, making me laugh and smile throughout the process.

This thesis has been a challenge; requiring adjustments, questioning my own hypothesis, and a general lack of motivation at times. I cannot begin to express how much I appreciate the work, support, and time all these people have put into helping me in various ways to make this thesis what it is today. All I can say is thank you everyone, thank you for everything.

Introduction

This topic will explore how supermarkets can effectively use lighting to positively influence buying habits of consumers to purchase more produce and healthier food options. This project explored how lighting in the produce section of a supermarket influences a consumer's decision to purchase produce. There is research in this field that examines this theory in restaurants, however, this specific area has not been researched and needs more testing to determine any correlation between lighting in a produce section and people preferences . This project involves participants taking a pre-survey that assesses their preferences on what they buy while shopping, how often they shop, and other questions based on their specific shopping habits. Participants then viewed renderings of three models and answered a post survey based on their preferences and reactions to each space.

One of my research articles states "In terms of consumer well-being, dining in brightly lit ambient settings might be a good option if the goal is to enhance choice likelihood for healthy options." (Biswas, Szocs, Chacko & Wansink, 2017, p. 2) which if used correctly, could influence healthier shopping among individuals when used in a supermarket setting. People could be indirectly influenced to stay in a certain area of a store longer, therefore the potential of them purchasing products, in this case, produce more frequently. The issue of obesity is currently a global concern, so if large influential stores such as Walmart and Whole Foods could invest in lighting techniques in certain sections of the store, they would have a stronger potential to encourage healthy eating. Some of my research concludes "Food retailers, in particular at supermarkets, are key shapers of the food environment which influences consumers' diets" (Martinez, Rodriguez, Mercurio, Bragg & Elbel, 2018, p. 1) which means if lighting can help

change consumer's choices positively without them being aware, then this is an important topic to research further. Lighting also has been a proven method to set a specific mood or feeling in a space, which can subconsciously influence an individual to stay in a space longer which can lead to more purchases. Utilizing a designer's knowledge of lighting in this way can expand this often-unacknowledged field and area of design and construction that people often do not pay attention to or consider the level of impact it has on daily consumers. This study shows how important lighting is in terms of consumers behaviors and shopping habits and that people are making purchases because of how they feel in the store, along with how long they stay.

Literature Review

According to Martinez et al. (2018) "Food retailers, in particular at supermarkets, are key shapers of the food environment which influences consumers' diets." which means that if more factors such as lighting can be researched and demonstrated to play a substantial part in consumers' decision making process, designers can influence people to make purchases that are better for them and the environment. These topics are generally concerns in today's society and are a main reason why this is an important issue to explore. With popular topics involved in this study, the potential for public interest increases and allows more people to be interested and be able to relate to what this research.. This study also aids in the exploration of lighting as a solution to some of these issues which continuously are observed in our society. Lighting influences consumers in more ways than people think, whether it be through buying healthier options in a produce section or subconsciously staying in that section for longer, potentially leading to buying more produce, which will be determined later in my research.

Being able to understand and design spaces that will influence people to purchase products that are better for them will improve people's health and increase profits in stores since some healthier options are more expensive than other products. One of my sources explains how "Process evidence shows that mental alertness mediates the effects of ambient light on food choices and calories purchased" (Biswas, Szocs, Chacko & Wansink, 2017, p. 3) which suggests that lighting does affect our buying habits in some way. Lighting that is brighter for instance, is often linked with mental alertness, therefore making consumers more aware of what they are purchasing while in a restaurant. or out shopping as my research aims to suggest. Exploring this topic will increase designers and builders' awareness on how lighting is a necessary part of creating spaces that promote the sales of products that have positive effects on people. This new knowledge will also expand this area of design and further show why it is important to consider when constructing these spaces.

Research studying scent, lighting, and music determined that "Specifically, lighting does influence longer stay in the supermarket, but does not influence the amount of money spent in the store and the purchasing of an increased number of goods. However, the conclusion determined that "a study that will enlarge the scope of study in investigating how store-environment affects consumer behaviour is needed"(Abimnwi, & Njuguna, 2015). although this study does not conclude a result that my research will investigate, it does call out a need for more research in this field. A graph depicted in this article clearly shows lighting contributing to a consumer's emotion which leads to their behavior in the store. The examples listed include, liking the store, time and money spent there, and number of items bought. Another research article makes a slightly different conclusion based on a study in an airport and the

amount of time and money people spend in the retail stores. The research concluded that "The

design and ambience of high arousal, time pressured retail environments have an impact on

spending levels, and therefore require the attention of operators and designers of the facility and

stores." (Bohl, 2014, p. 22) with this knowledge further conclusions can be made that lighting

and the environment influences consumers in some way and how our profession, specifically

noted in the prior quote, can affect and help reach desired sale requirements and overall

enjoyment and time spent in a specific space. The setup and design of a retail space is also very

important when understanding how consumers shop and behave in that environment. The gaps in

knowledge here in relation to lighting specifically in a produce section, further supports why this

topic needs to be studied.

     With research primarily focused on lighting in a produce section, the effects and benefits

can be determined and seen in what is found in consumers' shopping carts. The results from one

of my sources shows that the "mere element of lighting can be employed to change the

atmosphere within a commercial environment and to help to create a specific store experience"

(Quartier, Vanrie & Cleempoel, 2014, p. 2).   This tells us that the topic can greatly impact the

success of a store. If the environment of a store is tailored to mimic positive findings in research,

then the feeling associated with shopping in that store will be positive, thus potentially

encouraging and promoting specific more desired shopping habits.

     Results also tell us that the placement of the product is important in determining how

much of it sells and how "the most commonly used healthy food placement strategies included

placing fruits and vegetables near the front of the store or by an entrance, at eye level, or on end

caps" (Martinez, Rodriguez, Mercurio, Bragg & Elbel, 2018, p. 6) meaning that consumers pay

attention to different design elements while shopping and when connected with this source's

primary topic, obesity, aspects can be changed to change buyers' habitats. This information also

shows that stores are aware of the influence that they can and do have over shoppers. Some

stores, such as Whole Foods, are just doing a more adequate job of instilling these design

features in their stores when compared to similar supermarkets. With research pointing out that

when prompted about their shopping experience, consumers can make specific comments and

suggestions about the space, therefore confirming that elements in a store can provoke negative

and positive feelings and actions from people.

Bruggen explains how "research has demonstrated that customer response is influenced

by individual servicescape parameters, such as color or lighting (e.g., Areni and Kim 1994;

Crowley 1993), as well as more abstract store characteristics, including store design and

ambience (e.g., Baker et al. 2002)."(Brüggen, Foubert & Gremler, 2011, p. 71) which coincides

with evidence and studies developed and tested by other researchers. One of these being how the

design of a store involves many elements and the "Lighting is used not only to illuminate but

also to influence consumer attitudes and behaviors" (Otterbring, Löfgren & Lestelius, 2014, p. 4)

and with this statement in mind, changing the way consumers shop using lighting is attainable

and would be useful. Researching this topic could put more pressure on supermarkets to consider

how much influence their stores' atmosphere really has on shoppers. This could lead to an

increase in stores seeking more lighting designers to spend more time in planning the lighting

used areas of the store and not seem as much as an afterthought. Stores also may unknowingly be

the initial starting place for food trends as well. If this is true, then they could advertise healthier

options or foods recognized as a part of certain diets such as vegan or gluten free, which in some

cases are better for the environment. This then leads into another topic of concern today which is the increasing concern of the well-being of the environment. These are some of the main reasons why exploring this topic is important and how consumers, the Interior Design profession, and the environment could all benefit from research on this topic.

Research Questions/Hypotheses

According to a study by the CDC and published in "The Guardian", "Only one in 10 Americans eats enough fruits and vegetables." which is not a high number considering how much eating healthy is promoted in today's society (Glenza, 2017). The results from this study can help inform the design of supermarkets as owners and designers consider how much influence the stores' atmosphere, specifically lighting, has on customers and their healthy shopping habits. This research will seek to explain how lighting plays an important part in consumers' decision-making process when it comes to purchasing fresh, healthy produce. The research will also seek to demonstrate how important the role of the designer can be to influence people to make purchases that are better for them. This study will seek to demonstrate the impact of interior design, specifically lighting design, can have on encouraging customers to make healthier decisions while shopping, thus leading to increased well-being and a healthier lifestyle for themselves and their families. I hypothesize that consumers shopping in the produce section at a supermarket will select healthier options and possibly more produce when the lighting is brighter or adjusted to a certain warmth, color temperature, or number of lumens produced by the fixture itself.

Methods

Sample and Participant Selection

For the recruitment process friends and peers were asked to participate and all subjects participated voluntarily. A range of majors were surveyed and included interior design, fashion and history majors. Sixty percent of participants were interior design majors and the remainder were a mix of other disciplines. There were a total of 20 participants in the surveys: 16 females and 4 males. The age range of the participants started at 20 as the youngest age and 31 being the highest age. All participants were Georgia Southern students and are the main e demographic for the university.. The participants all agreed to the informed consent and completed the process in its entirety.

Assessments and Measures

The first set of surveys determined shoppers' habits while on their weekly shopping trips along with an estimate of how much money they spend on produce and the average amount of produce purchased per shopper. This data helped compile consumer profiles in terms of how they shop and what their shopping preferences are. After completing this survey, subjects viewed three renderings of produce sections with different lighting fixtures and settings applied to each. The post survey was entirely made up of free responses to allow subjects to give detailed descriptions of each model and to have more personalized data to review. The post survey asked participants about each model and determined which model they would want to shop and stay in the longest amongst. Additional questions were asked that would further help answer the initial research question. The appendices include the surveys participants were administered.

Procedure

Students were asked to participate in the surveys that were administered at a single

predetermined time over the course of four days in room 3026 on the 3rd floor of the

Interdisciplinary Building on Georgia Southern University. The researcher conducted a

pre-survey inquiring about the participants' shopping habits including questions regarding the

amount of produce they buy per week and their approval of their primary store's selection.

Participants were then introduced to photorealistic renderings of three grocery produce sections

with various lighting displays. Following the simulation, participants completed a post survey

that asked them questions about their experience with the renderings and any lighting (or design)

preferences seen in the models. The surveys were conducted using a Qualtrics survey and the

data was collected and evaluated, and the result will be determined using graphs and detailed

descriptions of the consensus of each model and the initial research question. The results were

evaluated and compared with prior research and former predictions concerning this study. A

conclusion was drawn from this information and will be discussed qualitatively and

quantitatively in the results section of the research paper.

Results

Using Qualtrics, the surveys were administered to 20 participants. The pre-surveys

determined that 40% of participants purchase 3-4 produce items each time they shop. The bar

graph below depicts this information and shows that a high percentage also regularly purchase

5-6 items from the produce section per shopping visit. Of the participants, 95% of them said

they would buy at least 1 produce item each time they shop with 80% stating they purchase 3 or
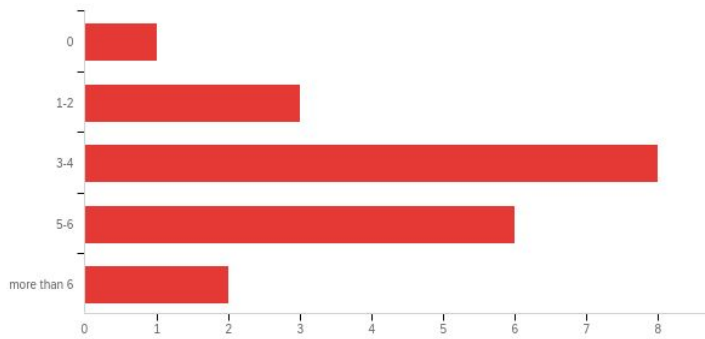
more items.

Figure 1. Produce Purchased per Shopping Trip

Of the participants, 75% stated that they shop once a week, therefore they have a higher likelihood of purchasing an item from the produce section without considering the lighting at this point, since they plan to be shopping anyways. The pre surveys determined the shopper's budget for buying produce on most trips to the grocery store. Of those surveyed 55% stated they were moderately satisfied with their preferred grocery store, which leads to the question of what could be changed to improve their shopping experience; in this case lighting could be the missing element needed as this research explores.

When questioned, 55% of participants said that they always buy produce when they shop when asked how often they bought produce specifically when they shopped, which indicates a high volume of consumers visiting the produce section of their desired supermarket per week. This data determining the number of visits per week was previously stated above, and when cross examined with the amount of produce bought, concludes that many of the participants surveyed will shop and buy produce at least once a week. In terms of staying in a space longer the bar graph below depicts that of the 20 participants 75% of them would prefer to stay in model 2 the longest. This supports previous research that determined lighting that was dimmer or at a lower color temperature would result in consumers unconsciously staying longer in that space,

thus leading to more purchases such as drinks and dessert. In this case, theoretically more

produce would be purchased as a result of the extended stay of consumers in the space.
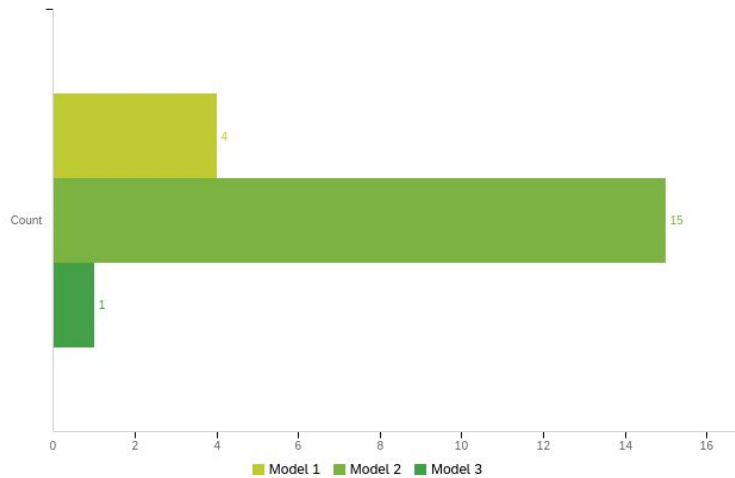

Figure 2. Shoppers' Preference for Longer Stay

The images below are renderings that the participants viewed of each space after

completing the pre-survey. Each one is labeled for which model it represents.

Model 1

Model 2

Model 3

The first model used LED lighting with a higher color temperature around 6000k and lumen level. This harsh lighting was approved by some subjects because of the ability to determine the freshness of the produce, while others did not appreciate the harsh and forceful lighting. The second model was also an LED fixture with a lower color temperature of 2400k thus creating a warmer and dimmer atmosphere. Many subjects described this as a "farm to table experience" because of these settings. The third model used a fluorescent light set on a medium color temperature of about 2800k and lumen level. The consensus of this model amongst

participants was not favorable to space at all. Subjects felt the space was green and that the

produce looked old and that they would get sick from eating it. Thus far people would shop in

model two longer, but overall appreciate the ability to see the product in a brighter setting as

displayed in model one.

When asked, "Did any of the lighting in the models make you feel more alert? If so,

which one and why?", almost 100% of subjects recognized that model 1 established a sense of

alertness. This is linked to a higher percentage of buying healthier items and based on the results,

subjects mainly claimed they would be eager to leave the space as quickly as possible because of

the harsh lighting, however some stated that they liked being able to observe the produce and

seeing that the produce was fresh and colorful while the other models cast more shadows on the

selections, therefore making it harder for consumers to see if the produce was fresh. Some

participants also said the produce looked moldy and old in both model 2 and 3 and that they

would not feel comfortable buying from either of those produce sections. The overall results

were mixed, however, they reflected research collected and discussed in the literature review.

Discussion

The hypothesis for this project in the beginning was stated as "Consumers shopping in

the produce section at a supermarket will select healthier options or more produce when the

lighting is brighter or adjusted to a certain warmth." Through the research and results stated

above, consumers were more drawn to and likely to purchase produce from the models with

either the lighting set at a higher color temperature and LED lighting or the warmer lighting that

also was a LED fixture with a color temperature set to closer to 2500K. This number is found on

the Kelvin scale, which can range from 1,000K through 10,000K and above. The lower the

number the warmer or red and yellow coloring the light fixture will exhibit. The higher the

number the brighter or white or blue color the fixture will exhibit. One participant directly stated

that "Model one has the best looking produce and looks fresh and the most nutritious on the

shelves, two has the best lighting for the experience overall, and three would be the one I would

find myself buying the least amount of produce from. Not that there's anything wrong with it, but

it doesn't look good on the shelf whatsoever." Many participants noted that the warmer lighting

in model 2 reflected a "farm to table" concept. One participant explained that "This simulation

has shown me how lighting can truly affect my preference in shopping for food, as well as the

psychological inclination I have towards particular colors and the intensity of those colors.

During this simulation, I truly analyzed all parts of a space and noticed small differences in

regard to lighting, lighting fixtures, and the effects lighting can have on the colors of different

foods and produce."

Another statistic surveyed found that 55% of participants were moderately satisfied with

their preferred grocery store. This leads to the question of what could be improved to positively

influence their shopping experience. Lighting is most definitely an element used to influence

shoppers with research stating that "The design and ambience of high arousal, time pressured

retail environments have an impact on spending levels, and therefore require the attention of

operators and designers of the facility and stores." (Bohl, 2014, p. 22). With this knowledge

further conclusions can be made that lighting and the environment influences consumers in some

way and how our profession, specifically noted in the prior quote, can affect and help reach

desired sale requirements and overall enjoyment and time spent in a specific space. The setup

and design of a retail space is also very important when understanding how consumers shop and behave in that environment. According to Quartier, et. al (2014) that the "mere element of lighting can be employed to change the atmosphere within a commercial environment and to help to create a specific store experience." This tells us that the topic can greatly impact the success of a store. If the environment of a store is tailored to mimic positive findings in research, then the feeling associated with shopping in that store will be positive, thus potentially encouraging and promoting desired shopping habits.

Participants' reaction to the brighter lighting in model 1 also reflected research that determined "In terms of consumer well-being, dining in brightly lit ambient settings might be a good option if the goal is to enhance choice likelihood for healthy options." (Biswas, Szocs, Chacko & Wansink, 2017, p. 2) which if used correctly, could influence healthier shopping among individuals when used in a supermarket setting. The concept of mental alertness can be further backed up by research which explains how "Process evidence shows that mental alertness mediates the effects of ambient light on food choices and calories purchased" (Biswas, Szocs, Chacko & Wansink, 2017, p. 3) which suggests that lighting does affect our buying habits in some way. Exploring this topic will increase designers and builders' awareness on how lighting is a necessary part of creating spaces that promote the sales of products that have positive effects on people.

Another subject determined that "This simulation has shown me how lighting can truly affect my preference in shopping for food, as well as the psychological inclination I have towards particular colors and the intensity of those colors. During this simulation, I truly analyzed all parts of a space and noticed small differences regarding lighting, lighting fixtures,

and the effects lighting can have on the colors of different foods and produce." With this in mind

and research that states the "mere element of lighting can be employed to change the atmosphere

within a commercial environment and to help to create a specific store experience" (Quartier,

Vanrie & Cleempoel, 2014, p. 2) which is a main point of this research; that people have

opinions and preferences of lighting and that these preferences can help a store in terms of sales

and affect what consumers purchase.

Reflective Critique

When I first began this thesis, I did not have the knowledge that I have now on my topic.

Throughout this project I have learned the importance of pushing myself to do more and

experiment with ideas to better my project even if it will take more time or not turn out as I had

expected in the end. Knowing that incorporating certain elements, or software systems in my

case, that might be stressful and seem like a daunting task to learn at first, will only enhance my

thesis and to use them regardless of my prior knowledge and recognizing I have the capability to

learn new techniques. Learning how to adapt and change how I conducted my research was

examined in my project because complications with the VR system made me have to change

how participants viewed my project. I have learned to ask for help from peers, my mentor, and

other professors because they often have experience with what I am working on or have different

ideas or solutions to my problem or question.

This process has heightened and broadened my understanding of the importance of the

knowledge needed to be understood in this area of design, which allows me to stand behind my

reasonings for why this topic is important to the Interior Design profession. Often this profession

is overlooked or the benefits our knowledge brings to situations is not clearly conveyed or understood. The research process has also helped me better understand how to find sources that will benefit and enhance my study. Understanding how key words can change the entire search is something that I had not thought was as important as it really is and how more in-depth journals are available with these changes.

This process has taught me much more than just about my topic; I have learned how to conduct research and understand what an actual study consists of. I know that this opportunity to study a specific topic has opened new opportunities for me and will help me in future projects throughout my career. Learning how to be flexible, self-motivated, and organized are main takeaways from this process which without, would have made completing this thesis more challenging. Being patient and working through problems has also been a major part of this process, specifically dealing with IRB. Completing this project has pushed me out of my comfort zone and has led to many more experiences that have only helped me grow as a student and as a person entering this career.

References

Abimnwi, N. P., & Njuguna, R. K. (2015). An analysis of in store environment ambience

factor influence on consumer behaviour. *International Journal of Sales, Retailing &*

Marketing, *4*(4), 31–44. Retrieved from

https://www.semanticscholar.org/paper/AN-ANALYSIS-OF-IN-STORE-ENVIRONME

NT-AMBIENCE-FACTOR-Ndeh-Njuguna/373b99f73b9cc26d875b00889a553ff

2f5a3

Biswas, D., Szocs, C., Chacko, R., & Wansink, B. (2017). Shining light on atmospherics: How

ambient light influences food choices. *Journal of Marketing Research*, *54*, 111-123.

doi: 10.1509/jmr.14.0115

Bohl, P. (2014). The impact of airport shopping environments and dwell time on consumer

spending. *Vezetéstudomány / Budapest Management Review*, *45*(11), 11–24. Retrieved

from http://unipub.lib.uni-corvinus.hu/1738/

Brüggen, E. C., Foubert, B., & Gremler, D. D. (2011). Extreme makeover: Short-and

long-term effects of a remodeled servicescape. *Journal of Marketing*, *75*(5), 71–87.

https://doi.org/10.1509/jmkg.75.5.71

Garaus, M. (2017). Atmospheric harmony in the retail environment: Its influence on store

satisfaction and re-patronage intention. *Journal of Consumer Behaviour*, *16*, 265–278.

https://doi.org/10.1002/cb.1626

Goedegebure, R. P. G., van Herpen, E., & van Trijp, H. C. M. (2020). Using product popularity

to stimulate choice for light products in supermarkets: An examination in virtual reality.

Food Quality and Preference, *79*. https://doi.org/10.1016/j.foodqual.2019.103786

Lombart, C., Millan, E., Normand, J.-M., Verhulst, A., Labbé-Pinlon, B., & Moreau, G.

(2019). Consumer perceptions and purchase behavior toward imperfect fruits and

vegetables in an immersive virtual reality grocery store. *Journal of Retailing and

Consumer Services*, *48*, 28–40. https://doi.org/10.1016/j.jretconser.2019.01.010

Martinez, O., Rodriguez, N., Mercurio, A., Bragg, M., & Elbel, B. (2018). Supermarket

retailers' perspectives on healthy food retail strategies: In-depth interviews. *BMC Public

Health*, *18*, 1-16. Retrieved From doi:10.1186/s12889-018-5917-4

Otterbring, T., Löfgren, M., & Lestelius, M. (2014). Let there be light! An initial exploratory

study of whether lighting influences consumer evaluations of packaged food products.

Journal of Sensory Studies, *29*, 294–300.http://doi: 10.1111/joss.12103

Parsad, C., Prashar, S., & Sahay, V. (2017). Impact of impulsive personality traits and store

environment on impulse buying behavior. *Journal of Business & Management*, *23*(1/2),

1–24. Retrieved from

https://pdfs.semanticscholar.org/d669/d15915373a3eb59a6ca7b3c3370cfba6c531.pdf

Quartier, K., Vanrie, J., & Van Cleempoel, K. (2014). As real as it gets: What role does lighting

have on consumer's perception of atmosphere, emotions and behaviour? *Journal of Environmental Psychology, 39*, 32–39. https://doi: 10.1016/j.jenvp.2014.04.005

Spence, C., Puccinelli, N. M., Grewal, D., & Roggeveen, A. L. (2014). Store atmospherics: A multisensory perspective. *Psychology & Marketing, 31*, 472–488. https://doi.org/10.1002/mar.20709

Terblanche, N. S., & Boshoff, C. (2004). The in-store shopping experience: A comparative study of supermarket and clothing store customers. *South African Journal of Business Management, 35*(4), 1–10. https://doi.org/10.4102/sajbm.v35i4.663

Turley, L. W., & Chebat, J.-C. (2002). Linking retail strategy, atmospheric design and shopping behaviour. *Journal of Marketing Management, 18(1–2)*, 125–144. https://doi.org/10.1362/0267257022775891

Wijk, R. A., Maaskant, A. M., Kremer, S., Holthuysen, N. T., & Stijnen, D. A. (2018). Supermarket shopper movements versus sales and the effects of scent, light, and sound. *Food Quality and Preference*, *70*, 32-39. doi: 10.1016/j.foodqual.2017.03.010

Appendices

Pre Survey

Honors Survey

Informed Consent Informed Consent   The Impact of Lighting Type on Consumer Behavior in the Purchase of Healthy Products

My name is Sarah Hartmann and I am a senior Interior Design student at Georgia Southern University. I am doing this research as part of a thesis project for the honors program. I will also be able to learn more about how scholarly research is conducted and be able to present an entire research project before I graduate.

The purpose of this research is to determine how lighting in supermarkets, specifically the produce section, can influence consumers' purchase decisions. This study will also expand on an area in Interior Design that is not often considered and show how designers can be beneficial and provide knowledge when creating these areas.

You will complete a pre and post survey and in between will view a simulation of three different produce sections in a supermarket.

Discomforts and Risks:

 There is a small risk that you could experience motion sickness from the virtual reality simulation. Otherwise, the risks are no greater than those of everyday life. As a participant you are made aware that medical care is available in the event of injury resulting from research, but that neither financial compensation or free medical treatment is provided. Referral information: Health Services - 912-478-5641

Benefits:a. The benefits to participants include learning how lighting can affect what you buy and to be made aware of how you are being influenced to buy certain items that may or may not be healthy for you. You also will be able to experience a virtual reality system.b. The benefits to society include understanding how store environments can influence people while they are shopping and how they can improve their shopping habits. Another benefit would be how our profession can impact many other areas outside of homes and commercial spaces. This research will allow retailers to utilize designers more when creating an inviting space for consumers.

Duration/Time required from the participant: 25 minutes

Statement of Confidentiality

I will be the only person with access to the data and it will be destroyed after 3 years. It will be maintained in a Google Folder and a backup of the data will be kept on a seperate flash drive and

THE IMPACT OF LIGHTING TYPE ON CONSUMERS BEHAVIOR

only accessible by me (Sarah Hartmann). The data will then be given to Sarah Zenti once I graduate in May 2020 and destroyed after 3 years.

Future use of data.

 Data will be discarded three years after the completion of the study.

Right to Ask Questions: Participants have the right to ask questions and have those questions answered. If you have questions about this study, please contact the researcher named above or the researcher's faculty advisor, whose contact information is located at the end of the informed consent. For questions concerning your rights as a research participant, contact Georgia Southern University Institutional Review Board at 912-478-5465.

This study will not use any compensation or incentives to encourage participation.

Voluntary Participation:

 If at any time you feel the need to stop your participation in this study, or do not feel comfortable answering any questions or completing the virtual reality simulation, you are not obligated in any way to do so and may stop immediately by notifying the researcher.

Penalty:

If you do not complete the study you will not face any penalty or consequence.

You must be 18 years of age or older to consent to participate in this research study. By completing the pre and post surveys, you, the participants have consented to participate in this study.

You will be given a copy of this consent form to keep for your records. This project has been reviewed and approved by the GSU Institutional Review Board under tracking number H_20150_____.

Title of Project: The Impact of Lighting Type on Consumer Behavior in the Purchase of Healthy Products

Principal Investigator: Sarah Hartmann, 912-713-8516, sh08205@georgiasouthern.edu

Research Advisor: Sarah Zenti, Statesboro, GA 30460-8057, 912-478-5145szenti@georgiasouthern.edu _____
            _____

○ By completing this survey, I understand I am consenting to participate. (4)

Q1 Code Number

Q2 On average, how many times a week do you go grocery shopping?

○ Daily (1)

○ 4-6 times a week (2)

○ 2-3 times a week (3)

○ Once a week (4)

○ Never (5)

Q3 When you go grocery shopping, how often do you shop at more than one store?

○ Always (1)

○ Most of the time (2)

○ About half the time (3)

○ Sometimes (4)

○ Never (5)

Q4 Which of the following stores do you prefer to shop for groceries? Please select all that apply.

☐ Walmart (1)

☐   Bi Lo (2)

☐   Kroger (3)

☐   Publix (4)

☐   Whole Foods (5)

☐   Aldi (6)

☐   Other (please specify) (7) _____

Q5 When you go grocery shopping, how often do you purchase fresh produce (e.g., fresh fruits and vegetables)?

○ Always (1)

○ Most of the time (2)

○ About half the time (3)

○ Sometimes (4)

○ Never (5)

Q6 Use the slider below to indicate your answer. If you aren't sure, use your best guess.

Not Applicable

	0	10	20	30	40	50	60	70	80	90	100

On average what percentage of your total grocery budget would you estimate that you spend on fresh produce? ()	

Q7 When you go grocery shopping, how often do you shop for pre-made meals (e.g., frozen pizza)?

○ Always (1)

○ Most of the time (2)

○ About half the time (3)

○ Sometimes (4)

○ Never (5)

Q8 How satisfied are you with the produce section at your preferred grocery store?

○ Extremely satisfied (1)

○ Moderately satisfied (2)

○ Slightly satisfied (3)

○ Neither satisfied nor dissatisfied (4)

○ Slightly dissatisfied (5)

○ Moderately dissatisfied (6)

○ Extremely dissatisfied (7)

Q9 When you grocery shop, how many different items do you buy from the produce section?

○ 0 (1)

○ 1-2 (2)

○ 3-4 (3)

○ 5-6 (4)

○ more than 6 (5)

 Q10 At the store where you most frequently shop for groceries, where is the produce section located?

○ In the center of the store to the right (4)

○ In the center of the store to the left (5)

○ In the center of the store (6)

○ In the back of the store (7)

◯ Not sure (8)

Q11 What is your major?

Q12 What year are you in school?

Q13 What is your diet (e.g.,vegetarian, vegan, gluten free, pescatarian, no particular diet)?

Q14 What is your gender?

Q15 How old are you?

__Post Survey__

Honors Post Survey

Q1 Code Number

Q2 Which model (1, 2, or 3) most stood out to you in regards to overall atmosphere, lighting, and most pleasurable environment and why?

Q3 If you could shop in one of the models (1, 2, or 3), which one would it be and why did you choose it over the others?

Q4 Did any of the models resemble a store you have shopped at before? If yes,   which model, what store and what is the resemblance?

Q5 Did any of the lighting in the models make you feel more alert? If so which one and why?

Q6 If you were shopping in all three model stores, in which one do you think you would stay for the longest amount of time?

o   Model 1 (1)

o   Model 2 (2)

o   Model 3 (3)

Q7 Did you notice any significant positive or negative changes in any of the models in regards to the lighting? If so, which model(s) and how so?

Q8 Did you notice any significant changes in any of the models in the way the produce looked? If so, which model(s) and how so?

Q9 Has the simulation given you any insight or realizations about how you shop? If so, please explain.