

An analysis of consumer perceptions, attitudes, visual attention allocation, and  
willingness to pay for clean label food items

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## **ABSTRACT**

As consumers have become increasingly concerned about the ingredients and processes used in food manufacturing, they have started to demand foods that are free from artificial ingredients, natural, organic, and non-GMO. Thus, the clean label trend emerged. This study examined consumers' perceptions, attitudes, willingness to pay, and visual attention allocation toward clean label food items. A standard definition for clean labels has yet to be developed; therefore, several commonly associated attributes were tested to determine how consumers perceive the clean label in relation to each attribute. Four variations of a clean label were designed, including a control without a label, and placed on two researcher-developed products. A sample of 117 undergraduate and graduate students at Texas Tech University were randomly assigned to view one of the four label conditions, providing their insight for two products with their label.

Results from this study demonstrate a lack of awareness surrounding the clean label trend, even as participants shared a desire to consume foods that fit the clean label description. Participants indicated higher perceptions and more favorable attitudes toward labels with the descriptive statements. Visual attention allocation was also higher for labels that included the statements, suggesting more cognitive effort is being used to decipher the label and form opinions leading toward a purchase decision. The results of this study can be used for future development of the clean label trend, as well as provide an avenue for food labeling research. Overall, the findings of this study contribute to ongoing research to develop a definition for clean label foods, as well as determining how consumers perceive and interact with these labels.

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## **CHAPTER I**

### **INTRODUCTION**

#### **Background**

A trip to the grocery store can often be an overwhelming and confusing experience, as multiple label claims adorn food packages, attempting to persuade consumers to purchase products (Bond, Thilmany, & Bond, 2008). Certain package elements are required by law to help consumers make informed decisions; these include product name, nutrition panel and ingredient statement, manufacturer's name, net content, and more (Kuchler et al., 2017). At the same time, companies may decide to include food label claims—a type of marketing claim that summarizes information that is usually found in more detail on the back of the package (Wansink, Sonka, & Hasler, 2004). Food label claims are appearing more frequently as widespread concern over food ingredients has caused consumers to become interested in new food items that encourage a healthier lifestyle (Asioli, Aschemann-Witzel, et al., 2017; The Nielsen Company, 2017).

Many of these front-of-package (FOP) label claims can also be classified as credence attributes, which are used as tools that allow consumers to form quality expectations based on “preferences, previous experiences, and general knowledge” (Andersen, 1994, p. 8). Credence attributes influence purchasing decisions, although they cannot be verified by the consumer through viewing, buying, or eating the product (Kuchler et al., 2017). Examples of credence attributes include country of origin, natural, or humanely raised claims (Kuchler et al., 2017). Conversations about regulation of

credence attributes—elements of food that cannot be seen, felt, or experienced—have increased due to a growing consumer demand for products with these attributes (Andersen, 1994; Grunert, Baadsgaard, Larsen, & Madsen, 1996; Kuchler et al., 2017).

### **History of Food Labeling Practices**

As the U.S. food system has developed, information available to consumers has simultaneously increased. In the 1960s, consumers began to request more information about the foods they were purchasing, as there was little detail given on packaging (Wartella, Lichtenstein, & Boon, 2010). In response, the U.S. Food and Drug Administration (FDA) developed plans for including a nutrition label on packaging, which was deemed voluntary unless nutrition claims were included in labeling or advertising, or nutrients were added to the product (Wartella et al., 2010). After these regulations were enacted in 1973, food label claims became more prevalent as companies began to appeal to consumer desire for quick information about processed foods (Wartella et al., 2010). Several attempts to mandate nutrition labeling were made between 1973 and 1990, although none were successful until the passage of the Nutrition Labeling and Education Act (NLEA) of 1990 (Wartella et al., 2010). This act mandated nutrition labels and created standards for how companies could utilize FOP health and nutrition claims (Kuchler et al., 2017). With the overall goal of decreasing consumer confusion at the grocery store, NLEA provided informational tools in the form of food packaging components (Kuchler et al., 2017; Wartella et al., 2010).

A different path to regulation of food label claims occurred simultaneously at the USDA. This government organization mainly focuses on the regulation of production

methods in agriculture, with many of their food label claims relating to how a product was cultivated or harvested. The 1906 Federal Meat Inspection Act and the 1924 Agricultural Products Inspection and Grading Act both developed definitions for product-based food attributes, providing standards for producers to adhere to in regards to how producers could sell and market their products (Kuchler et al., 2017). The 1990s provided two important pieces of food labeling regulation—NLEA and the Organic Foods Production Act, which created a set of standards for organic agriculture, thus adding to how companies could market organic products using food label claims (Kuchler et al., 2017). Currently, the FDA and USDA coordinate efforts to regulate labeling requirements on meat and poultry products (Wartella et al., 2010).

The food industry continues to develop, with regulations constantly trailing trends in labeling practices. The number and variety of food label claims is increasing, which has provided room for companies to develop their own claims that fit the consumer interest (Asioli, Aschemann-Witzel, et al., 2017). In 2010, Margaret Hamburg, then FDA Commissioner of Food and Drugs, pushed for regulation of FOP labels following the launch of a campaign for healthier eating from First Lady Michelle Obama (Hamburg, 2010). This push led to companies receiving warning letters for including unauthorized health and nutrient content claims on their packaging. ABC News found the companies in question included Nestle, Beech-Nut, and Dreyer's Grand Ice Cream Inc., who were found to have included claims that conveyed products as healthy when they were not (Ferran, 2010). Updates to the nutrition facts panel were released in 2016, although those updates brought no changes to label claim regulations (FDA, 2019). Currently, the FDA

states future proposed regulation will include requirements on FOP labels with “plans to work collaboratively with the food industry to design and implement innovative approaches to front-of-package labeling that can help consumers choose healthy diets” (FDA, 2018, p. 1). Any future changes made to food labeling will need to be done with the dynamic pace of trends in mind.

### **Food Labeling Trends**

Consumers are becoming increasingly concerned with the transparency of their food. Ingredient concern tops the list for many consumers as 75% assess ingredient statements when making purchasing decisions (Label Insight, 2017). In addition, 75% of consumers avoid specific ingredients, including high fructose corn syrup, artificial sweeteners, preservatives, colors, flavors, and more (Label Insight, 2017). Many consumers are shifting their shopping focus to look for specific product attributes, rather than concentrating on the overall nutrition of the product (The Nielsen Company, 2017). They are generally more concerned with products excluding certain ingredients, rather than including beneficial ingredients. For example, consumers tend to favor beverages that are free from artificial sugars, rather than beverages that include extra antioxidants (The Nielsen Company, 2017). As consumers search for products with certain attributes, the labels must include adequate information for the claims to be verified without additional research (Kuchler et al., 2017). Without sincere labeling tactics, consumers have a diminishing desire to trust the information meant to influence purchasing.

Trends in food labeling have proved to be a significant factor in how food products are marketed as companies must shift their focus to fit the consumer desire.

Many do not feel they are getting the full story from food labels, as 44% of consumers do not trust processed foods and the ingredients they contain (The Nielsen Company, 2017). Nearly 43% of new products appearing on the market carry at least one health- or nutrition-related claim (Kuchler et al., 2017), while 39% of U.S. consumers are willing to switch brands based on better ingredient transparency (The Nielsen Company, 2017). With greater pressure for ingredient transparency, manufacturers have developed new food labels in an effort to alleviate consumer concerns.

### **Rise of the Clean Label**

One FOP label that has increasingly made its way onto many grocery store shelves is termed the “clean label” (Aschemann-Witzel, Varela, & Peschel, 2019). Items within the category are typically organic, natural, and “free from” any artificial ingredients; however, a mutually agreed-upon and straightforward definition of clean label food items does not exist (Aschemann-Witzel et al., 2019; Asioli, Aschemann-Witzel, et al., 2017). Research has revealed the clean label marketing appeal acts as a powerful enticer for consumer purchasing habits. The creation of clean label foods developed out of the discussion around ingredient transparency (Joppen, 2006). Michael Pollan (2007), author of the well-known *The Omnivore’s Dilemma*, ushered the idea of clean eating into the consumer’s mindset, asserting the need for eating foods without unknown, unpronounceable, or more than five ingredients. The International Food Information Council (2019) found clean eating to be the most reported diet by consumers in 2019. Those who seek out clean label foods are generally motivated by health, wellness, sustainability, or production concerns (Schmitz-Hubsch, 2018). As these

concerns become more prevalent, the clean label trend shows no signs of slowing or stopping.

With consumer demand for clean label food items increasing, many companies are adapting products to fit the new marketing term (Lefferts et al., 2017). Most clean label products are not new to the market—they are reformulations of existing products with the unwanted ingredients removed (Aschemann-Witzel et al., 2019). This can be seen with the introduction of Hersey’s “Simply 5” chocolate syrup (The Hershey Company, n.d.) or Panera Bread’s promise to only serve food deemed “100% clean” (Panera Bread, 2019). Marketers can follow the clean label trend by creating new and reformulated products, although there is little accountability for companies to stick to a set standard or definition. There is minimal government influence in the meaning and regulation of clean label items, in addition to limited research on consumer perceptions of clean label (Cheung et al., 2016). By exploring consumer interaction with clean label products, future use of the label can be modified to better fit the needs of grocery shoppers.

### **Significance of the Study**

Food labels are an important source of information for consumers as they make decisions at the grocery store (Verbeke, 2005; Zepeda, Sirieix, Pizarro, Corderre, & Rodier, 2013). They act as a heuristic cues, allowing consumers to process information about the product without complicated cognitive measures (Verbeke, 2005). When presented with a visual image or verbal text, consumers gravitate toward visual images as they use them heuristically (Townsend & Kahn, 2014). Similarly, heuristics are known to

influence visual attention (Orquin & Loose, 2013). By measuring visual attention toward food labels, researchers have been able to determine consumers' direct their attention to specific details on a label in order to process the information necessary to make a purchase decision (Vidal et al., 2013).

Although industry insight and previous research has highlighted the growth of clean label food items, there remains a need for understanding which product attributes fall under the umbrella of consumer categorization of these items (Asioli, Aschemann-Witzel, et al., 2017). With no standard definition or government regulation, companies are free to develop their own meaning for the claim, which may not align with consumer understanding of clean label products. Agricultural communicators and food marketing professionals will need to remain informed of the current consumer understanding of clean label food items and how to best communicate product attributes through food label claims.

### **Conceptual Framework Overview**

Asioli et al. (2017) proposed FOP clean label claims are more likely to be processed peripherally as consumers are using text and visual cues to process the meaning of the claim. Therefore, this study will use heuristic processing as a foundation for how consumers understand information found in label claims on the front of packaging. In a heuristic view of persuasion, individuals rely on easily accessible information to make a decision, while in the systematic view, a greater level of cognitive processing is used (Chaiken, 1980). Low levels of issue involvement result in heuristic processing, while high levels of issue involvement elicit systematic processing (Chaiken,

1980). Factors such as perceived consequences, communicator likability, topic and position advocated, and number of arguments directly influence an individual's decision to accept a persuasive message when processing through the heuristic view (Chaiken, 1980). Measuring visual attention to heuristic cues allows a better understanding of visual processing of these elements, as previous research has found attention patterns to heuristic cues to vary depending on the visual and verbal design components of a label (Townsend & Kahn, 2014).

Individuals can only process information heuristically if they have heuristics available in their memory (Chen & Chaiken, 1999). Those who frequently use heuristic processing may begin to rely on it as a means for judgements, which can lower their perception of the need to systematically process information (Chen & Chaiken, 1999). Individuals may also rely on schemas or decision rules, which lead to an automatic use of heuristic processing (Chaiken, 1987). In the case of food labels, individuals assume the FOP claim information on a package is correct, leading to the use of heuristic processing instead of thinking more systematically about a product's attributes by reading the nutrition panel and ingredient statement (Walters & Long, 2012). Ultimately, this leads to the use of food labels as heuristic cues—elements of a package that provide a “shortcut” toward information processing because there is less need for complicated cognitive processing (Walters & Long, 2012).

Package design represents an important trigger for an individual's processing approach, as design elements can influence whether the information is processed through top-down or bottom-up methods (Clement, Kristensen, & Grønhaug, 2013). Text

elements on packages do not immediately draw an individual's visual attention, even as the initial visual attention toward a package relates the decision to purchase that product (Clement et al., 2013). Including both visual and verbal elements in a label design allows for a more precise measurement of how consumers' utilize both heuristic and systematic processing strategies, especially in an environment with many choices, such as the grocery store (Townsend & Kahn, 2014).

### **Purpose of the Study and Research Questions**

In light of the increased demand for food products with clean labels, this study sought to understand how consumers visually interact with these products in their decision-making process. The purpose of this study was to measure perceptions and knowledge of clean labels and determine how those variables affect consumers' visual attention allocation to, attitudes towards, and willingness to pay for clean label food items. This study examines the effect of a clean label—and the “free-from” descriptors it encompasses—on multiple products. Eye-tracking was utilized to measure visual attention allocation, while survey instruments measured knowledge, perceptions, and motivations to purchase. This study compared multiple packages with a clean label including descriptors, clean label without descriptors, descriptors only, and a package with no indication of being clean to determine how consumers interact with and place meaning with clean labels.

As food labels are a significant source of information, it is important to accurately communicate with consumers through the extrinsic quality cues of a product. Therefore, agricultural communicators and food marketing experts must have a realistic view of

consumer perception of food label claims. Based on the conceptual framework of Heuristic-Systematic Model of Processing, this study identified consumers' knowledge, perceptions, motivations to purchase, and visual attention allocation toward clean label food items.

This study was completed in two parts. Consumer knowledge, perceptions, and motivations to purchase were measured through a survey instrument. Visual attention allocation was measured using eye-tracking technology. The following hypotheses and research questions were formed to guide each part of this study:

### **Part I: Perceptions, Attitudes, and Willingness to Purchase**

**RQ<sub>1</sub>:** What were participants' pre-existing attitudes regarding food consumption and packaging?

**RQ<sub>2</sub>:** What were participants' attitudes regarding clean labeled products?

**RQ<sub>3</sub>:** How did participants' perceptions of the clean label design vary between label design and product type?

**RQ<sub>4</sub>:** How did participants' willingness to pay for clean label products vary between label conditions?

**RQ<sub>5</sub>:** What are the participants' perceptions and attitudes regarding the use of clean labels?

### **Part II: Visual Attention Allocation**

**H<sub>1</sub>:** Visual attention allocation will differ significantly based on label design.

**RQ<sub>6</sub>:** How much visual attention is directed at the clean label when viewing different food products?

### **Basic Assumptions and Limitations**

Data for this study were collected through a self-report instrument and eye-tracking technology. For the self-report instrument, it was assumed that participants

answered truthfully and to the best of their ability. An assumption of measuring eye-movements is that fixation on components of media messages implies cognitive processing (Duchowski, 2017).

This research has the limitation of being completed in a laboratory setting rather than in a field setting, and although participants were asked to evaluate the products for purchase, there is no direct purchase motivation. As the population for this study was limited to the Millennial and Generation Z age groups, the findings of this study cannot be generalized to the larger population. Even with this limitation, the results of this study can be used to further understand food purchasing and consumption habits of younger generations.

### **Definition of Terms**

**Area of Interest (AOI):** Prominent areas of a product, including images, text, logos, and labels, which can be determined by the researcher to compare different aspects of a visual design

**Clean:** Free from artificial ingredients, colors, preservatives, natural, non-GMO, and organic

**Extrinsic Quality Cues:** Elements of food product that do not affect the physical product, including: price, brand image, packaging, and food labels (Szybillo & Jacoby, 1974)

**Front-of-package Labels (FOP):** Symbols and statements which claim health, nutrition, processing, or quality benefits of the product (Nestle & Ludwig, 2010)

**Heuristics:** A persuasive element that allows a consumer to make a quick decision without the need for complicated processing, especially when involvement or motivation is low (Chen & Chaiken, 1999; Verbeke, 2008)

**Label Statement:** Identifying words that describe and/or explain a label's meaning

**Label Format:** The appearance of the label and label statements

**Visual Attention Allocation:** The process of an individual directing attention to elements or areas of a stimulus (Duchowski, 2017)

## **CHAPTER II**

### **REVIEW OF LITERATURE**

#### **Overview**

While the previous chapter demonstrated the need for the study, this chapter provides insight into previous research relating to clean labels, perceptions of food labeling, purchase motivations, and trends in both Millennial and Generation Z food consumption. As food label claims are used to concisely present a persuasive message to consumers, their role in opinion formation needs to be measured. To support the assertion of food label claims as heuristics, the Heuristic-Systematic Processing Model (HSM) will be used to meet the needs of this study. In addition, the Total Food Quality Model represents the quality expectation formation, while visual attention emphasizes motivation to allocate visual attention to a heuristic. The literature review details how the quality perception process is achieved through the use of heuristic food label claims, leading to the motivation to purchase a product.

#### **Clean Label Research**

##### **Definition**

Multiple informal definitions for clean label exist, which leaves consumers and producers with the opportunity to create their own subjective meaning (Asioli, Aschemann-Witzel, et al., 2017). Much clean label research has focused on developing a standard definition for the claim (Aschemann-Witzel et al., 2019; Katz & Williams, 2011; Lefferts et al., 2017). A global survey found consumers mainly understand clean labels products as free from artificial ingredients, natural, and organic (Gelski, 2016).

Consumer insights firm Nielsen (2017) categorized the clean label trend into five segments: conventional, free from, clean, simple, and sustainable. Between these five segments, clean label products reject artificial ingredients, hormones, antibiotics, and GMOs, and are seen as organic, fair trade, humane, with an ingredient list of less than 10 recognizable ingredients (The Nielsen Company, 2017). Go Clean Label (2018) asserted ingredients in products with this claim are “easy to recognize, understand, and pronounce” (para. 1). Even with a multitude of meanings for the claim, several product attributes have become the dominant features of clean label products.

The “free from” product attribute remains the encompassing attribute for the clean label trend. Nearly all clean label products are free from a combination of artificial colors, flavors, preservatives, sweeteners, and any other artificial ingredients (The Nielsen Company, 2017). This is generally the area most consumers understand as the basis of clean label products (Gelski, 2016). With the exclusion of these ingredients, the products can also be categorized as natural. The natural food trend has increased alongside the clean label, as consumers are demanding foods that are minimally processed and transparent in regard to ingredients (The Nielsen Company, 2017). Even as one of the terms clean label encompasses, the natural claim faces its own identity crisis. In regards to meat and poultry, natural is perceived to mean no artificial ingredients in the product or the animals’ feed, no growth hormones or antibiotics, no GMOs in feed, and the animal had outdoor access (Consumer Reports, 2015). The USDA Food Safety and Inspection Service (FSIS) only mandates that natural claims include a definition to help the consumer properly interpret the claim (Kuchler et al., 2017).

Similar to free from and natural claims, products without genetically modified organisms are also attracting consumers. The non-GMO claim can be categorized as free from ingredients that were produced through the result of genetic engineering (U.S. Food and Drug Administration, 2018a). This claim supports the mission of clean label products because the lack of genetically-modified ingredients is perceived to be simple (Roseboro, 2019).

Similarly, many clean label products are certified organic and, unlike previous attributes, organic labels are regulated. Organic products are free from artificial ingredients, raised without antibiotics, non-GMO, and have minimal processing (Kuchler et al., 2017). Companies with products bearing this claim are required to be certified by the USDA or one of its certification agencies before being allowed to market products as organic (Kuchler et al., 2017). Because the attributes of organic foods align with clean label products, they are often closely associated (Roseboro, 2019).

The development of a clear and concise definition of the clean label would allow more valuable measurement of consumer perceptions, as well as greater transparency in food manufacturing, as producers would be confined to a set standard (Katz & Williams, 2011). The definition is subjective depending on the attributes a company is wishing to publicize, and for consumers, “clean label is in the eye of the beholder” (Reiser, 2019, as cited in Roseboro, 2019, p. 2).

### **Consumer Perceptions**

Clean label food items have gained considerable market share in recent years, though little research has been conducted on the consumer understanding of such

products. Joppen (2006) interviewed Ian Gordon, of business research firm Giract, who asserted the term originated in the 1980s when European consumers began avoiding food additive numbers listed on packaging. These additive numbers were commonly associated with health risks and consumers were repeatedly informed organic products were better, leading to the demand for clean labels (Gordon, 2006, as cited in Joppen, 2006). In the United States, clean label products are more common, although 45% of consumers have no understanding of what the label means (Gelski, 2016). With limited education on the part of the food industry, the clean label panders to those who perceive all chemicals as being dangerous for consumption (Lefferts et al., 2017).

Even with little understanding of the concept, consumers are still demanding the product attributes encompassed by the clean label. For example, previous research has found consumers prefer to avoid artificial ingredients and heavily processed foods (Katz & Williams, 2011). Hughner, McDonagh, Prothero, Schultz, and Stanton (2007) found preference for organic foods to be increasing due to media influence about the potential health and environment impacts of consuming conventional products. Similarly, natural food consumption has expanded as the term becomes increasingly synonymous with healthy eating and somewhat comparable to early human diets (Moscato & Machin, 2018). With the popularity of these attributes on the rise, most findings point toward a future of clean products across categories, as consumers are becoming increasingly concerned about the ingredients in their food (Label Insight, 2016, 2017; The Nielsen Company, 2017). The clean label trend is viewed as more than just removing unwanted ingredients from a product—it comes with the promise that companies are being

transparent in their marketing to ensure consumers are getting the full story from the items they purchase (Schmitz-Hubsch, 2018).

### **Perceptions of Food Labeling**

Food labels are included on packaging as a persuasive and heuristic cue for consumers to glean valuable information without much need for cognitive processing (Asioli et al., 2017). Food labels can be grouped into two distinct categories—those that are required by law (i.e. nutrition panel) and those that are voluntary on the part of the manufacturer (i.e. food label claims) (Kuchler et al., 2017). Teisl and Levy (1997) found consumer behavior is significantly affected by both the nutrition information provided on labels and a concurrent push to educate consumers on the meaning of the contents of the nutrition label through food label claims. Although the nutritional benefits of a product do have a large influence on how consumers interact with a product, there are other factors that may have more leverage depending on the consumer and their food-purchasing habits.

A number of factors contribute to consumer perception of a product, including price, taste, sociodemographic traits, product, nutrition, health knowledge, and advertising claims (McCluskey & Loureiro, 2003; Teisl & Levy, 1997; Wansink et al., 2004). The combination of these factors ultimately leads to the development of quality perceptions for products, which is seen as significantly important in evaluating consumer behavior (Jacoby, Olson, & Haddock, 1971; Olson & Jacoby, 1972). Information learned through government sources, media sources, and manufacturers may also contribute to consumers' understanding of health claims in advertising and on packaging (Ippolito &

Mathios, 1990). Consumers' personal relevance also influences their perceptions. Health goals have been found to influence label usage and further processing of information included on the label (Tanner, McCarthy, & O'Reilly, 2019). It has been observed that consumers may make their decisions "as if they have nutrient or health risk budgets," meaning they only allow themselves a certain amount of an ingredient or food deemed unhealthy (Teisl & Levy, 1997, p. 26). While food label claims are only one part of the perception development, they play an important role in processing information to gain insight into the quality of a product.

The design of a food label plays a large role in the perception formation as it is often these elements that draw a consumer's visual attention toward a product (Silayoi & Speece, 2004). Visual designs have been found to promote more positive perceptions of a product, as well as the overall brand (Wang, 2013). Schuldt (2013) found label color to influence perceptions because elements designed in green promoted a greater notion of health from consumers. Specifically, those who carried a higher motivation sought products that incorporated these "healthier" label cues (Schuldt, 2013). A package design that incorporates visual elements, specifically images and a variety of colors, caters to low involvement consumers, while verbal elements draw in high involvement consumers (Silayoi & Speece, 2004). Similarly, a consumer's attitude toward visual packaging elements influences the perceptions they form regarding the product's quality (Wang, 2013). Both time pressure and involvement level mediate the effects of visual and verbal design elements when a consumer is forming perceptions and making their purchase decisions (Silayoi & Speece, 2004). Therefore, incorporating visual and verbal elements

into a package design provides routes for both heuristic and systematic processors to form perceptions of a product.

Walters and Long (2012) found novice consumers process food label information differently from those who are more familiar with nutrition labels. Those considered experts in regard to food nutrition and labeling have more knowledge and a greater ability to process the messages contained on packaging (Walters & Long, 2012). Labels are often understood as a group, meaning consumers have difficulty separating the meaning of multiple label claims when arranged together on a package (Bond et al., 2008). The novice—generally considered to be average—consumer is more likely to focus on extrinsic cues due to low involvement in an issue, whereas a consumer with a higher involvement is able to see a link between extrinsic cues and intrinsic cues (Walters & Long, 2012).

### **Extrinsic Cues**

Extrinsic quality cues include price, brand image, packaging, and food labels (Szybillo & Jacoby, 1974). Altering extrinsic cues would have little effect on the actual quality of a product, but may change the consumer's perception of quality (Jacoby et al., 1971; Szybillo & Jacoby, 1974). The use of food label claims as extrinsic cues is outlined in Grunert, Baadsgaard, Larsen, and Madsen's (1996) Total Food Quality Model, which combines cost, extrinsic quality, and intrinsic quality to determine the expected quality and purchase motivation that lead to a consumer purchasing a food product (Figure 2.1).

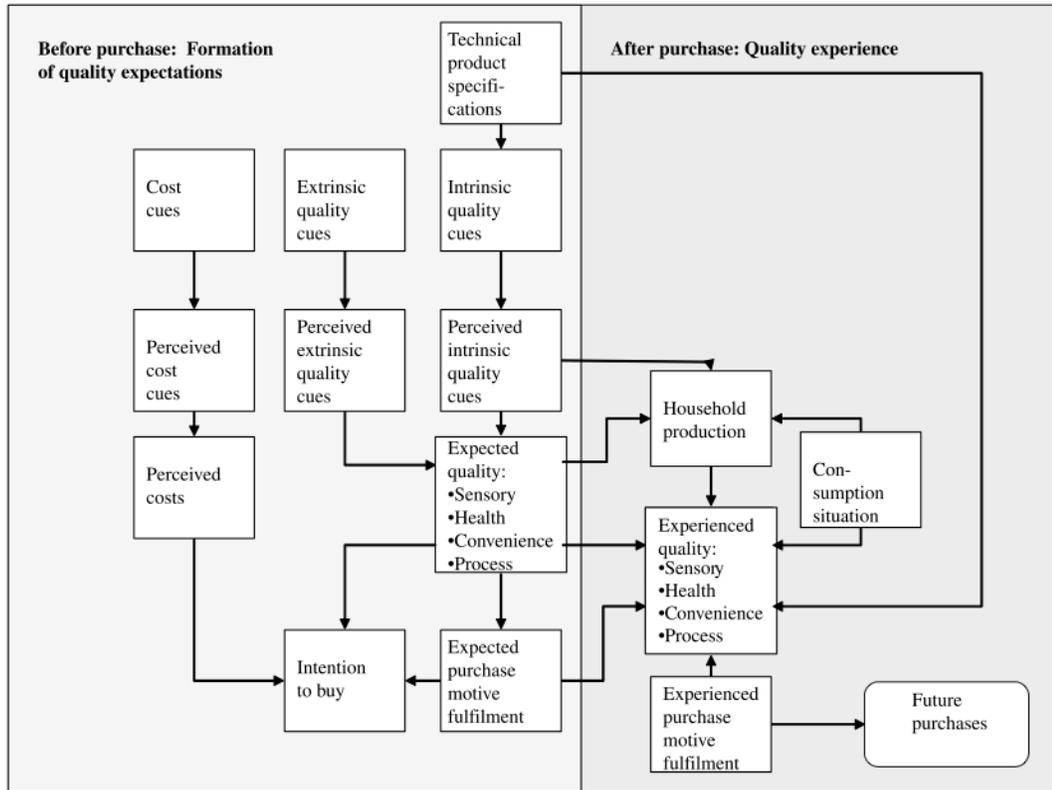


Figure 2.1. Total Food Quality Model (Grunert et al., 1996)

The authors found extrinsic quality cues to be used primarily when the given information is predominated by credence attributes (Grunert et al., 1996). In the context of this study, the clean label is classified as a food label claim; therefore, it would align with extrinsic quality factors, in addition to being a heuristic cue.

### Intrinsic Cues

Intrinsic quality cues include physical product attributes such as taste, smell, and texture (Szybillo & Jacoby, 1974). Essentially, if intrinsic cues were to change, the physical product would change (Jacoby et al., 1971; Szybillo & Jacoby, 1974). Intrinsic quality cues have been found to have a greater influence on quality perceptions when compared to extrinsic cues, although, for packaged food products, it is difficult to discern

intrinsic cues with little to none of the food visible (Olson & Jacoby, 1972). When information about intrinsic cues is not immediately available to the consumer, they turn to extrinsic cues to obtain their desired information (Grunert et al., 1996).

### **Total Food Quality Model**

Developed by Grunert et al. (1996), the Total Food Quality Model (TFQ Model) assesses multiple factors that determine a consumer's motivations to select food items before and after purchase. This model is built upon Andersen's (1994) model of the quality perception process, but includes additional factors that relate to the food industry (Grunert et al., 1996). Previous literature has found consumers use motivational cues to form their impressions of a product, although these cues may not always relate to the actual quality of the product (Jacoby et al., 1971; Szybillo & Jacoby, 1974). The TFQ Model combines cost, extrinsic quality, and intrinsic quality to determine the expected quality and purchase motivation that lead to a consumer purchasing a food product and, ultimately, whether they will purchase it again (Grunert et al., 1996). These factors develop a consumer's perceptions of quality, while the consumption and experienced quality will lead consumers to their decision to either purchase the product again or not.

Consumers make their decisions based on their perceptions of a product's quality rather than the actual quality (Lusk, 2013). The quality perception process relies on multiple factors, although perceived quality plays a large role in motivations to purchase the product. A consumer must develop their perceptions of a product's quality based intrinsic and extrinsic cues as well as external factors such as values, beliefs, attitudes, situation, environment, and socio-demographic factors (e.g. age, gender, lifestyle, etc.)

(Fernqvist & Ekelund, 2014). Therefore, there is no concrete scale to determine how a consumer will perceive a product because there are a multitude of factors that should be taken into consideration.

The TFQ Model has been used previously to determine how country-of-origin labels affect a consumer's perceptions of beef products (Allen, Meyers, Brashears, & Burris, 2011) as well as consumer perception of grass-feed beef (Crandall, 2018). Similarly, Grunert, Bredahl, and Brunsø (2004) used the TFQ model to outline how consumers form perceptions of meat. Søndergaard and Edelenbos (2007) analyzed the expected quality between parents and children for vegetable-based products. By using the TFQ Model, this study will aim to understand the impact the clean label has on food items and how it can be better used to inform consumer's purchasing decisions. A consumer's quality perception process relies heavily on the application of both intrinsic and extrinsic cues, influencing perhaps the most important factor—purchase motivation.

### **Purchase Motivations**

#### **Factors Influencing Purchasing**

Many factors influence a consumer's motivation to purchase a product. Cost, extrinsic quality cues, intrinsic quality cues, as well as expected fulfillment after purchase all contribute to an individual deciding to buy and consume an item (Grunert et al., 1996). More specifically, Lähtenmäki (2013) proposed nine factors that influence purchase motivation based on food label claims, consisting of amount of information, benefit, risk reduction, familiarity, production method, existing health image, socio-demographics, perceived need, and attitude. The combination of these factors impacts consumer

perceptions of a products' credibility, healthiness, appeal, and the consumer's willingness to use the product (Lähteenmäki, 2013). Furthermore, these factors can be grouped into three distinct categories which interact with each other: claim formation, product information, and consumer factors.

**Claim Formation.** Because claims are included on packaging as an alternative source for information already included elsewhere, they can appear in various forms. The length and amount of information available from the claim affects how a consumer understands the claim—shorter claims on the front of a package were found to be more effective than longer claims, as long as the information is relevant (Wansink et al., 2004). These FOP label claims may also act as a distinct marketing tactic, separating products from each other (Wansink et al., 2004). In general, claims either focus on the benefits obtained or the risk avoided by consuming or purchasing the product (Lähteenmäki, 2013). For consumers to see each claim as influential, they must recognize the topic and make a connection between their needs and the advantages of the product (Lähteenmäki, 2013). For example, a consumer with a gluten allergy may see a product with a gluten-free label and recognize that that product has benefits that support their health needs. Information delivered through a label claim can have a large impact on a consumer's decision to purchase, but its text and visual elements must be suitable for the audience to discern its credibility (Silayoi & Speece, 2004).

**Product Information.** While it may seem evident, perceptions of the physical product play a role in the formation of purchase decisions. Claims added to packaging must provide information that is complementary to the product and not promoting an

attribute that is clearly present (Lähteenmäki, 2013). This phenomenon is especially noticeable when it comes to adding claims about a product's naturalness or production methods (Lähteenmäki, 2013). For example, adding an all-natural claim to a bag of vegetables has little effect on the consumer, whereas it would have a greater impact on a processed product. Misinformation previously associated with these claims can hinder the efforts of a label claim more than the claim provides consumers a reason to purchase the product (McFadden & Huffman, 2017).

**Consumer Factors.** Each consumer has a different background that contributes to their preferences and motivations to purchase. Age, gender, and geographic location have some influence in how a consumer is affected by a label claim (Lähteenmäki, 2013). Younger consumers are more responsive to the information provided on label claims, whereas older consumers may have a hard time understanding the information (Burton & Andrews, 1996). Males have been found to be less likely to use food labels and possess less nutritional knowledge compared to females (Nayga, 2000). A consumer's country and culture greatly influences their food purchasing habits as each individual develops a distinct view of food based on the traditional marketing and production practices in different countries (Ares et al., 2016). In general, consumers must feel they have a need that can be satiated by purchasing and consuming the product (Grunert et al., 1996). Ultimately, these factors develop at the individual level and will be different for each person.

### **Influence of Current Food Label Trends on Purchase Motivations**

With so many influential factors, consumers want food labels that concisely relay information needed to make an effortless decision (Silayoi & Speece, 2004). Consumers are open to manufacturer's marketing antics because they want more information included, which can help lead to educated decision making (Label Insight, 2016). However, research has shown manufacturers struggle to create compact cues that accurately describe product attributes (Lähteenmäki, 2013). Meanwhile, consumers are increasingly losing trust in current information delivery methods (Label Insight, 2016; Verbeke, 2008). Multiple agencies provide a variety of regulated and unregulated labels for inclusion on packaging, which leads to confusion when hundreds of similar products are displayed next to each other with different information on each package (Kuchler et al., 2017). Only labels from the most well-known agencies are trusted by consumers, leading to greatest push for a purchase decision (Golan, Kuchler, Mitchell, Greene, & Jessup, 2001). In order to promote a purchase decision, packaging must be visually appealing with prominently displayed relevant information that conveys details quickly for those consumers under time-pressured decisions (Silayoi & Speece, 2004). Pieters and Warlop (1999) found time pressure resulted in consumers focusing on imagery, rather than textual information as it required less cognitive effort to make an expedited decision. As food labeling trends continue to evolve, an increased need exists for manufacturers to apply effective use of food label claims to appeal to all sectors of consumers (Silayoi & Speece, 2004).

## **Millennial and Generation Z Food Trends**

Younger generations have taken a strong interest in the purchasing and consumption of their food. There is no set range for when these younger generations begin and end; some sources cap Millennials in the late 1990s (Dimock, 2019), while some say the generation stretches to the mid-2000s (Kuhns & Saksena, 2017; Rosenbloom, 2018). The Pew Research Center defines Millennials as those born between 1981 to 1996 and those in Generation Z as born in 1997 through 2012 (Dimock, 2019). With these age ranges defined, the tail end of the Millennial generation and the oldest members of Generation Z align with ages of most current undergraduate and graduate students. Both of these generations have been found to engage in similar food consumption habits.

### **Millennial Generation**

The Millennial generation is the driving factor behind many of the food trends dominating the market today. This generation is increasingly interested in how their food is produced—focusing on ingredient transparency, sourcing, and specialty products (Hoffman, 2012; Mushkin et al., 2012; Rosenbloom, 2018). Specifically, Millennials want to be informed when making purchases, which is driving their push for more detailed food labels (Rosenbloom, 2018). Millennials are spending more during a grocery shopping trip than any previous generation—nearly \$60, compared to \$46 for Baby Boomers (The Nielsen Company, 2018). They are willing to pay a higher price to consume a product with specific attributes, whether that includes organic, natural, or from a specific brand (Hoffman, 2012; Mushkin et al., 2012).

As Millennials seek out products with specific attributes, they are reinventing the concept of healthy foods. To this generation, healthy products aren't "low-fat or high-fiber... it's food that's natural, organic, locally sourced, or sustainable" (Rosenbloom, 2018, p. 1). The International Food Information Council (2016) found a pattern of Millennial consumers associating healthy foods with organic, natural, and foods with minimal ingredients. A more recent survey from the International Food Information Council (2019) found similar results in regard to the increased interest in specific food attributes, although the results were not broken down by age group. For Millennials, leading a healthy lifestyle is key "because ultimately it's about one health for all—a healthy animal, a healthy person as well as a healthy environment" (Armstrong, 2017, as cited in Gerdes, 2017, p. 22).

### **Generation Z**

Following behind Millennials, Generation Z is predicted to uphold and expand the same desire for healthy foods with specific product attributes (The NPD Group, 2018). This generation is starting to reach the age where they are responsible for their own food choices and they are purchasing products that are fresh, transparent, and align to their image of health (The NPD Group, 2018). This generation has grown up with health in mind, as they follow the healthy ways of their Generation X parents (Shoup, 2018). Even as they are being raised in a culture of health-consciousness, Mintel (2018) found 25% of teens are worried about remaining healthy. To maintain a healthy lifestyle, Generation Z consumers are devoted to clean eating, specifying that it enhances their quality of life (The NPD Group, 2018). Being the most diverse generation yet, they are also more open

than previous generations to international foods (Mintel Press Team, 2018). As Generation Z matures, their focus on clean eating and a healthier lifestyle will continue to shape the food production industry and encourage an increased need for products that fulfill these needs.

### **Visual Attention Allocation**

Visual attention is seen as a “window or spotlight that locally improves the speed and reduces the threshold for processing events” (Pieters & Warlop, 1999, p. 2). Attention manifests itself in three different ways—selective attention, preparatory attention, and maintenance attention (LaBerge, 1995). Selective attention is required to make a perceptual judgement, while preparatory attention increases the speed at which an individual makes that judgement (LaBerge, 1995). Conversely, maintenance attention occurs when an individual is “simply attending to something with ‘nothing else in mind’” (LaBerge, 1995, p. 13). Without the three forms of attention acting in conjunction, the speed and accuracy of message processing is decreased (LaBerge, 1995). Attention determines which areas of interest of a subject need to be processed, and through time allocation and fixations, the effectiveness of a persuasive message can be determined (Wedel & Pieters, 2008). In this study, measuring visual attention allocation will provide insight into the influence and use of food label claims as a heuristic.

### **Visual Attention Metrics**

Visual attention in eye-tracking studies is measured through multiple metrics, which each represent a distinct component of eye movement. The most common metric is fixation, which describes the eye pausing on an area of interest and represents 90% of

viewing time (Duchowski, 2017). Movements between fixations are referred to as saccades, where the eye is rapidly shifting to new locations both voluntarily and involuntarily (Duchowski, 2017). When the eye is tracking an object, movement can be referred to as a smooth pursuit (Duchowski, 2017). Fixations, saccades, and smooth pursuits are the three main eye movements that are needed to measure visual attention, as together they affirm an individual's selective attention (Duchowski, 2017). Both fixations and smooth pursuits represent the desire to sustain attention on an object, while saccades show the desire to shift the attention focus (Duchowski, 2017).

From these three eye movements, greater insight into visual attention and its interaction with human behavior can be evaluated. When grouped together, these three movements are classified as scanpaths (also known as gazepaths), which represent an individual's complete visual attention pattern (Duchowski, 2017). Glaholt, Wu, and Reingold (2009) found fixation on an object to be related to the decision to choose that object. The authors further elaborated that fixation on specific attributes of an object also indicates preference for the object (Glaholt et al., 2009). The direction and length of eye movements is directly related to decision-making as the choices made by an individual have been found to be dependent on attention (Orquin & Loose, 2013). Fischer (2017) used eye-tracking to understand what elements of a magazine advertisement were viewed and how they related to evaluation of the advertisement. Fenko, Nicolaas, and Galetzka (2018) looked at consumers' visual attention allocation to several food labels with and without time pressure to determine which labels garnered more attention compared to health perceptions of each label. Chandon (2002) utilized eye-tracking to determine if

visual attention allocation has an impact on brand recall when making purchase decisions at the grocery store. Thus, measuring eye movements provide impactful guidance for visual attention research as it relates to decision-making processes.

### **Visual Attention Motivation**

A number of factors must be considered when determining motivation to allocate visual attention to food labels. Consumers must have a desire to purchase healthy foods and adequate time to accurately assess labels in order to pay attention to health-related food labels (Fenko et al., 2018; Hoek, Roling, & Holdsworth, 2013). In a study comparing the effects of health and taste motivation on visual attention, Visschers, Hess, and Siegrist (2010) found those with a taste motivation directed little attention to the nutrition panel, rather looking for alternative information on the package, while those with health motivations primarily focused on the nutrition panel. Design was an additional factor in consumer motivation to direct attention to food packaging (Visschers et al., 2010). Simpler designs promptly directed consumers to the nutrition information, while overcrowded designs required consumers to attend to FOP information before they could focus their attention to the nutrition panel (Visschers et al., 2010).

Visual attention is often highly influenced by time constraints on a consumer's behalf (Fenko et al., 2018), further increasing the need for creating food labels that can be easily processed (Silayoi & Speece, 2004). Currently, many consumers feel they do not have sufficient time available to visually process food labels because of the overwhelming amount of information presented when scanning a grocery store shelf (Tanner et al., 2019). Three strategies consumers can use to handle time constraints are:

absorbing information more quickly, only attending to part of the information available, or switching between systematic and heuristic strategies (Pieters & Warlop, 1999).

Understanding the type of information and vehicle of delivery that consumers direct visual attention to can help marketers develop messaging practices that will aid consumers in making purchase decisions (Van Loo, Grebitus, Nayga, Verbeke, & Roosen, 2018).

### **Visual Attention and Heuristics**

Measuring visual attention allocation to heuristic cues is a powerful tool for providing insight into how specific product attributes are used toward purchase motivations (Van Loo et al., 2018). The grocery store is a distracting environment, which presents consumers with the need to make decisions quickly, therefore supporting the use of heuristics as a means for processing the available information (Hoek et al., 2013).

Food label claims act as heuristic cues as consumers view packaging elements that are associated with certain attributes, such as green means natural, or claims such as “fair trade,” thus allowing consumers to look at a food label claim and easily make a decision regarding the product (Hoek et al., 2013). Heuristic cues are influential when consumers lack the necessary background to process information systematically, leading them to use information already stored in their memory to make a decision regarding a persuasive message (Hoek et al., 2013).

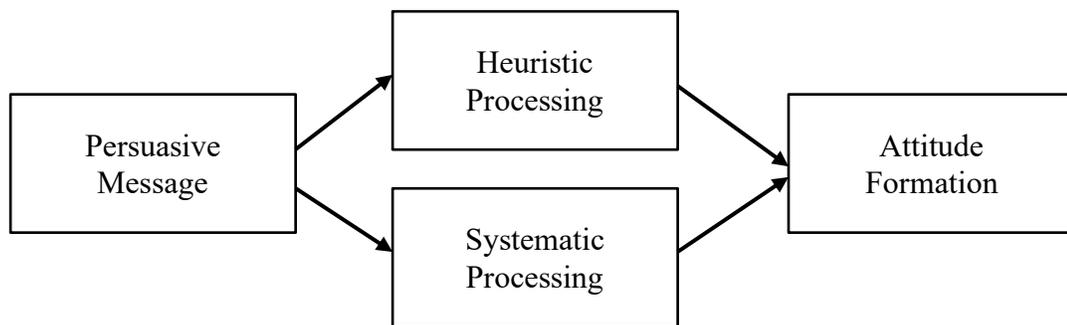
Previous research has found visual heuristic cues, such as designed food label claims, to be more influential than verbal heuristic cues, as verbal heuristic cues may result in a more systematic processing style (Townsend & Kahn, 2014). The amount of

choices available affects how visual and verbal information is processed—both small and large amounts of choices results in using visuals to make quick decisions, although consumers without a predefined product preference tend to rely on textual information (Townsend & Kahn, 2014). Measuring visual attention to package elements allows for a greater understanding of how a consumer’s eye movements relate to their cognitive processing of all visual aspects in their field of vision (Wedel & Pieters, 2008). Orquin and Loose (2013) found visual attention related to decision making when the consumer has a task they must complete, e.g. understanding the information included in a certain label. This can influence how eye movements are allocated to certain areas, in order to reduce cognitive strain (Orquin & Loose, 2013). Therefore, heuristic cues influence attention patterns of decision-makers (Orquin & Loose, 2013), illustrating the need to measure visual attention to food label claims.

### **Heuristic-Systematic Processing Model**

When viewing a persuasive message, individuals make their decision based upon either information they already possess (i.e., heuristically) or through comprehensive analysis (i.e., systematically) (Chaiken, 1980, 1987; Zuckerman & Chaiken, 1998). The method through which an individual processes information is “conditional on whether consumers perceive a real need for information, as well as a clear benefit from engaging in active reasoning and using the information provided” (Verbeke, 2008, p. 287). Therefore, attitude formation occurs either heuristically or systematically—mediated by the individual’s issue involvement, message characteristics, and source characteristics—with the purpose of evaluating the credibility of a message (Chaiken, 1980). This idea

serves as the basis for the Heuristic-Systematic Processing Model (HSM), which has been previously used in the realm of food labeling studies to determine how information included on packaging is processed by the consumer (e.g. Andrews, Netemeyer, & Burton, 2009; Bradu, Orquin, & Thøgersen, 2014; Kim & Paek, 2009; Verbeke, 2008). While nutritional information is more likely to be processed systematically, food label claims are processed heuristically as the information contained is designed to be sorted out effortlessly (Verbeke, 2008). This model assumes individuals have a limited capacity to thoroughly process information, which leads to the use of heuristic processing more often as it requires less cognitive effort (Gigerenzer & Gaissmaier, 2011; Zuckerman & Chaiken, 1998). Specifically, this model posits consumers have a limited capacity for information processing because individuals typically have a time constraint, scarce knowledge of a subject, or must simultaneously process other cognitive stimuli (Zuckerman & Chaiken, 1998). Figure 2.2 displays the model.



*Figure 2.2.* Heuristic-Systematic Processing Model (Chaiken, 1980)

### **Heuristic Processing**

When individuals are processing information heuristically, they rely on easily accessible information to make their decision (Chaiken, 1980). They have few cognitive resources to allocate to the persuasive message, instead depending on cues such as who is communicating the message or the amount of arguments contained (Chaiken, 1980, 1987; Gigerenzer & Gaissmaier, 2011). Source characteristics are often much more important in regards to heuristic processing as little cognitive processing is needed to evaluate the communicator when compared to message characteristics (Chaiken, 1980). Those who process information heuristically often have low involvement in the issue; therefore, they have little to gain from spending increased cognitive effort on the message (Chaiken, 1980). Individuals often establish set rules based on previous experiences involving similar persuasive messages, which allows them to quickly access that information to aid in opinion formation (Chaiken, 1980; Zuckerman & Chaiken, 1998). Heuristic processing of information can lead to an increased amount of mistakes where individuals may accept information that would be rejected if processed systematically; the same is true for rejecting information that might have been accepted otherwise (Chaiken, 1980). Consumers use food labels as heuristic cues to process information on the package as they are making a purchase decision (Asioli, Aschemann-Witzel, et al., 2017).

### **Systematic Processing**

Comparatively, when persuasive messages are processed systematically, substantial cognitive effort is used to evaluate the message's arguments (Chaiken, 1980; Zuckerman & Chaiken, 1998). With this mode of processing, the individual is

considerably more involved with the issue, leading to a greater investment in the outcome of their decision (Chaiken, 1980). With a higher involvement, individuals devote more time to dissecting an argument. Message characteristics are more prominent as systematic processing requires all aspects of a persuasive message to be evaluated (Chaiken, 1980). In order to process information systematically, individuals must have decent levels of cognitive availability, motivation, and knowledge of the subject to form an opinion (Zuckerman & Chaiken, 1998). Without those three requirements, individuals will revert to heuristic processing. Systematic processing increases trust in a topic; therefore, this type of processing “will occur when heuristic processing alone cannot close the actual-desired confidence gap” (Zuckerman & Chaiken, 1998, p. 623). Systematic processing may be used when an individual must rely on the results of their decision—specifically, when the issue is personally relevant or an individual may have to defend their decision (Chaiken, 1980). While FOP food labels have been found to be processed heuristically, nutrition information included on the back of packaging tends to be systematically processed due to the influence of certain nutrients on an individual’s overall health attitude (Verbeke, 2008).

### **Individual Attributes**

Several attributes influence whether information is processed heuristically or systematically. Issue involvement, message characteristics, and source characteristics guide an individual to one of the two routes of processing depending on the desired outcome of their decision (Chaiken, 1980). High issue involvement and in-depth processing of message characteristics correlate with systematic processing, while low

issue involvement and reliance on source characteristics lead to heuristic processing (Chaiken, 1980).

**Issue Involvement.** The method by which information is processed relies on the individual's issue involvement. Issues that are more relevant to an individual will be processed systematically because they have a greater interest in the outcome of their decision (Chaiken, 1980). Because this method requires more cognitive effort, it is used when a reliable decision is needed (Chaiken, 1980). Information processed heuristically is less relevant to the individual, allowing for less cognitive effort to be used to make a decision (Chaiken, 1980). Through this method, individuals are likely to choose the value of their time and effort requirements over the outcome (Chaiken, 1980). Issue involvement greatly affects how an individual will process a persuasive message as the repercussions of the outcome can vary considerably.

Laurent and Kapferer (1985) found several factors that influence consumers involvement level: perceived importance, perceived value, perceived enjoyment, and perceived risk. The combination of these factors leads to individuals possessing low involvement when purchasing some goods, while high involvement for others. Food is a basic need that is relatively low in price compared with other goods and nearly any product can be substituted by another, leading consumers to invest little involvement in the purchase and consumption of food products (Verbeke, 2005). Visual elements on a food package help low involvement consumers make decisions, especially when they are faced with a time-pressured decision (Silayoi & Speece, 2004).

**Message Characteristics.** Message characteristics include length, number of arguments, understandability, and validity of the argument (Chaiken, 1980). During systematic processing, message characteristics are analyzed more readily as they require more cognitive effort to thoroughly scrutinize (Chaiken, 1980). Combined with the high involvement of systematic processing, these elements allow for all facets of a persuasive message to be evaluated (Chaiken, 1980). As message characteristics are often highly detailed, the heuristic view of processing avoids scrutinizing the contents of each persuasive message, rather focusing on source characteristics (Chaiken, 1980).

Labeling has become a valuable tool for communicating product attributes to consumers; however, message composition can have a great impact on the label's effectiveness (Verbeke, 2005). For food products, message characteristics such as tonality, directionality, and appeal to the consumer's risk prospect can have an effect on information processing (Verbeke, 2008). Tonality involves whether the message is intended as informational or persuasive, while directionality of a message either incorporates the consumer or makes a general statement (Verbeke, 2008). Because consumers are heavily influenced by the impact of consuming a product, appealing to their risk prospect draws a more intense evaluation of the message (Verbeke, 2008). Roe and Teisl (2007) looked at label claim credibility based on message content, finding simple labels were more likely to resonate with the consumer, even if they did not contain information about the claim's meaning. Focusing on genetically-modified labels, the authors found labels declaring the use of genetically-modified ingredients were more positively received than labels asserting the product was free from these ingredients, as

long as the labels provided reasoning for the use of such ingredients (Roe & Teisl, 2007).

A simple message composition on FOP labels can lead to consumers processing the information heuristically, while complex messages result in systematic processing (Verbeke, 2008).

**Source Characteristics.** Source characteristics include credibility and communicator likability, as these aspects relate to the ethos of an argument (Chaiken, 1980). Source characteristics utilize less cognitive effort to fully process, lending themselves to be a key aspect of heuristic processing (Chaiken, 1980). Source credibility has been found to be highly influential for low involvement individuals, while not having the same effect for high involvement individuals (Rhine & Severance, 1970). Employing these findings, opinion formation for low involvement individuals is greatly affected by the likability of the communicator as well as how credible their argument appears (Chaiken, 1980). The opposite is true for high involvement individuals as they are less swayed by the source characteristics of a message (Chaiken, 1980).

Source credibility of labels can greatly affect consumer perception and the route of information processing, specifically depending on whether the label is regulated or unregulated (Roe & Teisl, 2007). If the consumer recognizes the label and its regulatory agency, they are able to easily discern the credibility, leading to the use of heuristic processing to make an overall decision about the product (Roe & Teisl, 2007). Trust in the source plays a big role in directing the consumer toward heuristic processing as they are easily able to make a decision regarding the persuasive message (Verbeke, 2008).

Without automatically recognizing the source as trustworthy, consumers are required to systematically process the information in order to make their decision (Verbeke, 2008).

### **Heuristic-Systematic Processing in Agriculture and Natural Resources**

Heuristic-systematic processing has been used as a theoretical foundation for persuasive messaging research in agricultural topics, including food-related research. Zuckerman and Chaiken (1998) examined the role of heuristic processing in relation to product warning labels and how individuals process them. This study solidified the use of HSM as a framework for processing of packaging labels based on the heuristics presented. Similarly, HSM has been used in a risk management context to determine how consumers process persuasive messages about genetically modified foods with differing motives (Kim & Paek, 2009). Bradu, Orquin, and Thøgersen (2014) found traceability label influenced consumers' decision to purchase a chocolate bar as they were processed heuristically due to increased consumers' ethical concerns. Verbeke (2008) recommended using heuristic processing in the context of food- and nutrition-related research due to most decisions being made based on heuristics.

### **Summary**

This literature review provided a background of food label claims and their role in the quality perception and purchase processes, as well as visual attention allocation and the Heuristic-Systematic Processing Model. Current trends in food labeling and Millennial and Generation Z consumption were explored, which provided a look at how the clean label trend was formed and contributed to the need for further research in this

area to determine how clean labels are understood, processed, and used towards purchase decisions.

## **CHAPTER III**

### **METHODOLOGY**

#### **Overview**

The rise of food label claims has proven to be more than a fad. The widespread adoption of clean labels in the food system has triggered a need for research to interpret how consumers view these heuristic tools when scanning shelves at the grocery store. This chapter will provide insight into the research questions and hypotheses developed for the study, as well as the utilized 2x2x2 within- and between-subjects factorial design with a control utilized. In addition, the sample is identified by their demographic information, food consumption and purchase habits. An overview of the instrumentation and eye-tracking experiment, as well as the complete study procedure are included. Finally, the data analysis process is discussed.

#### **Purpose, Research Questions, and Hypotheses**

In an effort to understand the effects of the clean label on food packaging, the purpose of this study was to identify consumers' perceptions and knowledge of clean labels and determine how those variables affect visual attention allocation to, attitudes towards, and willingness to pay for clean label food items. Utilizing the Heuristic-Systematic Processing Model, the researcher sought to understand how consumers process clean label claims and the influence on their food purchasing decisions.

This study was divided into two parts: (I) perceptions, attitudes, and willingness to purchase, and (II) visual attention allocation. Part I details the impact of food label claims and how the clean label trend has established itself as a leading influence for

purchase decisions for younger generations. Part II describes visual attention allocation to food label claims and how they contribute to further processing of the information included.

### **Part I: Perceptions, Attitudes, and Willingness to Purchase**

The clean label trend has spiked in recent years, with increasing interest in the attributes encompassed by clean labels (Label Insight, 2016, 2017; The Nielsen Company, 2017). Multiple factors influence how a consumer interacts with food products, leading to different purchasing and consumption habits between individuals (McCluskey & Loureiro, 2003; Teisl & Levy, 1997; Wansink et al., 2004). To develop an idea of how the clean label trend is influenced by consumer attitudes, this study sought to understand participants' pre-existing attitudes regarding food consumption and packaging.

**RQ<sub>1</sub>:** What were participants' pre-existing attitudes regarding food consumption and packaging?

Previous research has indicated that in order for food label claims to be influential, consumers must recognize the topic and understand the relationship between their needs and the benefits being promoted by the label claim (Lähtenmäki, 2013). As formal clean labels are relatively new to the market, there is little knowledge of the meaning of the label without further explanation included on the packaging (Gelski, 2016). In addition, variations among text and visual elements must lend themselves to the credibility of the label, encouraging the consumer to process the contained information (Silayoi & Speece, 2004). Therefore, this study sought to understand how, if at all, participant attitudes varied between the four label conditions.

**RQ<sub>2</sub>:** What were participants' attitudes regarding clean labeled products?

With interest in the attributes of clean label products increasing, the composition of the label is an important influence in the development of perceptions regarding clean label foods (Asioli, Aschemann-Witzel, et al., 2017). In order to promote a purchase decision, labels must effortlessly communicate the attributes of clean label products in a way that is easily understandable (Silayoi & Speece, 2004). The structure of a claim has been found to affect how the claim is received, as heuristics allow information to be processed using previous knowledge without the need for much cognitive effort (Hoek et al., 2013). Thus, the researcher sought to understand consumer perceptions of the clean label products after viewing the images, as well as the impact that clean labels had on willingness to pay for clean label products.

**RQ<sub>3</sub>:** How did participants' perceptions of the clean label design vary between label design and product type?

**RQ<sub>4</sub>:** How did the participants' willingness to pay for clean label products vary between label conditions?

As clean labels appear on an increasing and varied amount of food packages, it must be understood how consumers are using these labels. For labels to successfully function as a marketing tactic, consumers must have a desire to purchase products with certain attributes that are seen as beneficial (Lähteenmäki, 2013). Labels that are associated with deceptive marketing practices often promote fewer purchase decisions, making the proper use of a label important (McFadden & Huffman, 2017). Ultimately, a company's use of the clean label affects how consumers interact with clean label products (Katz & Williams, 2011). Therefore, this study sought to understand participants' perceptions and attitudes regarding the use of clean labels on food products.

**RQ<sub>5</sub>:** What are the participants' perceptions and attitudes regarding the use of clean labels?

## **Part II: Visual Attention Allocation**

Visual attention is a powerful indicator of elements that need to be processed, and can be used to determine the effectiveness of a persuasive message (Wedel & Pieters, 2008). Food label claims are seen as a persuasive message and heuristic cue as they provide an argument for purchase that allows consumers to make a quick decision regarding the product (Hoek et al., 2013). Visual heuristic cues are particularly influential as they do not require complex cognitive processing in order to make a decision, while verbal cues provide an avenue for systematic processing of a message (Townsend & Kahn, 2014). Therefore, it is hypothesized that visual attention allocation will differ significantly based on label design.

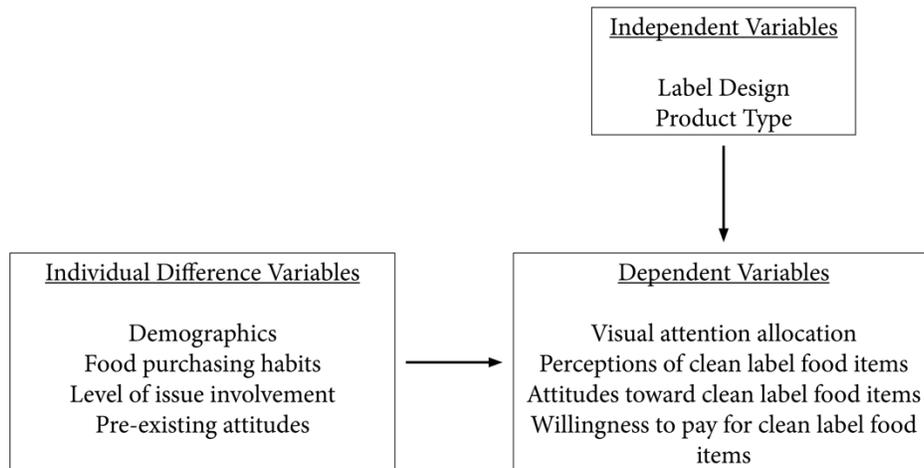
**H<sub>1</sub>:** Visual attention allocation will differ significantly based on label design.

Attention is a necessary element for information to be processed quickly and accurately (LaBerge, 1995). By measuring the amount of attention directed at package elements, the consumer's use of package elements toward a purchase motivation can be measured (Van Loo et al., 2018). This gives marketers the ability to determine the information formulation and delivery methods that contribute to effective messaging strategies persuading the consumer to buy (Van Loo et al., 2018). Utilizing this information, the researcher sought to determine how much visual attention was directed to the clean label as a package element.

**RQ<sub>6</sub>:** How much visual attention is directed at the clean label when viewing different food products?

### Research Design

This study was accomplished through a quantitative, experiential design that examined the effects of label format and statements—which encompass the meaning of clean labels as they are displayed on food packaging—and explored how consumers perceive the clean label in regard to their food purchasing decisions. This experiment followed a 2 (visual: logo vs. statements) x 2 (verbal: yes vs. no) x 2 (product type: chips vs. granola bar) within- and between-subjects factorial design with a control. The operational framework can be seen in Figure 3.1.



*Figure 3.1.* Operational framework for the current study

This design was chosen to enable a cohesive assessment of the independent variables’ interaction with multiple dependent variables (Fraenkel, Wallen, & Hyun, 2015). Visual label design and verbal statements were selected as independent variables because previous research has shown the design and appearance of a label to contribute to information processing, and ultimately, purchase decisions (Wansink et al., 2004). Visual elements of a label are more likely to be processed heuristically, while verbal elements

correspond with a systematic method of processing (Silayoi & Speece, 2004). Delivering information in a manner that fits with each consumers' processing style impacts their desire to purchase a product (Silayoi & Speece, 2004). Product type was selected as an additional independent variable because messaging effectiveness has been shown to vary between products (Jeong & Lundy, 2015). Chips and a granola bar were chosen as the two product types to determine if a difference existed between the perception of the label among products that elicit distinct biases from the consumer. Product type served as the within-subjects variable, while the between-subjects variables were visual label design and verbal statements.

Participants saw both of the product packages with one of the label types, depending on their randomly-assigned treatment group. The label types were: 1) a designed clean label including statements, 2) designed clean label with no statements, 3) statements only, or 4) a control with no label claim information.

The experiment included a pre-test survey, followed by exposure to eye-tracking stimuli and a post-test survey. First, participants were prompted to answer the initial survey questions. The pre-test survey was used as a method of collecting data regarding participants' demographics and general food purchasing habits. Next, participants took part in an eye-tracking exercise. During this portion of the experiment, participants were asked to focus their eyes on a screen before being exposed to 10 different food packages. Through the eye-tracking segment of the experiment, the researcher was able to track visual attention allocation to the label to determine how it relates to consumer

perceptions, understanding, and motivations to purchase, which is explained in more detail below.

After participants completed the eye-tracking segment, they were asked to complete a post-survey to measure their immediate responses to five of the stimuli they viewed, including the two packages with their assigned treatment. Measuring participant responses to the stimuli immediately following helped to understand how exposure to the stimuli affected their perceptions, understanding, and motivations to purchase clean label food items. Specific questions about clean labels were asked in the post-test survey in order to minimize any priming effect.

### **Population and Sample**

The population for this study was undergraduate and graduate university students, between the ages of 18-38. This population was selected due to the current rise in Millennial and Generation Z interest in food ingredient transparency (Rosenbloom, 2018). For the purpose of this study, the Millennial age range was defined as individuals born from 1981 to 1996, while Generation Z was considered as anyone born from 1997 to 2012 (Dimock, 2019). The Millennial generation considers the source of their food more than previous generations, and their definition of healthy food likely includes natural, organic, locally sourced, or sustainable (Hoffman, 2012; Rosenbloom, 2018; The Nielsen Company, 2017). They are less concerned with brand loyalty while being more concerned about the ethics of their food, steering toward smaller producers and being more willing to shop at multiple locations to find the exact products they are looking for (Hoffman, 2012). As Generation Z begins to reach the age of making their own food

purchasing decisions, they are predicted to hold the same food consumption values as Millennials. Generation Z consumers are focused on clean eating, as they believe it is a factor in improved quality of life and aligns with their image of health (The NPD Group, 2018). Current college students fall into the between these two generations, carefully considering the extrinsic qualities of their foods, which may lead to concern about their food following clean label guidelines.

A sample of undergraduate and graduate students from Texas Tech University was used for this study. Approval was obtained from the Texas Tech University Institutional Review Board before data collection began (see Appendix A). A total of 120 students were recruited from multiple colleges within the university. Participants were recruited through the university announcement service, TechAnnounce, as well as announcements in undergraduate and graduate classes. Participants were awarded a \$20 cash incentive for their participation.

The researcher collected data from 120 participants. Three participants were removed from the overall sample due to not meeting the age requirement, resulting in a final sample of 117. A total of 30 participants were randomly exposed to each label condition. After data reduction, 29 participants were exposed to the designed clean label with no statements, 30 were exposed to the designed clean label with statements, 30 were exposed to the statements only, and 28 were exposed to the control (Table 3.1). No participants were removed from the sample due to their eye-tracking data as all participants were above the 70% threshold for weighted gaze sample.

Table 3.1

*Label Condition Exposure (N = 117)*

Label Condition	Frequency
Designed Clean Label, No Statements	29
Designed Clean Label, With Statements	30
Statements Only	30
Control, No Label or Statements	28

**Participant Demographics**

The pre-test questionnaire included questions to assess the demographics of participants (Table 3.2 displays the complete results). Females accounted for the majority of participants at 70.1% ( $n = 82$ ), while males accounted for 29.9% ( $n = 35$ ). A majority of participants, 52.1% ( $n = 61$ ), fell within the 18-22 age range, while 29.1% ( $n = 34$ ) were between 23-26, 11.1% ( $n = 13$ ) were between 27-30, 5.1% ( $n = 6$ ) were between 31-34, and 2.6% ( $n = 3$ ) fell between 35-38. A total of 41.9% ( $n = 49$ ) of participants were graduate students, 40.2% ( $n = 40.2$ ) were classified as seniors, 14.5% ( $n = 17$ ) were classified as juniors, and 3.4% ( $n = 4$ ) were classified as sophomores.

Most participants identified their political ideology as moderate (27.4%,  $n = 32$ ) or somewhat liberal (27.4%,  $n = 32$ ). The remaining participants identified as being very liberal (17.9%,  $n = 21$ ), somewhat conservative (17.9%,  $n = 21$ ), very conservative (5.1%,  $n = 6$ ), or preferred not to answer (4.3%,  $n = 5$ ). A total of 41.9% ( $n = 49$ ) identified with the Democratic party, while 25.6% ( $n = 30$ ) identified with the Republican

party. The remaining participants identified as independent (20.5%,  $n = 24$ ) or preferred not to answer the question (12.0%,  $n = 14$ ).

Table 3.2

*Demographic Characteristics of Participants (N = 117)*

Characteristic	Frequency (n)	Frequency Percent (%)
<b>Gender</b>		
Female	82	70.1
Male	35	29.9
<b>Age Range</b>		
18-22	61	52.1
23-26	34	29.1
27-30	13	11.1
31-34	6	5.1
35-38	3	2.6
<b>Academic Classification</b>		
Freshman	0	0
Sophomore	4	3.4
Junior	17	14.5
Senior	47	40.2
Graduate Student	49	41.9
<b>Political Ideology</b>		
Moderate	32	27.4
Somewhat liberal	32	27.4

Table 3.2 (continued)

Very liberal	21	17.9
Somewhat conservative	21	17.9
Very conservative	6	5.1
Prefer not to answer	5	4.3
Political Party		
Democrat	49	41.9
Republican	30	25.6
Independent	24	20.5
Prefer not to answer	14	12.0

Participants were asked to indicate their food consumption characteristics and purchase habits (Table 3.3). A majority of participants indicated they follow an omnivore diet (76.9%,  $n = 90$ ). Eighty-six percent ( $n = 101$ ) of participants specified they were the primary grocery shopper in their household, while 13.7% ( $n = 16$ ) were not. A total of 44.4% ( $n = 52$ ) of participants visited the grocery store once a week, while 29.1% ( $n = 34$ ) visited every other week, 18.8% ( $n = 22$ ) went to the grocery store twice a week, and 7.7% ( $n = 9$ ) only visited the grocery store once a month.

A majority of participants primarily purchased their food from the grocery store (84.6%,  $n = 99$ ), while 6.8% ( $n = 8$ ) purchased their food at fast food locations, 5.1% ( $n = 6$ ) purchased food at a dining hall, and 3.4% ( $n = 4$ ) purchase their food at casual/sit-down restaurants. Finally, participants were asked to indicate whether they consult FOP labels when making their purchase decision. Forty-three percent ( $n = 40$ ) indicated they

often utilize FOP labels, while 32.5% ( $n = 38$ ) sometimes utilized FOP labels, 18.8% ( $n = 22$ ) utilized FOP labels most of the time, 7.7 % ( $n = 9$ ) rarely used FOP labels, and 6.8% ( $n = 8$ ) hardly ever used FOP labels.

Table 3.3

*Food Consumption Characteristics and Purchase Habits of Participants (N = 117)*

Characteristic	Frequency (n)	Frequency Percent (%)
<b>Specific Diet</b>		
Omnivore	90	76.9
Other	13	11.1
Gluten-Free	6	5.1
Vegan	4	3.4
Vegetarian	3	2.6
<b>Primary Grocery Shopper</b>		
Yes	101	86.3
No	16	13.7
<b>Grocery Shopping Frequency</b>		
Once a Week	52	44.4
Every Other Week	34	29.1
Twice a Week	22	18.8
Once a Month	9	7.7
<b>Food Purchase Location</b>		
Grocery Store	99	84.6
Fast Food	8	6.8

Table 3.3 (continued)

Dining Hall	6	5.1
Casual/Sit-down Restaurant	4	3.4
Consult Front-of-Package Labels		
Often	40	43.2
Sometimes	38	32.5
Most of the Time	22	18.8
Rarely	9	7.7
Hardly Ever	8	6.8

### **Instrumentation**

#### **Pre-Test Questionnaire**

Participants were asked to take both a pre-test questionnaire and a post-test questionnaire to capture their impressions of the clean label before and after being exposed to the eye-tracking stimuli. The questionnaires can be found in Appendix C. Both survey instruments were created in Qualtrics and reviewed by a panel of faculty members within the Texas Tech University Department of Agricultural Education and Communications. The pre-test questionnaire contained questions about demographics, food purchasing habits, level of issue involvement, and pre-existing attitudes. Demographic questions asked were gender, age, academic classification, major, and political views. Food purchasing habits were measured, specifically frequency of grocery shopping, specific diet, and the location of food purchases.

To measure issue involvement, participants were asked to rank their ingredient concern (1 = *Very concerned* to 5 = *Not concerned at all*). Adapted from Lähteenmäki's (2013) findings, participants were asked to rank their level of agreement with 10 factors that may affect a purchase decision: "quality," "taste," "price," "package information," "brand recognition," "product recognition," "health," "convenience," "nutrition label," and "recommendations from friends and family."

To capture the participants' pre-existing beliefs about the characteristics associated with clean label foods, they were asked to rank their agreement (1 = *Strongly disagree* to 5 = *Strongly agree*) to the following factors as influencing their consumption habits: "organic," "non-GMO," "free from artificial ingredients," "natural," "local," "minimally processed," and "free from pesticides, chemicals, and toxins."

Participants were also asked to rank their agreement (1 = *Strongly disagree* to 5 = *Strongly agree*) with several statements pertaining to package elements: "A simply/short ingredient list," "food company packaging," "transparent packaging," sustainability messages," and "food origin."

An additional issue involvement question was adapted from Knebel's (2015) study on consumer perceptions of FOP labels. Participants were asked to rank their agreement (1 = *Strongly disagree* to 5 = *Strongly agree*) for each of the following statements: "The health claims and nutrition information on the front of packages help me decide what to purchase," "The health claims and nutrition information on the front of food packages help me make purchase decisions when I'm in a hurry," "I pay more attention to health and nutrition claims on the front of food packages when I have time to

read them while grocery shopping,” and “I understand the meanings of health claims found on food packages.”

### **Eye-Tracking Experiment**

The eye-tracking segment of the experiment was conducted in a laboratory setting because it allows a greater amount of control than can be attained in a field setting (Duchowski, 2017). The two product types tested were potato chips and a granola bar. These items were selected due to their higher processing level and consumer expectation that each item wouldn't normally be associated with clean eating. Salty snacks represented the biggest share of the clean label market in 2017, with nearly \$200 million in sales (The Nielsen Company, 2017). Wholesome snacks had just over \$50 million in sales, but were growing (The Nielsen Company, 2017). The researcher designed mock product images for each treatment (see Figures 3.2 and 3.3). Each product image had four variations including a clean label with descriptors, a clean label without descriptors, descriptors only, and a control with no label claim information.



*Figure 3.2.* Potato chips stimuli with all four treatments



Figure 3.3. Granola bar stimuli with all four treatments

The clean label design is displayed as a green circle with the term “clean label” as well as a plant, referring to the natural aspect of clean labeling (see Figure 3.4). Green was chosen for the design as consumers perceive green labels to indicate a higher level of health as opposed to other labels (Schuldt, 2013). The descriptors listed include “natural,” “organic,” “non-GMO,” and “free-from artificial ingredients” as previous research has shown these three categories to be the most frequently associated with the clean label category (Gelski, 2016). The descriptors were removed from the label when testing the clean label by itself or listed individually for the descriptors only stimuli.



Figure 3.4. Clean label designs

### **Post-Test Questionnaire**

The post-test questionnaire was used to measure participants' perceptions of the products they were exposed to, attitudes toward clean label products, as well as their motivations to purchase clean label food items. To ensure participants viewed the same images as the eye-tracking experiment, the post-test questionnaire was divided into four separate instruments based on the four treatments. Each questionnaire contained the same questions with the only difference being the images shown to participants. The researcher opened the correct questionnaire for the participant to ensure they answered questions about the images previously viewed. To begin the questionnaire, participants were given a free-response question asking to provide their knowledge of clean labels, to the best of their ability.

From there, participants were asked to rate their perceptions and willingness to purchase for five of the package images they viewed. This included their two randomized treatment images and three of the foil images. To determine perceptions of the products, several questions were adapted from a study by Cantrell (2019) that measured consumer perception of products with gluten-free labels. Presented with one of the five images, participants were asked to indicate their agreement (1 = *Strongly disagree* to 5 = *Strongly agree*) with several statements about the product: "The ingredients in this product are safe," "The ingredients in this product are healthy," "The ingredients in this product are nutritious," "The ingredients in this product are unhealthy," and "The ingredients in this product are clean." Reliability was established as  $\alpha = .842$ .

Next, participants were asked to indicate their agreement (1 = *Strongly disagree* to 5 = *Strongly agree*) with several statements about the label shown on the packaging: “The label is informative,” “The label is misleading,” “The label is well designed,” and “The label is credible.” An additional statement, “The label made me concerned about the ingredients in my food,” was removed due to a corrected item-total correlation of -.401 for the chips and -.483 for the granola bar. Reliability for the final 4-item scale was established as  $a = .856$ .

Finally, participants were asked to provide the highest price they would be willing to pay for a product. For both the potato chips and granola bar, the price options were \$1.49, \$1.99, \$2.49, \$2.99, or none at all. These three questions were repeated for the five images included in the survey. In addition to answering questions about the potato chips and granola bar, participants also answered questions about a bag of mixed nuts, a loaf of bread, and a package of ground chicken. These additional images were in the post-test questionnaire to ensure participants were not focused on the clean label products.

The post-test questionnaire concluded with several questions regarding participant knowledge of clean labels and their perceptions of the label after viewing the product images. First, participants were asked how often they consult FOP labels while grocery shopping (1 = *Hardly ever* to 5 = *Most of the time*). Adapted from Cantrell (2019), participants were also asked to provide their level of agreement (1 = *Strongly disagree* to 5 = *Strongly agree*) with several statements about clean label foods: “Clean label food products are healthy,” “Clean label food products are nutritious,” and “Clean label food products are unsafe.” Cantrell (2019) established reliability for this measure as  $a = .900$ ,

while the reliability in this study was  $a = .795$ . In addition, participants were asked to indicate their level of agreement (1 = *Strongly disagree* to 5 = *Strongly agree*) with various statements regarding clean label products: “Clean label products are more nutritious,” “Clean label products make me feel healthier,” “Clean label products are safer,” “Food products with artificial ingredients can present health risks,” “Eating products with artificial ingredients can increase the likelihood of developing food allergies,” and “Eating products with artificial ingredients can increase the likelihood of developing serious diseases.” Cantrell (2019) established Reliability for this measure as  $a = .875$ . Finally, participants were asked to indicate their agreement (1 = *Strongly disagree* to 5 = *Strongly agree*) with several statements related to the clean label product images they viewed: “This label should be mandatory for all ‘clean’ products,” “I support the use of this label for products that do not naturally contain artificial ingredients,” and “This label should only be used for products that might otherwise contain artificial ingredients.”

### **Procedure and Data Collection**

#### **Complete Procedure**

In individual sessions, participants were asked to sit at a computer and directed to complete the pre-test questionnaire. After completing this, participants were instructed to sit approximately 24-inches in front of the eye-tracking monitor. A Tobii X2-60 Eye-Tracker control unit was placed directly below the screen and monitored their eye movements throughout the experiment. Eye-tracking is utilized as a method to help understand how eye movements relate to a viewer’s attention towards a certain element (Duchowski, 2017). This methodology reflects light from the viewer’s cornea to identify

a point of gaze, which identifies elements such as viewing pattern and fixation duration (Duchowski, 2017). In the context of this study, eye-tracking allowed the researchers to understand how much attention consumers direct to the labels. Participants began the eye-tracking phase by calibrating their eyes by following a moving dot on the screen. They were instructed to refrain from moving both their head and the rest of their body during calibration and while viewing the images. After calibration was complete, participants viewed each stimulus at their own pace, although they were instructed to take their time to thoroughly view each image.

Participants were randomly assigned a treatment group, which determined the set of 10 images they viewed. Each set of images contained the same eight foil images with the only changes being the clean label format and statements included on the images of the potato chips and granola bar. Foil images of other food packages were randomized between the stimuli to ensure participants are not focusing directly on the label when viewing each package. After participants finished looking at the eye-tracking stimuli, they were directed to take the post-test questionnaire (Kuchler et al., 2017).

### **Data Analysis**

Once collected, data from the questionnaire were exported from Qualtrics into IBM SPSS v.25 for analysis. Participants were assigned numbers in order to match eye-tracking data with questionnaire responses. Descriptive statistics, including frequencies and percentages, were used to analyze the demographic survey responses. Answers from the free response question were coded. The researcher developed a codebook for the free response question and answers were coded according to their themes. Themes were

developed in accordance with participant responses and previous research supporting the consumer knowledge of clean label products (e.g. Asioli, Aschemann-Witzel, et al., 2017). Per recommendations from Duchowski (2017), ANOVA and ANCOVA tests were conducted to measure the effect of the clean labels on consumer perceptions of the tested packaging. As part of the ANOVA analysis, group means and standard deviations were calculated for each Likert-type item. A paired samples *t-test* was calculated to determine if any differences exist between perceptions of different products. An independent samples *t-test* calculated differences in visual attention that existed between those with a high knowledge level of clean labels and those with a low knowledge level.

Data from the eye-tracking segment was gathered through the Tobii Studio software system, exported into Microsoft Excel, and imported into SPSS for analysis. To analyze the eye-tracking data, an AOI was added to each package where the label was placed or would have been placed in the case of the control packaging. Using Tobii Studio, total fixation duration and fixation count were calculated for each label condition, as well as for the two products.

### **Summary**

A 2 (visual: logo vs. statements) x 2 (verbal: yes vs. no) x 2 (product type: chips vs. granola bar) within- and between-subjects factorial design with a control was used to meet the needs of this study. Participants completed a pre-test questionnaire, eye-tracking experiment, and post-test questionnaire to measure their knowledge, perceptions, and purchase motivations toward clean labels. The participants in this study were Millennial and Generation Z undergraduate and graduate students at Texas Tech University. In

individual sessions, data were gathered from 120 participants between June 2019 to August 2019. Data were analyzed using descriptive and inferential statistics.

## **CHAPTER IV**

### **RESULTS**

#### **Overview**

The purpose of this study was to measure visual attention allocation to and knowledge of clean labels to determine how those variables affect consumers' attitudes and perceptions toward and willingness to pay for clean label food items. Through the conceptual framework of the Heuristic-Systematic Model of Processing, the use of food label claims as heuristics and their influence on visual attention was examined. This study was divided into two parts: (I) perceptions, attitudes, and willingness to purchase and (II) visual attention allocation. This chapter provides an analysis of the data, beginning with a discussion of participants' pre-existing attitudes regarding food consumption. In addition, this chapter will explore participants' attitudes and perceptions toward clean labeled products, as well as their willingness to pay and visual attention allocation.

#### **Pre-existing Attitudes**

Through individual sessions, the pre-test and post-test questionnaires were distributed to 120 participants. Three participants were removed from the sample due to not meeting the maximum the age requirement. The final sample size was 117. RQ<sub>1</sub> aimed to describe participants' pre-existing attitudes regarding food consumption and packaging. Participants were asked several questions about their food consumption attitudes, packaging elements, whether they use label claims, and factors that contribute to their overall purchase decisions.

## **Food Consumption**

Pre-existing attitudes surrounding food consumption were measured to understand attributes of food products participants consider important when making food choices. Each characteristics included in this 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*) was derived from previous research indicating terms commonly associated with clean label foods (The Nielsen Company, 2017).

In regard to what is important when making food choices, participants most strongly agreed they select foods that are free from pesticides, chemicals, and toxins ( $M = 3.99$ ,  $SD = 1.01$ ) and minimally processed ( $M = 3.91$ ,  $SD = .788$ ), while natural foods ( $M = 3.78$ ,  $SD = .732$ ), foods that are free from artificial ingredients ( $M = 3.40$ ,  $SD = .992$ ), and local foods ( $M = 3.32$ ,  $SD = .891$ ) resulted in lower agreement from participants. Foods that were non-GMO ( $M = 2.96$ ,  $SD = 1.07$ ) and organic ( $M = 2.91$ ,  $SD = .851$ ) had the lowest means, indicating participants were less likely to seek out foods with these characteristics when making their food consumption decisions.

In addition, participants were asked to rate their concern regarding ingredients when selecting foods for consumption, using a 5-point Likert-type scale (1 = *very concerned*, 5 = *don't know*). Overall, participants indicated they were either very concerned ( $n = 12$ , 10.3%), fairly concerned ( $n = 68$ , 58.1%), or not very concerned ( $n = 37$ , 31.6%) about the ingredients in their food.

## **Packaging**

To measure pre-existing attitudes regarding packaging elements, participants were asked to rank their agreement with recognizing several common package elements using

a 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*). When making food consumption decisions, participants agreed they look for each of the packaging elements identified in the questionnaire. They most strongly agreed they look for a simple/short ingredient list ( $M = 4.03$ ,  $SD = .77$ ). This was followed by food origin ( $M = 3.90$ ,  $SD = .81$ ), transparent packaging ( $M = 3.61$ ,  $SD = .93$ ), sustainability messages ( $M = 3.59$ ,  $SD = .88$ ), and food company branding ( $M = 3.53$ ,  $SD = .93$ ).

### **Label Claims**

Pre-existing attitudes surrounding health claims and nutrition labels on packaging were measured using a 5-point Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*) adapted from Knebel's (2015) study on consumer perceptions of FOP labels. Participants were asked to rank their agreement to four statements about health claims and nutrition information being included on the front of food packaging. Participants indicated they pay more attention to health and nutrition claims on the front of food packages when they have time to read them while grocery shopping ( $M = 3.91$ ,  $SD = 1.06$ ). They indicated a similar agreeance that the health claims and nutrition information on the front of food packages help them decide what to purchase ( $M = 3.54$ ,  $SD = 1.07$ ) and they understand the meanings of health claims found on food packages ( $M = 3.58$ ,  $SD = 1.00$ ). Finally, participants indicated the health claims and nutrition information on the front of packages help them make decisions when they are in a hurry ( $M = 3.15$ ,  $SD = 1.07$ ).

## Purchase Decisions

Intrinsic and extrinsic factors were measured to determine the participants' food quality formation, which ultimately affects purchase decisions. Adapted from Lähteenmäki's (2013) findings, participants were asked to rank their agreement with 10 intrinsic and extrinsic factors through a 5-point Likert-type scale (Table 4.1). Participants indicated they consider taste ( $M = 4.56$ ,  $SD = 0.56$ ), price ( $M = 4.49$ ,  $SD = 0.73$ ), and quality ( $M = 4.37$ ,  $SD = 0.61$ ) as the top factors when making purchase decisions. The remaining factors considered can be viewed below.

Table 4.1

*Factors Considered When Making Food Purchase Decisions (N = 117)*

Factors	<i>M</i>	<i>SD</i>
Taste	4.56	0.56
Price	4.49	0.73
Quality	4.37	0.61
Health	4.09	0.84
Convenience	4.02	0.87
Recommendations from friends and family	3.60	1.09
Nutrition Label	3.57	1.13
Product Recognition	3.52	0.96
Package Information	3.42	1.01
Brand Recognition	3.04	1.04

*Note: 1 = Strongly disagree, 5 = Strongly agree*

### **Attitudes Regarding Clean Labeled Products**

RQ<sub>2</sub> sought to identify participants' attitudes regarding clean labeled products. Several questions were asked in the post-questionnaire to assess participants' attitudes toward the clean label products they viewed during the eye-tracking experiment. Directly following their eye-tracking experiment, participants were asked to provide any information they know about clean label products. Following the free-response question, participants were asked to indicate their attitudes toward two of the clean label products viewed, based on their assigned label condition.

A free response question was utilized directly following the eye-tracking experiment to capture participants' initial reactions about the clean label products they viewed, as well as anything else they knew about clean labels. The researcher identified 12 distinct themes among the responses and each response was coded accordingly into one category (Table 4.2).

Table 4.2

*Participants' Knowledge of Clean Labels (N = 117)*

Code	Condition 1 Frequency	Condition 2 Frequency	Condition 3 Frequency	Condition 4 Frequency	Total Frequency
Don't know, never heard of it, or blank	5	7	9	9	30
Associated clean label with packaging features	8	6	7	8	29
Described 1-2 attributes of a clean label	2	6	7	8	12
Knew most of the attributes of a clean label	1	5	1	1	8
Associated with quality or origin	2	2	3	1	8
Provides consumers with truthful information and/or isn't misleading	2	1	2	3	8
Associated with nutrition panel or nutrition information	1	0	3	2	6
Associated with sustainability/environment	3	0	1	0	4
Associated with the product being free from chemicals and/or pesticides	3	0	0	0	3

Table 4.2  
(continued)

Referenced the label featured on the stimuli	1	1	1	0	3
Associated with marketing tactics or organization-supported labels	0	1	1	1	3
Corresponded with multiple categories	1	1	1	0	3

Two themes emerged as the most common responses; participants either did not know what a clean label was, had not heard of it, or left the question blank ( $n = 30$ ), or they associated clean labels with packaging features (e.g. packaging that has no marketing elements or only lists necessary information) ( $n = 29$ ). For example, one participant referencing packaging said, “clean labels show just the product and the product name. Nothing else,” while another participant said, “clean labels show what’s inside the packaging.”

Participants who described one to two attributes of clean label products ( $n = 12$ ) mentioned the food being organic, non-GMO, or free from artificial ingredients. One participant said:

When I see something that has a "clean label" I start by thinking about food that is processed in the most ethical way possible as well as food that does not have artificial flavors. I also think about food that isn't overly processed. In my mind clean=healthy and ethical.

Several participants named most of the attributes associated with clean labels ( $n = 8$ ). Responses in this category included more than two attributes typically associated with clean labels. A participant response said, “clean labels do not contain any artificial ingredients. They are natural and minimally processed,” while another participant mentioned, “They are non-GMO, organic, and do not have artificial flavors or preservatives.”

An additional theme that emerged included the clean label as a quality marker for consumers to quickly assess the product quality or origin ( $n = 8$ ). One participant said, “clean labels are labels that give the most important information about what is in the food and the quality/goodness of the food for you.” Another participant mentioned clean labels as being a quality marker specifically for agricultural products, saying clean labels are, “labels on food that tell you how the food was made. If it organic, non-GMO, natural, pesticide free, etc. Clean labels usually go on agriculture products like crops and livestock.”

Providing consumers with truthful information without deceptive intentions was an additional theme that emerged through the participant respondents ( $n = 8$ ). The responses with this theme typically mentioned the relationship, or lack thereof, between consumers and companies. One participant said, “I think that they are there to inform the consumer of the benefits of what they are consuming,” while another participant said, “I’ve always been interested in the disconnect between food quality and marketing. Personally, the more health claims I see on a label the more wary I am of it.”

Several participants associated clean labels with nutrition information or the nutrition panel found on the back of food packages ( $n = 6$ ). These responses focused on a clean label providing the ingredients, but also included responses with clean labels providing serving size, calories, and other nutrition information. One participant said, “clean labels detail the ingredients and nutritional facts about the enclosed food,” while another participant said, “Clean labels include serving size, calories per serving, percentages of fat (unsaturated/saturated/trans), sugar, etc. and list ingredients beginning from the most to least amount.”

The remaining responses fell into four themes: associated the product with being free from chemicals and/or pesticides ( $n = 3$ ), referenced the label featured on the stimuli ( $n = 3$ ), associated with marketing tactics or organization-supported labels ( $n = 3$ ), or corresponded with multiple categories ( $n = 3$ ).

After viewing the stimuli, participants were tasked with answering several questions about the images they viewed. In particular, participants were asked about their attitudes toward the clean label products they viewed, including whether the product is safe, healthy, and nutritious. These five Likert-type questions (1 = *strongly disagree*, 5 = *strongly agree*) were combined into one construct, attitudes of clean label products. The grand mean for this construct was 3.22.

As RQ<sub>2</sub> aimed to understand attitudes regarding clean label foods in general, a one-way ANOVA was conducted to analyze any difference in attitudes that might have existed between the four label conditions. The alpha level was set *a priori* at .05. As part

of the ANOVA, group means and standard errors were calculated for the attitudes between labels.

The ANOVA showed significant differences among the attitudes toward clean labels between the four conditions ( $F = 14.15, p < .001$ ) (Table 4.3). The group means showed participants who viewed the “statements only” condition reported the highest consideration for the safety, healthiness, and nutrition of the clean label products ( $M = 3.47, SD = .441$ ), while those who viewed the “clean label with statements” followed closely ( $M = 3.43, SD = .591$ ) (Table 4.4). Participants who viewed packages without the clean label had the lowest attitudes regarding the safety, healthiness, and nutrition of the clean label product ( $M = 2.77, SD = .384$ ).

Table 4.3

*ANOVA of the Effects of Label Conditions on Attitudes Towards Clean Labels*

Source	SS	df	MS	$F_{(3, 113)}$	P
Between Groups	8.875	3	2.958	14.15	<.001
Within Groups	23.624	113	.209		

Table 4.4

*Group Means of Attitudes Between Label Conditions (N = 117)*

Label Condition	M	SD
1. Clean Label – No Statements	3.16	.372
2. Clean Label – Statements	3.43	.591
3. Statements Only	3.47	.441
4. No Label	2.77	.384

A Bonferroni comparison was conducted to determine where significance existed between the label conditions. The comparison showed a significant difference between the package without a label (control) and “clean label without statements” ( $p = .009$ ), “clean label with statements” ( $p < .001$ ), and “statements only” ( $p < .001$ ).

### **Perceptions of Clean Labels**

RQ<sub>3</sub> sought to understand participants’ perceptions of the clean label between label types and product type. To measure perceptions of the label presented on packaging, participants were asked a series of four Likert-type questions about the credibility, design, and informational aspect of the label. These four questions combined into one construct, perceptions of the clean label. The grand mean for this construct was 2.75. A paired samples  $t$ -test was run to determine if differences existed in the perceptions of the label between product types. The  $t$ -test showed a statistically significant difference in perceptions of clean labels between the two products ( $t_{116} = -4.73, p < .001$ ). The mean perceptions score for the granola bar was 2.87, compared to chips with a mean perception score of 2.64.

An ANOVA was conducted to analyze differences between perceptions of the four label conditions. The alpha level was set *a priori* at .05. Group means were calculated for perceptions between product types (Table 4.5). Overall, group means for the granola bar were higher among all four label conditions. For chips, the highest mean came from participants who viewed the statements only ( $M = 2.96, SD = .816$ ), while those who viewed the clean label with statements had the highest mean for the granola bar ( $M = 3.35, SD = .877$ ).

Table 4.5

*Group Means of Perceptions Between Product Type (N = 117)*

Label Condition	<u>Chips</u>		<u>Granola Bar</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. Clean Label – No Statements	2.44	.558	2.71	.594
2. Clean Label – Statements	2.89	.850	3.35	.877
3. Statements Only	2.96	.816	3.11	.759
4. No Label	2.21	.556	2.27	.713

*Note:* 1 = *strongly disagree*, 5 = *strongly agree*

As the *t*-test found a statistically significant difference between the two products, individual one-way ANOVAs were run for each product to account for where the differences exist. The one-way ANOVA for the chips found a statistically significant difference between the four label conditions ( $F = 7.38, p < .001$ ) (Table 4.6). A Bonferroni comparison showed significance between “clean label without statements” and “statements only” ( $p = .035$ ). In addition, significance existed between the control and “clean label with statements” ( $p = .003$ ) and “statements only” ( $p = .001$ ).

Table 4.6

*ANOVA of the Effects of Label Conditions on Perceptions Towards Clean Labels on Chip Products*

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	$F_{(3, 113)}$	<i>P</i>
Between Groups	11.229	3	3.743	7.379	<.001
Within Groups	57.322	113	.507		

Table 4.7

*ANOVA of the Effects of Label Conditions 1-3 on Perceptions Towards Clean Labels on Chip Products*

Source	SS	df	MS	$F_{(2, 86)}$	P
Between Groups	4.704	2	2.352	4.129	.019
Within Groups	48.983	86	.570		

The one-way ANOVA for the granola bar also found a statistically significant difference between the four label conditions ( $F = 11.746, p < .001$ ) (Table 4.8). A Bonferroni comparison showed statistical significance between “clean label without statements” and “clean label with statements” ( $p = .007$ ). In addition, the control had statistical significance with the “clean label with statements” ( $p < .001$ ) and the “statements only” ( $p < .001$ ).

Table 4.8

*ANOVA of the Effects of Label Conditions on Perceptions Towards Clean Labels on Granola Bar Products*

Source	SS	df	MS	$F_{(3, 113)}$	P
Between Groups	19.540	3	6.513	11.746	<.001
Within Groups	62.660	113	.555		

### Willingness to Pay

RQ<sub>4</sub> sought to understand participants’ willingness to pay for clean label products between label conditions. As both the chips and granola bar have similar pricing structures, the same four prices were chosen for each product. Participants were asked to

choose the highest price they would pay for each item or indicate if they would not purchase the product. Frequencies for each price level between products are displayed below (Table 4.9).

Table 4.9

*Willingness to Pay for Clean Label Chips and Granola Bar by Price (N = 117)*

Price	Chips		Granola Bar	
	<i>f</i>	%	<i>f</i>	%
\$1.49	64	54.7	66	56.4
\$1.99	33	28.2	25	21.4
None at all	15	12.8	20	17.1
\$2.49	4	3.4	6	5.1
\$2.99	1	0.9	0	0.0

A crosstabs analysis revealed participants who viewed each label condition were willing to pay different prices for the chips ( $\chi^2(12, N = 117) = 25.919, p = .011$ ), while no statistical significance existed for the granola bar ( $\chi^2(9, N = 117) = 13.142, p = .011$ ). The majority of participants were willing to pay \$1.49 for the chips (54.7%), while 56.4% were willing to pay \$1.49 for the granola bar (Table 4.10). A greater frequency of participants viewing condition three, with the statements only, were willing to pay \$1.99 for the chips, suggesting condition three prompted a higher willingness to pay.

Table 4.10

*Crosstabs Analysis of Willingness to Pay for Clean Label Products (N = 117)*

Price	Condition 1	Condition 2	Condition 3	Condition 4	Total
<b>Chips</b>					
\$1.49	15	18	12	19	64
\$1.99	7	9	15	2	33
\$2.49	3	1	0	0	4
\$2.99	0	0	1	0	1
None at all	4	2	2	7	15
<b>Granola Bar</b>					
\$1.49	14	17	21	14	66
\$1.99	7	7	8	3	25
\$2.49	2	2	0	2	6
\$2.99	0	0	0	0	0
None at all	6	4	1	9	20

*Note:* Condition 1 = Clean Label without Statements, Condition 2 = Clean Label with Statements, Condition 3 = Statements Only, Condition 4 = Control

### **Perceptions and Attitudes Regarding Clean Labeling Practices**

RQ<sub>5</sub> sought to understand participants' perceptions and attitudes regarding the use of clean labels. Participants were asked to rank their agreement with six Likert-type items (1 = *strongly disagree* to 5 = *strongly agree*) about clean label practices. These statements were separated into two constructs—clean label practices and clean label risk perceptions. The questions about clean label practices asked whether clean label products

are safer, healthier, and more nutritious compared to traditional products. The grand mean for this construct was 3.30. Clean label risk perceptions questions asked participants to provide their perceptions of artificial ingredients and whether they present a risk for developing health issues, serious diseases, or food allergies. The grand mean for this construct was 3.51. A one-way ANOVA was calculated for each construct to compare the differences in responses between the four label conditions. The alpha level was set *a priori* at .05.

A one-way ANOVA showed no significant differences between clean label perceptions among the four label conditions ( $F = .851, p = .469$ ), meaning the label type had no effect on participants' perceptions of clean label practices (Table 4.11). Groups means for perceptions of clean label practices revealed equal perceptions for participants who viewed the clean label with statements ( $M = 3.40, SD = .708$ ) and those who viewed the packages with no label ( $M = 3.40, SD = .818$ ) (Table 4.12). Participants who viewed the statements only ( $M = 3.30, SD = .845$ ) and clean label without statements ( $M = 3.11, SD = .788$ ) had similar perceptions of clean label practices.

Table 4.11

*ANOVA of the Effects of Label Conditions on Perceptions of Clean Label Practices*

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	$F_{(3, 113)}$	<i>p</i>
Between Groups	1.598	3	.533	.851	.469
Within Groups	70.752	113	.626		

Table 4.12

*Group Means of Clean Label Practices Perceptions Between Label Conditions (N = 117)*

Label Condition	<i>M</i>	<i>SD</i>
1. Clean Label – No Statements	3.11	.788
2. Clean Label – Statements	3.40	.708
3. Statements Only	3.30	.845
4. No Label	3.40	.818

A one-way ANOVA showed no statistically significant differences between risk perceptions among the four different label conditions ( $F = 1.179, p = .321$ ), resulting in the label type having no effect on risk perceptions held by participants (Table 4.13). Group means were also calculated for the clean label risk perceptions (Table 4.14). Participants who viewed the clean label with no statements had the highest risk perception ( $M = 3.69, SD = .604$ ), while the clean label with statements ( $M = 3.52, SD = .746$ ), package with no label ( $M = 3.50, SD = .809$ ), and statements only ( $M = 3.33, SD = .743$ ) followed closely behind.

Table 4.13

*ANOVA of the Effects of Label Conditions on Clean Label Risk Perceptions*

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	$F_{(3, 113)}$	<i>p</i>
Between Groups	1.880	3	.627	1.179	.321
Within Groups	60.025	113	.531		

Table 4.14

*Group Means of Clean Label Risk Perceptions Between Label Conditions (N = 117)*

Label Condition	<i>M</i>	<i>SD</i>
1. Clean Label – No Statements	3.69	.604
2. Clean Label – Statements	3.52	.746
3. Statements Only	3.33	.743
4. No Label	3.50	.809

Participants were asked to provide their attitudes regarding the use of this clean label for current and future food packages. A one-way ANOVA was conducted to determine whether differences existed between the four groups for making this label mandatory for all clean products. The ANOVA showed no significant differences between the four label conditions and their attitudes toward making this label mandatory ( $F = 2.28, p = .083$ ), implying the label condition had no effect on the implementation of a mandatory label for clean products (Table 4.15). Group means were calculated for participants attitudes toward use of the four label conditions (Table 4.16). Those who viewed the clean label with statements reported the highest attitudes toward use of the clean label ( $M = 3.63, SD = 1.10$ ), while those who viewed the statements only ( $M = 3.33, SD = 0.96$ ) and clean label without statements ( $M = 3.21, SD = 1.15$ ) followed closely behind. Those who viewed the package without a label had the lowest attitudes toward use of the clean label ( $M = 2.89, SD = 1.67$ ).

Table 4.15

*ANOVA of the Effects of Label Conditions on Clean Labeling Use and Policies*

Source	SS	df	MS	$F_{(3, 113)}$	$p$
Between Groups	8.177	3	2.626	2.280	.083
Within Groups	135.071	113	1.195		

Table 4.16

*Group Means of Clean Labeling Use and Policies Between Label Conditions (N = 117)*

Label Condition	$M$	$SD$
1. Clean Label – No Statements	3.21	1.15
2. Clean Label – Statements	3.63	1.10
3. Statements Only	3.33	0.96
4. No Label	2.89	1.67

An additional ANOVA was conducted to determine whether differences existed between the four label conditions and the use of this label for products that do not naturally contain artificial ingredients. This one-way ANOVA revealed a significant difference between the four label conditions ( $F = 7.33, p < .001$ ), indicating the participants' attitudes toward using the label on products that do not naturally contain artificial ingredients was influenced by the label condition (Table 4.17). A Bonferroni comparison revealed significance between the package without a label and the "clean label without statements" ( $p = .033$ ), "clean label with statements" ( $p = .021$ ), and "statements only" ( $p < .001$ ). No statistically significant difference was found between

the three label conditions that contained a clean label or statements. Those who viewed the “clean label with statements” had the highest agreement toward using the clean label for products that do not naturally contain artificial ingredients ( $M = 4.00$ ,  $SD = .083$ ), while “clean label without statements” ( $M = 3.55$ ,  $SD = 1.18$ ) and “statements only” ( $M = 3.50$ ,  $SD = 1.11$ ) (Table 4.18).

Table 4.17

*ANOVA of the Effects of Label Conditions on Clean Label Use for Products Without Artificial Ingredients*

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	$F_{(3, 113)}$	<i>p</i>
Between Groups	24.605	3	8.202	7.333	< .001
Within Groups	126.387	113	1.118		

Table 4.18

*Group Means of Clean Label Use for Products That Do Not Naturally Contain Artificial Ingredients Between Label Conditions (N = 117)*

Label Condition	<i>M</i>	<i>SD</i>
1. Clean Label – No Statements	3.55	1.18
2. Clean Label – Statements	4.00	0.83
3. Statements Only	3.50	1.11
4. No Label	2.71	1.08

Finally, a one-way ANOVA was conducted to determine whether differences existed between the four label conditions and attitudes toward using the label only for products that might otherwise contain artificial ingredients. This ANOVA revealed no

significant differences between the four label conditions ( $F = .710, p = .548$ ), implying the label condition had no effect on the use of the clean label only for products that might otherwise contain artificial ingredients (Table 4.19). Participants who viewed the “clean label with statements” had the highest agreement toward the use of clean labels for products that do not naturally contain artificial ingredients ( $M = 3.00, SD = 1.17$ ). Those who viewed the “clean label without statements” ( $M = 2.72, SD = 1.16$ ), “no label” ( $M = 2.64, SD = 1.03$ ), and “statements only” ( $M = 2.63, SD = 1.06$ ) had similar agreement (Table 4.20).

Table 4.19

*ANOVA of the Effects of Label Conditions on Clean Label Use for Products That Might Otherwise Contain Artificial Ingredients*

Source	SS	df	MS	$F_{(3, 113)}$	P
Between Groups	2.624	3	.875	.710	.548
Within Groups	139.188	113	1.232		

Table 4.20

*Group Means of Clean Label Use for Products That Do Not Naturally Contain Artificial Ingredients Between Label Conditions (N = 117)*

Label Condition	M	SD
1. Clean Label – No Statements	2.72	1.16
2. Clean Label – Statements	3.00	1.17
3. Statements Only	2.63	1.06
4. No Label	2.64	1.03

### **Visual Attention Allocation**

The second part of this study sought to understand visual attention allocation toward clean labels and determine the relationship, if any, between visual attention and consumers' perceptions, attitudes towards, and willingness to purchase clean label food items. Through the eye-tracking experiment, visual attention allocation to the four clean label conditions was measured. Heat maps display the differences in visual attention allocation between the products and label conditions (Figures 4.1 and 4.2).



Figure 4.1. Heat map of visual attention allocation to the granola bar with each of the four label conditions

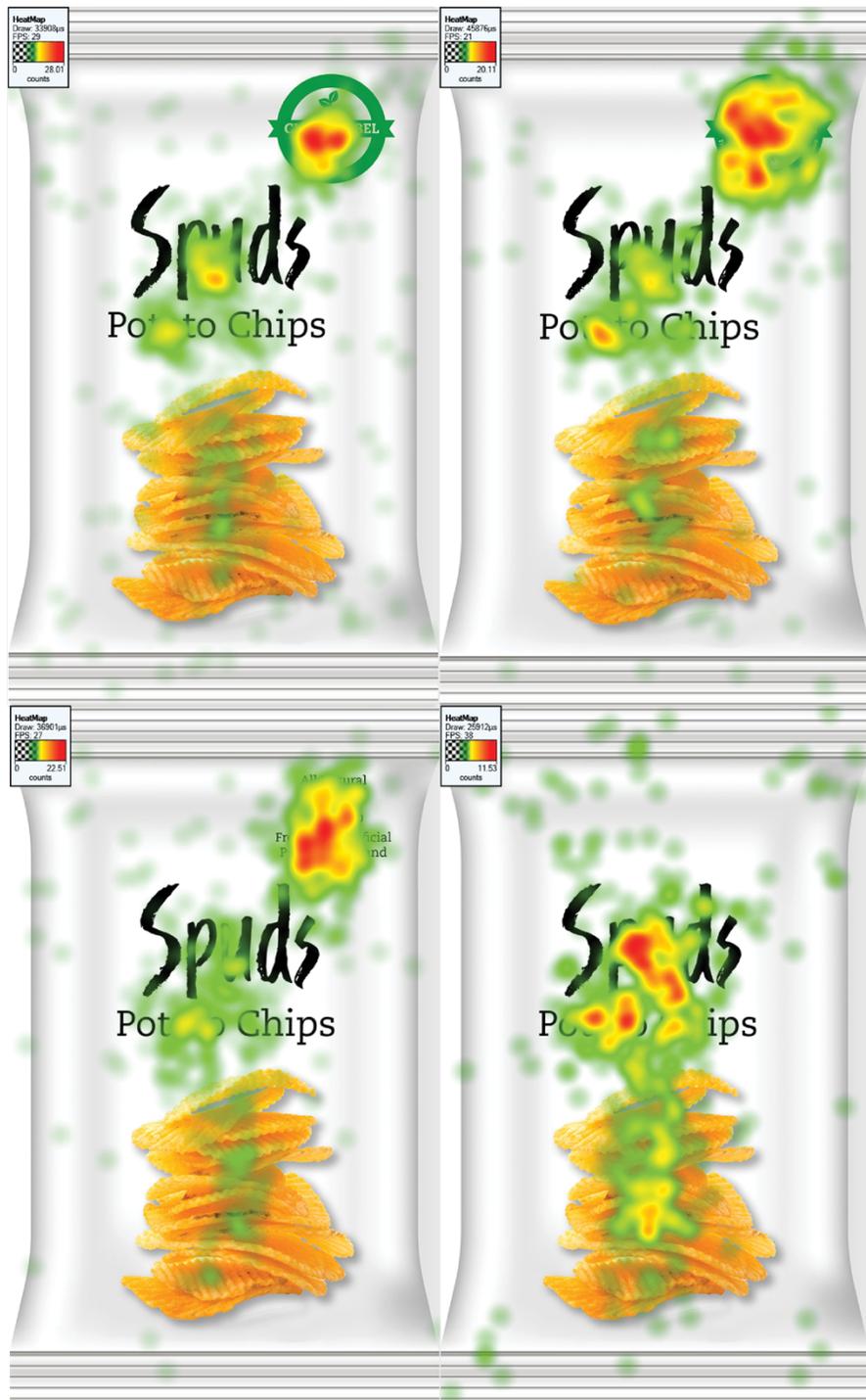


Figure 4.2. Heat map of visual attention allocation to the chips with each of the four label conditions

## Label Design

H<sub>1</sub> stated visual attention allocation would vary significantly based on label design. To capture visual attention to the clean label, areas of interest (AOIs) were set for each package in the upper righthand corner where the label was, or would have been, in the case of the package with no label. Fixation duration was measured by the total number of seconds a participant fixated on the AOI. The AOI for each package can be seen in Figures 4.3 and 4.4.



*Figure 4.3.* AOI placement on chips packaging



*Figure 4.4.* AOI placement on granola bar packaging

A one-way ANOVA was calculated to determine if any significant differences in visual attention allocation existed between the four label conditions. The alpha level was set *a priori* at .05. Group means were calculated for time spent on the label by participants in each condition.

The ANOVA showed a significant difference in visual attention between the four label conditions ( $F = 23.70, p < .001$ ), therefore  $H_1$  was accepted (Table 4.21). A Bonferroni comparison was conducted to determine if any significant differences existed between visual attention allocation to each label condition. The comparison showed significant difference between visual attention to the “clean label without statements” and “clean label with statements” ( $p = .001$ ). Additionally, significance was discovered between the package with no label and the other three conditions, “clean label without statements” ( $p = .001$ ), “clean label with statements” ( $p < .001$ ), and “statements only” ( $p < .001$ ).

Participants who viewed the clean label with statements spent the most time fixated on the label with an average of 3.22 ( $SD = 1.93$ ) seconds, while those who viewed the statements spent an average of 2.62 ( $SD = 1.43$ ) seconds, and participants who viewed the clean label with no statements spent an average of only 1.66 ( $SD = 1.82$ ) seconds (Table 4.22). Participants who viewed the package with no label spent an average of 0.06 ( $SD = 0.08$ ) seconds in the upper righthand corner of the package where the clean label would have been.

Table 4.21

*ANOVA of the Effects of Label Conditions on Visual Attention Allocation to Clean Labels*

Source	SS	df	MS	$F_{(3, 113)}$	$p$
Between Groups	163.651	3	54.550	23.689	<.001
Within Groups	260.211	113	2.303		

Table 4.22

*Group Means Total Fixation Duration Between Label Conditions (N = 117)*

Label Condition	$M$	$SD$
1. Clean Label – No Statements	1.66	1.82
2. Clean Label – Statements	3.22	1.93
3. Statements Only	2.62	1.43
4. No Label	0.06	0.08

*Note:* Fixation duration is reported in seconds

An independent samples  $t$ -test was conducted to compare visual attention allocation between those who knew what a clean label was compared to those who did not. The coded free-response results from RQ<sub>2</sub> were used to determine knowledge, with those who were able to describe one or more of the attributes being placed into the knowledgeable category ( $n = 20$ ), while all others were placed in an unknowledgeable category ( $n = 97$ ). The  $t$ -test showed no statistically significant differences in visual attention between participants who had knowledge of the clean label compared to those who did not ( $t_{115} = -1.798, p = .075$ ).

### Between Food Products

RQ<sub>6</sub> sought to understand differences in visual attention allocation between the two product types. Participants viewed the two product packages and total fixation duration was calculated for the label AOI on each package. Group means and standard deviations were calculated for total fixation duration to the label AOI on both product types (Table 4.23). Visual attention allocation was consistent among label condition for both the chips and granola bar.

Table 4.23

*Group Means of Visual Attention Allocation Between Product Type (N = 117)*

Label Condition	<u>Chips</u>		<u>Granola Bar</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. Clean Label – No Statements	1.68	1.72	1.64	2.21
2. Clean Label – Statements	3.30	2.39	3.14	1.97
3. Statements Only	2.86	1.69	2.37	1.49
4. No Label	0.01	.062	0.11	.166

*Note:* Fixation duration is reported in seconds

Participants who viewed the “clean label with statements” spent the most time fixated on the label, 3.30 (*SD* = 1.72) seconds for the chips and 3.14 (*SD* = 2.21) seconds for the granola bar. The “statements only” condition received the second-highest average fixation time with 3.86 (*SD* = 2.39) seconds for chips and 2.37 (*SD* = 1.97) seconds for the granola bar. Average fixation to the “clean label with no statements” was lower with 1.68 (*SD* = 1.69) seconds for chips and 1.64 (*SD* = 1.49) seconds for the granola bar. Participants who viewed the package with no label had the lowest average of time spent

fixated on the area with 0.01 ( $SD = .06$ ) seconds for chips and 0.11 ( $SD = .17$ ) seconds for the granola bar. A paired samples  $t$ -test showed no significant difference between visual attention allocation to the two product types ( $t_{116} = 1.103, p = .272$ ).

Two one-way ANCOVAs were conducted to determine if any differences in visual attention allocation existed between the visual and verbal elements for each product. The one-way ANCOVA for the chips revealed a statistically significant difference in visual attention allocation between the those who viewed the visual elements ( $F = 10.523, p = .002$ ) and the verbal elements ( $F = 46.988, p < .001$ ) (Table 4.24). The four covariates were not statistically significant in influencing visual attention to the clean label on the chips package.

Table 4.24

*Analysis of Covariance of Visual Attention to the Chips with Individual Difference Variables as the Covariates (N = 117)*

Item	<i>df</i>	<i>F</i>	<i>p</i>
Visual	1	10.523	.002*
Verbal	1	46.988	.000*
Age	1	.023	.880
Gender	1	.478	.491
Ingredient Concern	1	.849	.359
Pre-existing Packaging Attitudes	1	.080	.778

Note: \*Indicates significant at  $p \leq .05$

Figure 4.5 displays the interaction between the visual and verbal elements. This chart further emphasizes the effect of the verbal statements towards visual attention, as visual attention to the labels that included verbal statements was significantly higher

compared to the labels that did not contain these statements. Attention also increased when a visual element was added, with the label containing both the visual and verbal elements garnering the most visual attention for the chips.

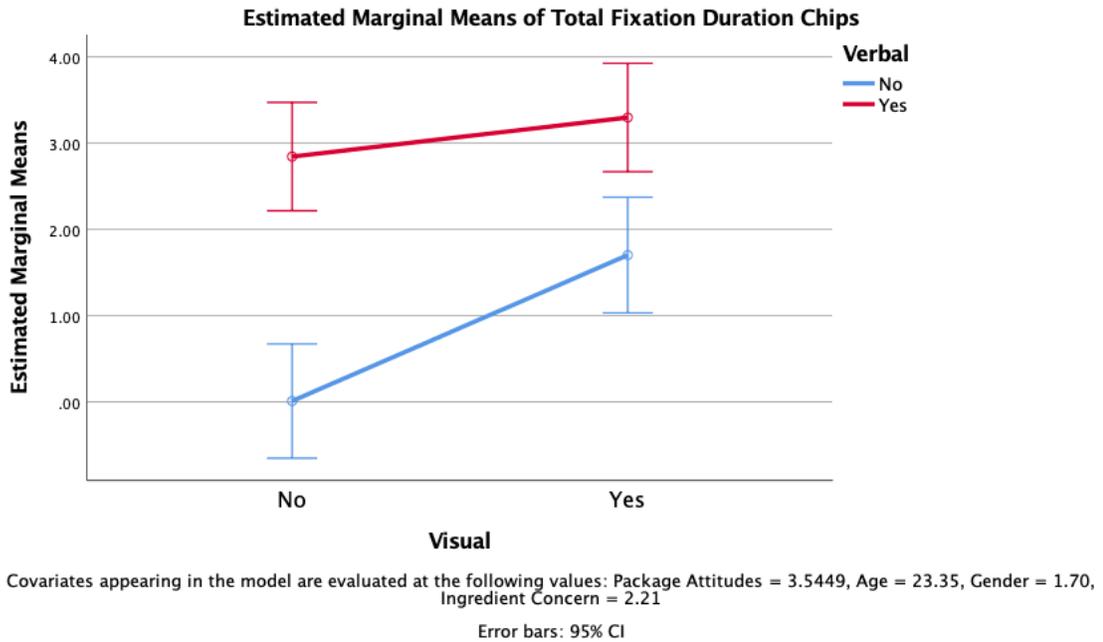


Figure 4.5. Means of fixation duration to the chips between visual and verbal elements

The one-way ANCOVA for the granola bar revealed similar results regarding visual attention to the visual and verbal elements of the packaging. A statistically significant difference between visual attention to the visual ( $F = 11.140, p = .001$ ) and verbal ( $F = 36.547, p < .001$ ) elements of the package (Table 4.25). The four covariates of age, gender, ingredient concern, and pre-existing packaging attitudes were not statistically significant toward visual attention.

Table 4.25

*Analysis of Covariance of Visual Attention to the Granola Bar with Individual Difference Variables as the Covariates (N = 117)*

Item	<i>df</i>	<i>F</i>	<i>p</i>
Visual	1	11.140	.001*
Verbal	1	36.547	.000*
Age	1	.437	.510
Gender	1	.343	.559
Ingredient Concern	1	.452	.503
Pre-existing Packaging Attitudes	1	.002	.964

Note: \*Indicates significant at  $p \leq .05$

Figure 4.6 displays the estimated marginal means from the granola bar. These results were similar to the chips, where visual attention to the verbal elements of the package was significantly higher overall. In addition, further support exists for combining the visual and verbal elements as it resulted in the most visual attention.

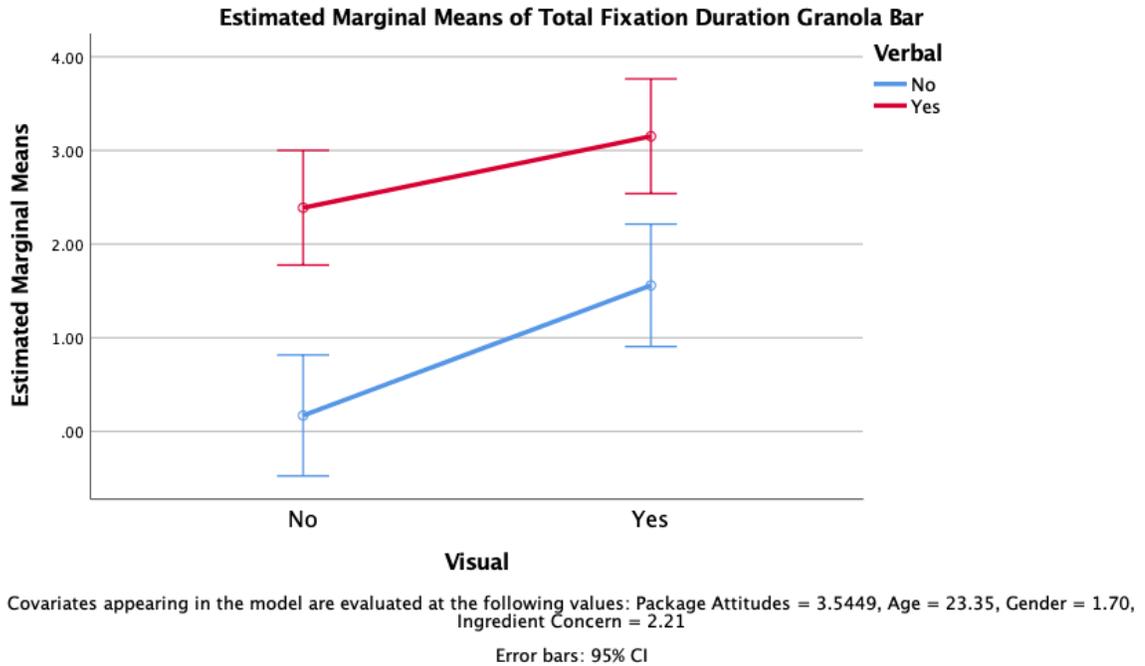


Figure 4.6. Means of fixation duration to the granola bar between visual and verbal elements

### Summary

This chapter provided an overview of the results for each research question and hypothesis. Descriptive statistics and a series of ANOVAs were used to analyze the data. In addition, a qualitative coding scheme was developed to analyze the free response question. The results showed significant effects of the four label conditions on attitudes towards clean label products, as well as perceptions of clean labels. The eye-tracking experiment revealed label design had a significant effect on visual attention allocation to the clean label.

## **CHAPTER V**

### **CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS**

#### **Overview**

As clean label products gain increased market share across grocery categories, this study established the need for a thorough understanding of how consumers perceive and interact with these products. Limited research has been conducted on consumer perceptions of the clean label, which is complicated by no standard and mutually agreed-upon definition existing for the claim. As food labels are an important heuristic for consumers to make quick purchase decisions at the grocery store, determining how consumers perceive and interact with the clean label provides insight into the current status and future of the trend.

This study was conducted using a 2 (visual: logo vs. statements) x 2 (verbal: yes vs. no) x 2 (product type: chips vs. granola bar) within- and between-subjects factorial design with a control. This study was divided into two parts: I) perceptions, attitudes, and willingness to purchase, and II) visual attention allocation. The conceptual framework of the Heuristic-Systematic Processing Model provided a foundation for the use of food labels as heuristic cues. A sample of Millennial and Generation Z undergraduate and graduate students at Texas Tech University comprised the sample, providing their perceptions, attitudes, and willingness to pay for clean label food products. The previous chapter reviewed the statistical findings of this study, while this chapter will provide conclusions and discussion for each of the key research areas. In addition, a discussion of recommendations for practice and future research will provide areas for food marketing

practitioners and food labeling researchers to continue shaping the conversation around clean label foods.

### **Conclusions and Discussion**

Food label claims have steadily increased as prominent features on packaging with consumers become more attentive to the ingredients in their foods, leading to a push for food distinctly identified with a clean label (Asioli, Aschemann-Witzel, et al., 2017). While the clean label has swiftly grown in popularity, little research has been conducted to understand consumer interactions with the label. Label claims have been found to be used heuristically by consumers, allowing purchase decisions to be made quickly and without much cognitive processing (Asioli, Aschemann-Witzel, et al., 2017; Silayoi & Speece, 2004; Verbeke, 2008). Thus, the researcher sought to understand how consumers perceive and use the label when making their food purchasing decisions.

#### **Part I: Perceptions, Attitudes, and Willingness to Pay**

As this study sought to understand consumers' perceptions and attitudes toward clean label food products, their pre-existing attitudes toward food labeling and food consumption provided an important foundation for further results. Participants indicated a desire to consume foods that were free from pesticides, chemicals, and toxins, as well as categorized as minimally processed, natural, and free from artificial ingredients. These characteristics comprise nearly all of the terms associated with clean label foods, as previous research has indicated (Asioli, Aschemann-Witzel, et al., 2017; The Nielsen Company, 2017). Although participants sought foods with those characteristics, they provided the lowest support for foods that were organic and non-GMO, suggesting these

attributes may not be as important for companies to focus on when developing clean label products. A majority of participants indicated they were either fairly concerned or very concerned with the ingredients in their foods, providing support for previous research that argued food label claims are rising along with a trend towards higher ingredient concern (Asioli, Aschemann-Witzel, et al., 2017; The Nielsen Company, 2017).

Participants provided strong support for several packaging elements as part of their purchase decision process. They indicated they look for packages that include a simple/short ingredient list, food origin, transparent packaging, as well as sustainability messages and food company branding. Each of these package elements had strong support from participants, suggesting companies should carefully consider how each is incorporated into a clean label package design. As the clean label manifests itself in front-of-package (FOP) label claims, these claims represent a crucial packaging element for consumers to attend to when making purchase decisions (Asioli, Aschemann-Witzel, et al., 2017). Label claims were found to be most influential when participants had time to read them while grocery shopping, indicating that label claims help promote food purchase decisions and that participants generally understand the meaning of claims. These findings provide support for the use of label claims as heuristics, as well as validate the use of label claims for marketing clean label products (Hoek et al., 2013).

Intrinsic and extrinsic factors have been found to contribute to consumers' quality perception process, which ultimately leads to purchase decisions (Jacoby et al., 1971; Olson & Jacoby, 1972). This study found taste, price, and quality to be the most

important factors participants considered as they are forming quality expectations. Other highly considered factors were health and convenience.

Although previous findings from this study found package elements to be highly influential, they fell near the bottom of the 10-item list, along with product recognition and brand recognition. While these items are not taken into consideration as much as other factors (e.g. price, nutrition label, etc.), participants did indicate their support for and use of packaging information when asked specifically about packaging elements. These findings provide an insight into Millennial and Generation Z participants' quality perception process, resulting in several factors that should be considered as prominent features of a marketing strategy for clean label foods.

Following exposure to the stimuli, participants were asked to provide any knowledge—pre-existing or gained by viewing the images—they had regarding clean labels. Half of the participants indicated they had never heard of clean labels, did not know what they meant, or associated clean labels with packaging was simplistic in design. Several participants were able to describe some or most of the attributes of a clean label, although there was little reference to the stimuli. Overall, most participants did not know what a clean label is, or they associated the term with other product characteristics. This finding suggests a lack of education surrounding clean labels by companies who incorporate such labels on their products. Currently, the term “clean label” is not widely recognized, leading many participants to have little idea of the definition even when they viewed the packages with clean labels included. As research toward creating a standard definition of clean label is on-going, the development of a

concise agreed-upon definition amongst companies with clean label products would allow consumers to gain a better understanding of the trend (Asioli, Aschemann-Witzel, et al., 2017).

Along with asking participants to list their thoughts regarding clean label food items, they were asked several questions to evaluate their attitudes toward the products. Findings showed a significant difference in attitudes toward clean labels between the four label conditions, indicating participant attitudes shifted depending on the label type they viewed. The descriptive analysis showed participants who viewed the label conditions 1-3, which included the clean label and/or statements, held fairly similar attitudes regarding the health, safety, and nutrition of clean label foods, while those who viewed the control had the lowest attitudes. To further understand where attitudes differed, a Bonferroni comparison was conducted. This comparison found a statistically significant difference between the “clean label without statements” and the “statements only” label conditions. These findings suggest the information included with the clean label influences consumers as they form attitudes about products with these labels. Descriptive statements included alongside the label provide context for the consumer to form heuristic cues about clean label foods, leading to a greater understanding of the trend and requiring less processing in order to make a purchase decision (Verbeke, 2008; Zuckerman & Chaiken, 1998). Providing both visual and verbal elements can also facilitate systematic processing of the label, as verbal elements provide a route for deeper cognitive processing of a label (Silayoi & Speece, 2004). Part II of this study also provided support for the label being processed systematically, which is elaborated on in the discussion of the eye-tracking

findings. Whether the consumer processed the descriptive statements heuristically or systematically, the statements increased attitudes surrounding clean label products, providing support for future label designs including this crucial element.

This study also sought to understand participants' perceptions of clean label products and determine whether label type and/or product type had any influence on perceptions. Participants who viewed the "statements only" had the highest mean perception for chips, while those who viewed the "clean label with statements" had the highest mean perceptions for the granola bar. As 45% of consumers have little understanding of the meaning of clean labels, including descriptive statements becomes imperative for furthering understanding of the trend (Gelski, 2016; Teisl & Levy, 1997). Both of these conditions included the statements, indicating the inclusion of explanatory statements resulted in more positive perceptions of the clean labels. The mean perception score for the granola bar was higher than the chips, signifying participants held more positive perceptions for the clean label when it was featured on the granola bar compared to when it was featured on the chips. This could be attributed to participants believing the granola bar is fundamentally healthier than the chips, due to pre-existing perceptions and overt marketing of granola bars as nutritious snacks. Ultimately, this could signal the clean label is more apt to be featured on products that previously maintain a "healthy" connotation.

Willingness to pay revealed a majority of participants were only willing to pay the lowest tier for both products. The chips had a higher percentage of participants willing to pay price tiers two through four, while the granola bar had a higher number of

participants who did not have an interest in purchasing the product. No consistent pattern was found that indicated one of the labels resulted in a willingness to pay a higher amount. Previous research indicated that Millennials were willing to pay higher prices for foods that included specific attributes (Hoffman, 2012; Mushkin et al., 2012), although that finding was not supported by this study as participants did not associate clean label products with higher priced goods.

As clean labels make their way onto various consumer food products, many companies are adapting and reformulating their products to meet the clean label criteria (Aschemann-Witzel et al., 2019). The marketing tactics used to promote clean labels must satiate a range of consumer preferences, as the formation of their quality perception ultimately leads to a purchase decision (Jacoby et al., 1971; Olson & Jacoby, 1972). This study sought to understand perceptions and attitudes associated with clean label practices, including labeling tactics and risk perceptions. No significant differences were found for clean label practices between the four label conditions. Even with this finding, the group mean for each label condition indicated participants had positive perceptions toward the use of the clean label in regard to the product being more nutritious, healthier, and safer when compared to conventional products.

No significant difference between risk perception was found, signifying the label type had no influence on participants' risk perceptions. Similar to perceptions of clean label practices, the group means for each label condition were above the scale's midpoint for risk perceptions. This indicated participants across label conditions agreed about the risk associated with several of attributes that lead to the development of clean label

designations. Essentially, participants agreed that artificial ingredients can pose health risks and may increase the likelihood of developing food allergies and/or serious diseases.

In order to further understand how consumers would like to see clean labels implemented on current and future packaging, participants were asked to provide their attitudes toward making the label mandatory. No significant difference was found between the four label conditions, indicating no label condition was particularly influential to participants' desire for a mandatory clean label. Participants who viewed the clean label with statements had the highest group mean, while the lowest belonged to those in the control. This aligns with previous findings in this study and Lahteenmaki (2013), where including descriptive statements alongside the designed label provides context for consumers to make the connection between the information contained on the label and their needs. Consumers have limited cognitive ability to process information, which makes food labels with context crucial for helping consumers sort out their assessment of the label (Verbeke, 2008; Zuckerman & Chaiken, 1998).

To measure attitudes regarding the use of the clean label for products that do not naturally contain artificial ingredients, participants in each of the label conditions were asked to indicate their agreement with several questions. A statistically significant difference in attitude was found between the four label conditions, indicating the label type influenced participants' attitudes regarding the use of the clean label for products that do not naturally contain artificial ingredients. The Bonferroni comparison showed significance existed between the control and the other three label conditions. These

findings show the three conditions with a label or statements were more likely to contribute to participants' positive attitudes toward the use of the clean label for products that do not normally contain artificial ingredients. Similarly, participants were asked to indicate their attitudes toward the use of the clean label only for products that might otherwise contain artificial ingredients. No significant differences were found between the four label conditions in this analysis. Group means for each label condition were fairly low, with those viewing the "clean label with statements" having the highest mean agreement. Altogether, these findings indicate participants only had some opinion toward the use of the clean label for products that might contain artificial ingredients. Comparing the previous finding with these findings, these results show participants who viewed one of the labels or statements only were not influenced toward limiting the use of clean labels for products that do contain artificial ingredients; whereas, they supported the use of the label for products that do not contain artificial ingredients.

These findings provided intriguing insight into Millennial and Generation Z interactions with clean label foods. Previous research indicated that both generations were becoming increasingly concerned with the ingredients in their foods, as Millennials sought foods that were natural, organic, locally sourced, and sustainable (Rosenbloom, 2018), while Generation Z consumers aligned their image of health with clean eating (The NPD Group, 2018). This study found a diverse amount of ingredient concern among consumers in these generations, as well as a lack of awareness surrounding clean label products, as only 20 participants were able to name one or more attributes of a clean label. These findings suggest this group of Millennial and Generation Z consumers are

not as attuned to the desire to seek clean foods based on ingredients, which could be influenced by the geographic location where the study was conducted. There would likely be a greater awareness and knowledge of clean label products if the study was conducted in an area where health and nutrition concerns are a prominent factor in daily food choice deliberations.

## **Part II: Visual Attention Allocation**

Using visual attention allocation as a variable allowed the researchers to explore the amount of time participants were spending in areas of interest (AOIs), which serves as a proxy for measuring cognitive processing. Wedel and Pieters (2008) found an individual's visual attention indicates areas where the individual perceives a need for further processing. To understand visual attention to the label, AOIs were created which encompassed the label itself and a small area around the edges. Visual attention varied significantly between the four label conditions, with those who viewed the "clean label with statements" spending the most time attending to the label, followed by the "statements only" and the "clean label without statements." Visual attention to the label area on the control was negligible for both products, which is understandable as there was nothing to attract or hold attention in that area.

These findings show participants spent time considering the information included with each label, as more time was spent reading the two conditions that included the statements. Understanding the information included and format of a message that draws the most visual attention can support creation of further messages that utilize the same tactics (Van Loo et al., 2018). These findings also reveal an interesting look at the

processing route associated with visual and verbal elements of the label. As more visual attention was directed toward the labels that included descriptive statements, it is clear participants were reading the text, which corresponds with further processing of the information. The descriptive statements provided an avenue for participants to process the information systematically, in addition to heuristically, as previously expected (Silayoi & Speece, 2004).

To understand whether the product type (granola bar or chips) had an influence on visual attention, group means between the two products were compared. This analysis showed no statistically significant difference in visual attention between the chips and granola bar among all four label conditions. The “clean label with statements” was consistent in having the highest visual attention mean between the two products, followed by the “statements only” and “clean label without statements.” Again, visual attention to the control was negligible between both the chips and the granola bar. This finding corresponds with the previous finding of descriptive information having an effect on the visual attention to the label, as the “clean label with statements” and “statements only” had the highest mean visual attention between the two products.

An additional analysis between the visual and verbal elements of the label revealed a statistically significant difference in visual attention allocation to both products. Although the four covariates of age, gender, ingredient concern, and pre-existing packaging attitudes had no influence on visual attention, participants’ fixations were significantly different depending on the visual and verbal composition of the label. Results for both the chips and the granola bar showed that visual attention was higher for

the verbal element, and combining visual and verbal elements elicited the highest amount of visual attention. While these findings indicate the product type had no effect on visual attention, they continue to support the finding that including descriptive information on the label influences visual attention. Consumers without a predefined product preference tend to rely on textual information, even as visuals allow quick decisions to be made (Townsend & Kahn, 2014). By including descriptive statements with the label, consumers are able to make an initial judgement if the label is featured on a product they have never seen before. For familiar labels, consumers can use the entire label and their retained knowledge as heuristics to make quick decisions without an abundance of cognitive effort.

### **Complete Study**

Overall, this study demonstrates the lack of consumer understanding surrounding the clean label trend. The majority of participants did not have much knowledge of clean labels, even as the trend is being driven by members of their generation. Including descriptive statements with the label allowed participants to gain a better understanding of the meaning and increased their perceptions and attitudes of the clean label products. These labels also elicited the highest amount of visual attention. While including the descriptive statements strengthened participants' views in some aspects, it had no effect on perceptions toward labeling tactics and risk perceptions. This finding suggests all participants felt clean labels are accurately describing the attributes associated with clean label products, without contributing to the mass of misinformation surrounding food labeling as Nielsen (2017) and Schmitz-Hubsch (2018) previously found. Participants

who viewed the two label conditions that included statements were also most likely to agree with the label being mandatory, in addition to supporting the use of the label for products that do not naturally contain artificial ingredients. These participants did not believe the label should be limited to products that might contain artificial ingredients, providing a path for the clean label to be used across product categories.

Visual attention allocation, as captured through eye-tracking, provided a supplementary explanation of how each participant attended to the label. As the “clean label with statements” and “statements only”—which included the verbal elements—prompted the highest visual attention duration, it is clear these labels attracted more scrutiny from the viewer. Although participants had varying perceptions of the chips and granola bar, no statistically significant difference to visual attention existed between the two products. Therefore, it can be concluded that product type had no influence on visual attention to the clean label.

As evidenced by the results from part II of this study, providing both visual and verbal elements—in the form of descriptive statements—allowed participants to process the label both heuristically and systematically. Higher visual attention was allocated toward the labels that included descriptive statements, indicating that these statements were being processed systematically, as participants were engaging in deeper cognitive processing by spending increased time reading the included statements. This finding provides a contribution to literature on processing modes associated with food label claims. Label claims are inherently used as heuristic cues, although including descriptive statements within a label claim provides an avenue for systematic processing. Appealing

to both processing modes yields alternate paths toward a purchase decision for consumers, as they are able to process the information through multiple routes. The increased visual attention and further need for processing that was required for understanding these labels allowed for increased attitudes and perceptions toward these labels, which adds to the on-going support for the use of descriptive statements in the creation of food label claims.

### **Implications**

This study sought to understand perceptions, attitudes, willingness to pay, and visual attention allocation toward clean label products. Although no direct connection was made between visual attention allocation and the participants' perceptions and attitudes, the findings do suggest a link between the two. Increased visual attention was recorded by those who viewed the "clean label with statements" and the "statements only," with these participants also contributing higher perceptions and attitudes compared to the remaining labels. These findings imply increased visual attention could influence participants' perceptions and attitudes toward the products, as they are spending more time absorbing the information included.

### **Recommendations**

#### **Recommendations for Practice**

As this study sought to understand how consumers interact with clean labels, it provides several areas where food production companies can strengthen their marketing of clean label products. It is clear that consumers prefer a label that includes descriptive statements, which also led to more positive perceptions. Including these statements on the

label will also add to creating a standard definition because the meaning of the claim would then be immediately associated with the term “clean label.” This study showed participants were more interested in purchasing foods that were free from artificial ingredients and natural, indicating practitioners should focus on these attributes as they develop clean labels. Overall, participants in this study did not seek out organic and non-GMO product; therefore, these claims could likely be treated as separate product attributes instead of being included within the definition of the clean label.

As clean label products are developed, attention should be directed toward creating a package that includes a simple ingredient list, food origin, and transparent packaging. Integrating the clean label within the product branding while allowing it to stand out provides consumers with the necessary information without overwhelming them. Even so, many participants across the four label conditions could not immediately recall the meaning of the clean label. This provides an opportunity for practitioners to implement label designs that incorporate both a reference to the product being clean and the company’s standards for clean products. Including these descriptive statements would also guide consumers away from associating the clean label with packaging features, such as a package with few words being identified as “clean.”

Ultimately, a mutually agreed-upon and regulated definition would provide the most stability for the future of the clean label trend. Without a standard definition, companies may group attributes together that may not necessarily fit the understood meaning of a clean label. Companies who produce clean label foods should push for a government definition of the claim, with the intention of keeping the trend from steering

in alternate directions. A standard definition would allow consumers to be more confident in their clean label purchases as they would be able to ensure the attributes of the product align with their consumption preferences. It would also prevent certain companies from pandering to consumers who are concerned with pesticides, chemicals, and other toxins in their foods. While it may seem like a substantial goal to create a regulated definition for clean label foods, it would provide a much needed constant for consumers who face an onslaught of FOP label claims that must be deciphered when making purchase decisions. As regulation of FOP labels is a goal of the FDA in the near future (Hamburg, 2010), the creation of a definition for clean labels closely aligns with their plans.

### **Recommendations for Research**

This study provided several pathways for future research. While this study focused on perceptions and attitudes toward the clean label within the Millennial and Generation Z age range, incorporating a nationally representative sample would provide a look at how the clean label trend is accepted across generations. Although younger generations are driving the trend, it does not rule out the desire for older generations to consume clean label foods. A nationally representative sample would recognize opinions beyond the scope of the sample obtained for this study.

A key theme woven throughout this study is the need for regulation of FOP label claims, including the clean label. As indicated by previous research, consumers are more likely to trust labels that government agencies support (Golan et al., 2001). Conducting a similar study with an emphasis on the label being regulated may provide a better insight into consumer trust of the label. Similarly, if the FDA or USDA do begin to regulate the

clean label, this study should be conducted again to assess how opinions change when government regulatory oversight is involved.

When determining willingness to pay, this study was limited by the use of an ordinal measure. A more robust measure should be used in future studies to gain a better understanding of participants' willingness to pay higher prices for clean label foods. Willingness to pay scales that are more economic in nature would provide a more accurate look at the exact price and demand associated with the clean label trend.

Further research into participants' heuristic and systematic processing modes would result in a better understanding of how label claims are used toward purchase decision. Most previous research points toward the use of labels as a heuristics, although few studies have discussed the processing mode associated with initial opinion formation of a label. This study provided support for the label being processed systematically when descriptive statements were included within the label design. It is clear that dual processing modes play a role in how consumers interpret and process clean label claims. Further exploring the use of dual processing modes in regard to evaluating food labels would allow for a better understanding of the consumers' entire cognitive process toward selecting a food for consumption, including the use of each intrinsic and extrinsic factor as well as the effects of differences in design.

Eye-tracking provides an additional layer to understanding how consumers attend to food labels. The results of this study show label format significantly affects attention to the label, aligning with previous findings from Fenko et al. (2018). Even as label format makes a difference, this study did not tell us what about the label would make the product

stand out when crowded amongst others on the grocery store shelves. Conducting the eye-tracking portion of this study in a field-based setting—particularly a grocery store with many product options in the field of vision—would provide a better idea of how the clean label draws consumers’ attention when situated amongst other products with similar claims. A field-based setting would also improve ecological validity, as a constraint of the lab setting is participants are acutely aware that they are participating in a research study.

In addition to conducting a field-based study, measuring participants’ level of attention toward other elements of the package would allow some insight into how much visual attention the clean label captures compared to elements such as brand name or a product image. Although participants ranked package information and brand recognition at the bottom of factors considered when making food purchase decisions, they still constitute two crucial elements for gaining the consumers’ attention, allowing the consumer to assess such elements as quality cues or the nutrition panel. One of the ultimate objectives of product marketing is drawing the consumer in through appealing design with the goal of influencing a purchase. Measuring visual attention to the entire product allows the development of cohesive design, which can aid in the sale of an item and promote future growth of clean label products.

### **Summary**

This study provided insight into consumer perceptions, attitudes toward, and willingness to purchase clean label foods. The findings of this study added to the on-going research regarding how to craft a definition for clean labels. In addition, label

format and statements were found to influence participants' interactions with the label, including visual attention allocation. The results of this study provide a path toward the formation of a definition for clean labels, as well as insight into the format and appearance of label claims. Practitioners can use this research to understand how consumers perceive clean label claims and apply the findings toward creation of distinctive clean labels that influence consumers to purchase their products. Future research on clean labels, including eye-tracking measures, has the potential to build on the findings of this study through further scrutinizing consumer perceptions and attitudes of the label across demographics and methodologies.

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APPENDIX A

IRB APPROVAL



May 6, 2019 11:25 AM CDT

Courtney Meyers  
Ag Education and Communication

Re: IRB2019-258 Clean Label Eye Tracking Study

**Findings:** *Good luck with your research.*

Dear Dr. Courtney Meyers, Caitlin Stanton:

The Human Research Protection Program determined that your project meets at least one of the federal exempt categories under 45 CFR 46 Category 3.(i)(A). Research involving benign behavioral interventions in conjunction with the collection of information from an adult subject through verbal or written responses (including data entry) or audiovisual recording if the subject prospectively agrees to the intervention and information collection. The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

The determination was made on May 6, 2019. Annual review is not required, and no expiration date will be listed on your letter.

The research must follow Texas Tech University's Operating Procedures, the Belmont Report, and 45 CFR 46. If changes to the approved protocol occur, a **Modification Submission** must be reviewed and approved by the IRB before implementation. Please contact the Human Research Protection Program to determine if a modification is needed or submit a Modification Submission in Cayuse IRB. Please be aware that changes to the research protocol may prevent the research from qualifying for exempt review and require submission of a new IRB application or other materials to the Texas Tech University IRB.

A goal of the IRB is to prevent negative occurrences during any research study.

However, despite our best intent, unforeseen circumstances or events may arise during the research. If a deviation, unanticipated problem or adverse event happens during your research, please notify the Texas Tech University, Human Research Protection Program as soon as possible (45 CFR 46). We will ask for a complete explanation of the event and for you to submit an **Incident Submission** in Cayuse IRB.

Your study may be selected for a Post-Approval Monitoring (PAM). You will be notified if your study has been chosen for a PAM. A PAM investigator may request to observe your data collection procedures, including the consent process.

Once your research is complete, please use a **Closure Submission** to archive this study. IRBs that remain active are subject to audit by the IRB.

Sincerely,

ORIGINAL SIGNATURE AVAILABLE UPON REQUEST
--

Scott Burris, Ph.D.  
Chair Texas Tech University Institutional Review Board  
Professor, Department of Agricultural Education and Communications  
Human Research Protection Program  
357 Administration Building  
Lubbock, Texas 79409-1075  
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## **APPENDIX B**

### **RECRUITMENT MATERIALS**

Participants were recruited through the Texas Tech University announcement service, TechAnnounce, using the script below.

#### **TechAnnounce Script**

Researchers are seeking undergraduate and graduate student participants for study on perceptions of food labeling. Participants will come to the Department of Agricultural Education and Communications and spend 30 minutes viewing images and completing a survey. Each participant will be paid \$20. If interested, please contact Caitlin Stanton at [caitlin.stanton@ttu.edu](mailto:caitlin.stanton@ttu.edu)

This study has been approved by the Human Research Protection Program at Texas Tech University.

#### **Initial Email Reply**

Hello,

Thank you for your interest. Please fill out the linked Google Form and I will get back to you as soon as possible.

[https://docs.google.com/forms/d/e/1FAIpQLSdYinLTilcr4-Jt1Ui8jVeUFsSj-Yn3SNHHSbpCfTR8opw9CQ/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLSdYinLTilcr4-Jt1Ui8jVeUFsSj-Yn3SNHHSbpCfTR8opw9CQ/viewform?usp=sf_link)

**Scheduled Time Email**

Hello,

Thank you for your interest in the food labeling study. Your scheduled time is Thursday, June 20 at 11:30 AM in AGED 206A. If the door is closed, please wait outside until you are called inside the room. Please bring your R# so that you may receive your compensation.

If you have any questions or cannot make it at this scheduled time, please let me know.

**Study Reminder Email**

Hello,

This is a reminder that you are scheduled to participate in the Food Labeling Study tomorrow, Thursday, June 20 at 11:30 AM in AGED 206A. If you are no longer able to make this time and would like to reschedule, please let me know.

## APPENDIX C

### SURVEY INSTRUMENT

Participants were randomly assigned to view one of the label conditions and provided answers to the questionnaire which matched their assigned label condition. The only difference between the surveys was the image label condition viewed by the participant. Only one version of each survey is included, however the alternate images seen by the participants are included in Appendix D.

#### **Clean Label Pre-Survey**

##### **Start of Block: Information about this Study**

Q1

##### **What is the project studying?**

This study is called “An Analysis of Consumer Knowledge, Perceptions, Visual Attention Allocation, and Motivations to Purchase Clean Label Food Items.” The research findings will be used to inform future research about education and communication techniques in the field of agricultural communications.

##### **What would I do if I participate?**

First, you will be asked to complete a short survey containing questions about you and your grocery shopping habits. Then, you will complete a short calibration of the Tobii Pro eye tracking software before viewing product packages. Finally, you will complete another short survey containing questions regarding your perception of the packages. This will conclude the session.

##### **Can I quit if I become uncomfortable?**

Yes, absolutely. Your participation is completely voluntary. You may skip a question or task you do not feel comfortable completing. You are free to discontinue participation at any point you wish. Participation is your choice. Your thoughts and opinions are valued.

##### **How long will participation take?**

Participation will take about 30 minutes of your time.

##### **How are you protecting privacy?**

All data collected will be kept on a secure, password protected computer in the researchers’ offices. Any responses you provide will not be linked to your identity.

**How will I benefit from participating?**

You will be providing invaluable knowledge to the agricultural industry. You will also be receiving compensation.

**I have some questions about the study. Who can I ask?**

The principal investigator of the study is Dr. Courtney Meyers. If you have questions, you can direct them to Caitlin Stanton via phone (806.834.8472) or email (caitlin.stanton@ttu.edu) or Dr. Courtney Meyers via phone (806.834.4364) or email (courtney.meyers@ttu.edu). Additionally, Texas Tech University has a board that protects the rights of people who participate in research. You can call to ask them questions at 806.742.2064. You can email questions to the Human Research Protection Program, office of the Vice President for Research, Texas Tech University, Lubbock, Texas 79409 or email questions to hrpp@ttu.edu.

**End of Block: Information about this Study**

**Start of Block: Pre-Survey**

Q2 Please indicate your gender.

Male (1)

Female (2)

Q3 What is your age in years?

---

Q4 What is your academic classification?

Freshman (1)

Sophomore (2)

- Junior (3)
- Senior (4)
- Graduate Student (5)

Q5 What is your major?

---

Q6 How would you describe your political views?

- Very conservative (1)
- Somewhat conservative (2)
- Moderate (3)
- Somewhat liberal (4)
- Very liberal (5)
- Prefer not to answer (6)

Q7 Do you identify with a political party? If so, which one?

- Republican (1)

Democrat (2)

Independent (3)

Prefer not to answer (4)

Q8 Are you the primary grocery shopper for your household?

Yes (1)

No (2)

Prefer not to answer (3)

Q9 How often do you go grocery shopping?

Daily (1)

Twice a week (2)

Once a week (3)

Every other week (4)

Once a month (5)

Q10 What specific diet do you follow?

Omnivore (1)

Vegetarian (2)

Vegan (3)

Gluten-Free (4)

Other (5)

Page Break

Q11 Thinking about a typical week, where do you purchase most of your food?

- Grocery Store (1)
- Casual/Sit-down Restaurant (2)
- Fast Food (3)
- Dining Hall (4)
- Other (5)

Q12 In general, how concerned are you about the ingredients in your food?

- Very concerned (1)
- Fairly concerned (2)
- Not very concerned (3)
- Not concerned at all (4)
- Don't know (5)

Q13 I consider the following factors when purchasing food products:

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Quality (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taste (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Price (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Package Information (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brand Recognition (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product Recognition (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Convenience (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Nutrition Label (9)



Recommendations  
from friends and  
family (10)



Page Break

Q14 I believe the food I consume should be:

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Organic (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Non-GMO (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Free from artificial ingredients (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Natural (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Minimally processed (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Free from pesticides, chemicals, and toxins (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q15 I believe the packaging of the food I consume should include:

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
A simple/short ingredient list (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food company branding (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transparent packaging (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sustainability messages (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food origin (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q16 Below is a list of statements regarding food packages. Please indicate your level of agreement with each statement.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
The health claims and nutrition information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

on the front of food packages help me decide what to purchase. (1)

The health claims and nutrition information on the front of food packages help me make purchase decisions when I'm in a hurry. (2)

I pay more attention to health and nutrition claims on the front of food packages when I have time to read them while grocery shopping. (3)

I understand the meanings of health claims found on food packages. (4)

<input type="radio"/>				
<input type="radio"/>				
<input type="radio"/>				

**End of Block: Pre-Survey**

**Clean Label Post-Survey 1**

**Start of Block: Post-Treatment Survey**

Q1 To the best of your ability, please tell us everything you know about clean labels.

---

Page Break

**End of Block: Post-Treatment Survey**

**Start of Block: Product Image 1**

Q64 Now that you've viewed the product images, please answer the following questions regarding the package and it's label.

Q2



Q3 Please indicate your level of agreement or disagreement with the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
The ingredients in this product are safe. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are healthy. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are nutritious.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(3)

The ingredients in this product are unhealthy. (4)

The ingredients in this product are clean. (5)

Q4 Thinking about the label shown on the package, please indicate how much you agree or disagree with the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
The label made me concerned about the ingredients in my food. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is informative. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The label is misleading. (3)

The label is well designed. (4)

The label is credible. (5)

Q5 What is the most you would be willing to pay for a 9 oz. package of this product?

\$5.49 (1)

\$5.99 (2)

\$6.49 (3)

\$6.99 (4)

None at all (5)

Page Break

**End of Block: Product Image 1**

**Start of Block: Product Image 4**

Q65 Now that you've viewed the product images, please answer the following questions regarding the package and it's label.

Q14



Q15 Please indicate your level of agreement or disagreement with the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
The ingredients in this product are safe. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are healthy. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are nutritious. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are unhealthy. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are clean. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q16 Thinking about the label shown on the package, please indicate how much you agree or disagree with the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
The label made me concerned about the ingredients in my food. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is informative. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is misleading. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is well designed. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is credible. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q17 What is the most you would be willing to pay for a 2 oz. package of this product?

- \$1.49 (1)
- \$1.99 (2)
- \$2.49 (3)
- \$2.99 (4)
- None at all (5)

**End of Block: Product Image 4**

**Start of Block: Product Image 2**

Q66 Now that you've viewed the product images, please answer the following questions regarding the package and it's label.

Q6



Q7 Please indicate your level of agreement or disagreement with the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
The ingredients in this product are safe. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are healthy. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are nutritious. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are unhealthy. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are clean. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q8 Thinking about the label shown on the package, please indicate how much you agree or disagree with the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
The label made me concerned about the ingredients in my food. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is informative. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is misleading. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is well designed. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is credible. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 What is the most you would be willing to pay for a 20 oz. package of this product?

- \$1.49 (1)
- \$1.99 (2)
- \$2.49 (3)
- \$2.99 (4)
- None at all (5)

**End of Block: Product Image 2**

**Start of Block: Product Image 8**

Q67 Now that you've viewed the product images, please answer the following questions regarding the package and it's label.

Q30



Q31 Please indicate your level of agreement or disagreement with the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
The ingredients in this product are safe. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are healthy. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are nutritious.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(3)

The ingredients in this product are unhealthy. (4)

The ingredients in this product are clean. (5)

Q32 Thinking about the label shown on the package, please indicate how much you agree or disagree with the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
The label made me concerned about the ingredients in my food. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is informative. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is misleading. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is well designed. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The label is  
credible. (5)

Q33 What is the most you would be willing to pay for one 2 oz. package of this product?

- \$1.49 (1)
- \$1.99 (2)
- \$2.49 (3)
- \$2.99 (4)
- None at all (5)

Page Break

End of Block: Product Image 8

Start of Block: Product Image 3

Q68 Now that you've viewed the product images, please answer the following questions regarding the package and it's label.

Q10



Q11 Please indicate your level of agreement or disagreement with the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
The ingredients in this product are safe. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are healthy. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are nutritious. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are unhealthy. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ingredients in this product are clean. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q12 Thinking about the label shown on the package, please indicate how much you agree or disagree with the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
The label made me concerned about the ingredients in my food. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is informative. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is misleading. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is well designed. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The label is credible. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q13 What is the most you would be willing to pay for a 16 oz. package of this product?

- \$4.49 (1)
- \$4.99 (2)
- \$5.49 (3)
- \$5.99 (4)
- None at all (5)

**End of Block: Product Image 3**

**Start of Block: Knowledge Questions**

Q46 Thinking about your grocery shopping experiences, how often do you consult front-of-package labels when shopping for food?

- Hardly ever (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Most of the time (5)

Q47 Please indicate your level of agreement or disagreement with the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Clean label food products are healthy. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clean label food products are nutritious. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Clean label food products are unsafe. (3)

Q48 Thinking about your opinions of clean label products, please indicate your level of agreement or disagreement with each of the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Clean label products are more nutritious. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clean label products make me feel healthier. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clean label products are safer. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food products with artificial ingredients can present health risks. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eating products with artificial ingredients can increase the likelihood	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

of developing  
food allergies.  
(5)

Eating  
products with  
artificial  
ingredients  
can increase  
the likelihood  
of developing  
serious  
diseases. (6)



Page Break

Q69



Q49 Please indicate how much you agree or disagree with the following statements in regards to the images above.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
This label should be mandatory for all "clean" products. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I support the use of this label for products that do not naturally contain artificial ingredients. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This label should only be used for products that might otherwise contain artificial ingredients. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**End of Block: Knowledge Questions**

**APPENDIX D**  
**LABEL CONDITIONS**



*Figure D.1.* Chips Condition 1: Clean Label without Statements



Figure D.2. Chips Condition 2: Clean Label with Statements



*Figure D.3.* Chips Condition 3: Statements Only



*Figure D.4.* Chips Condition 4: Control



Figure D.5. Granola Bar Condition 1: Clean Label without Statements



Figure D.6. Granola Bar Condition 2: Clean Label with Statements



Figure D.7. Granola Bar Condition 3: Statements Only



*Figure D.8.* Granola Bar Condition 4: Control