Effects of *Au Naturel* Packaging Colors on Willingness to Pay for Healthy Food

Veronica Marozzo
Researcher Fellow, University of Messina,
Department of Economics
Building D, 98122 Messina (ME), Italy
Phone: +39 090 6768022; e-mail: veronica.marozzo@unime.it

Maria Antonietta Raimondo
Associate Professor, University of Calabria, Campus of Arcavacata,
Department of Business Administration and Law
Cubo 3C, 87036 Rende (CS), Italy
Phone: +39 0984 492248; e-mail: ma.raimondo@unical.it

Gaetano "Nino" Miceli
Assistant Professor, University of Calabria, Campus of Arcavacata,
Department of Business Administration and Law
Cubo 3C, 87036 Rende (CS), Italy
Phone: +39 0984 492162; e-mail: g.miceli@unical.it

Irene Scopelliti
Reader in Marketing, Cass Business School, City, University of London
106 Bunhill Row, EC1Y 8TZ London (UK)
Phone: +44 (0) 20 7040 5209; email: irene.scopelliti@city.ac.uk

Abstract

This research introduces and defines a novel color family – *au naturel* colors – and proposes that featuring these hues on product packaging enhances consumer willingness to pay for healthy food products, but not for unhealthy food products. This effect occurs irrespective of the fit between the colors of the product and of the packaging, and of the color lightness or saturation. Perceptions of product authenticity mediate the relationship between *au naturel* colors packaging and consumer willingness to pay for the product. The results of seven studies provide support for the proposed conceptual framework, contributing to the literature on consumer responses to colors and packaging features, and allowing to draw implications for the marketing of healthy food products.

Color is highly relevant in many areas of marketing (e.g., advertising, store atmospherics, logo design, and packaging). Not surprisingly, a vast body of research has examined its influence on consumer perceptions (e.g., Chebat & Morrin, 2007; Huang & Lu, 2015), emotions (e.g., Clarke & Costall, 2008), attitudes (e.g., Meyers-Levy & Peracchio, 1995; Gorn, Chattopadhyay, Yi, & Dahl, 1997), and dispositions towards the product (e.g., Kaltcheva & Weitz, 2006; Bagchi & Cheema, 2013). Mirroring general research on colors, several studies have investigated the effects of packaging color on consumer perceptual, emotional, attitudinal, dispositional, and behavorial responses (e.g., Huang & Lu, 2015; Roullet & Droulers, 2005). This stream of research provides evidence that packaging color has not only aesthetic value (Bloch, Brunel, & Arnold, 2003), but it also conveys product information that influences consumer behavior (Garber, Burke, & Jones, 2000; Mai, Symmank, & Seeberg-Elverfeldt, 2016).

Understanding which meanings consumers associate to packaging colors represents a crucial issue for firms to correctly communicate their desired brand positioning. Previous studies have provided evidence that, for instance, red attracts attention (e.g., Puccinelli, Chandrasekaran, Grewal, & Suri, 2013) and blue evokes calmness (e.g., Fraser & Banks, 2004), thus suggesting that using such colors on packaging may help achieving specific positioning goals. Considering the growing interest of consumers and companies toward authentic and genuine food (e.g., Vega-Zamora et al., 2014; Bernal Jurado, et al., 2017), it becomes relevant to understand which hues of colors can transfer such associations to products. Recent trends[1] in packaging color show the increasing adoption of neutral and minimal colors, based on *hues of beige*, evoking the earth and natural elements for several food categories[2]. Although the literature offers relevant contributions on colors associations and effects, and despite the increasing diffusion in the marketplace of food packaging featuring hues of beige, little is known on consumer responses to this specific color family.

This research focuses on the analysis of the perceptual and semantic characteristics of such family of colors, which is defined here as *au naturel* colors. Based on a triangulation approach, *au naturel* colors are defined as *undyed, non-artificial, untreated, and unprocessed colors, that bring to mind something earthy, genuine, unadulterated, and expressing authenticity.* Hues of beige (e.g., cream, sandy beiges, and mellow browns) belong to this color family. This research examines the effects of *au naturel* colors featured in food packaging on consumer willingness to pay.

This paper reports the results of seven studies. The first two studies aim to verify the proposed conceptualization of *au naturel* colors vis-à-vis other colors. The next five experiments provide robust evidence that packaging featuring *au naturel* hues (*vs.* other hues) increases consumer willingness to pay for healthy food products. They also show, consistent with dual-process theories (Petty & Cacioppo, 1981; Chaiken, 1987), that the effect does not occur for food categories perceived as unhealthy. In addition, the presented empirical evidence rules out two potential alternative explanations of the results, based on the fit between the colors of the product and of the packaging, and on the lightness of the hues, controlling for the level of color saturation. Finally, this research shows that the relationship between *au naturel* colors featured in healthy food packaging and consumer willingness to pay is mediated by perceived product authenticity. The results prove to be robust across different food products and in comparison to multiple *non au naturel* hues.

This paper contributes to advance the understanding of the role of a frequently used element in packaging design – *au naturel* colors – in consumer purchase decisions. These results contribute to expand extant knowledge on color meanings and associations and extend prior literature on the effects of color by investigating when and how packaging featuring *au naturel* colors affects consumer willingness to pay for food products. Thus, this paper enriches color theory and its applications to marketing domains. The results of the presented

4

studies have also implications for firms and policy makers, by providing recommendations for the definition of marketing strategies and for consumer protection systems for healthy food products, respectively.

Conceptual Framework

Theoretical Background

Color influences consumer behavior in many marketing areas such as advertising (Meyers-Levy & Peracchio, 1995), store atmospherics (Bellizzi & Hite, 1992), logo design (Labrecque & Milne, 2012), product color naming (Skorinko, Kemmer, Hebl, & Lane, 2006) and product packaging (Mai et al., 2016). These studies have highlighted how consumers may use colors as heuristics in their evaluation processes. Heuristics are simple rules of inference that reduce one's effort in decision making situations, and are especially relevant for low involvement individuals who are not willing to engage in more extensive forms of processing (Chaiken, 1987). Color is a heuristic that triggers both cognitive and emotional associations. The next sections review existing research on color, with a specific focus on the effects of color in the domain of product packaging. These studies provide the theoretical foundations for the proposed conceptual framework, which includes the definition of *au naturel* colors and the research hypotheses.

Color research.

A few studies have focused on the individual natural propensity to respond to certain colors at a biological level. For example, red is intrinsically associated with arousal and stimulation (Crowley, 1993; Labrecque, Patrick, & Milne, 2013). A larger set of studies has instead focused on learned color associations, providing evidence that colors convey information and specific meanings (Elliot et al., 2007). Consumers use these color associations as cognitive

5

shortcuts (i.e., heuristics) to make inferences about products, particularly when they miss relevant knowledge on those products (Deval, Mantel, Kardes, & Posavac, 2013). These color associations are based on associative learning due to repeated pairings between specific colors and meanings occurring frequently in the environment (Labrecque et al., 2013). Individuals have learned that red objects attract attention (Puccinelli et al., 2013), blue is associated with calmness, competence, and efficiency (Fraser & Banks, 2004), white with cleanliness, hygiene and peace (Mahnke, 1996), gold with high status, prestige, exclusivity, and admiration (Drèze & Nunes, 2009; Anderson, Hildreth, & Howland, 2015), and brown with protection, seriousness, earthiness, support, and reliability (Wexner, 1954; Murray & Deabler, 1957; Fraser & Banks, 2004; Clarke & Costall, 2008). Another stream of literature has suggested that individuals associate colors with specific emotions (Levy, 1984). Red and blue are associated with happiness and sadness, respectively, and therefore they lead to cognitive processes and behaviors consistent with those emotions (Soldat, Sinclair, & Mark, 1997). By means of a qualitative investigation, Clarke and Costall (2008) analyzed the associations between colors and emotions. Their results showed that, for example, warm colors (e.g., red, orange, and yellow) evoke active emotions, whereas cool colors (e.g., blue and green) evoke sedative emotions.

Color in the domain of product packaging.

The role of packaging is focal in determining consumer expectations and impressions of the product. Indeed, elements of packaging design, such as shapes, materials and colors, act as communication tools and can create an additional value for the consumer (e.g., Yang & Raghubir, 2005; Chandon, 2013).

Color is one of the most important elements in the design of product packaging, and companies use different packaging colors to differentiate products and to attract consumers

(Hussain et al., 2015). Therefore, packaging color plays a pivotal role in communicating with customers since it can arouse interest towards a product and motivate customers to purchase it (Funk & Ndubisi, 2006). Past research has shown that different packaging colors influence consumer perceptions (e.g., Delaby, Balikdjian, & Pohl, 2011; Garber et al., 2000; Karnal, Machiels, Orth, & Mai, 2016). For example, consumers perceive milk desserts with black (*vs*. white or yellow) packaging as containing more chocolate (Ares & Deliza, 2010), drugs with red and brown packaging as more effective than with a green and yellow packaging (Roullet & Droulers, 2005), and products in blue packaging as healthier and are more likely to be purchased than products in red packaging (Huang & Lu, 2015). Packaging color novelty (i.e., a color very dissimilar from the original packaging color) increases purchase consideration (Garber et al., 2000). Light-colored packaging evokes two opposing effects: On the one hand, light colors enhance perceived healthiness (health effect) and, on the other hand, they activate detrimental taste inferences (taste effect, Mai et al., 2016). Because of these associations, consumers who have active health goals prefer products with light-colored packaging, whereas those who have an active indulgence goal avoid light-colored packaging. Mead and Richerson (2018) showed that packaging color saturation can bias consumers' food perceptions. Consumers rely on a judgment heuristic (Kahneman & Frederick, 2005), associating vivid, highly color-saturated food packaging with unhealthful food. Consequently, when seemingly indulgent food in vivid packaging is encountered, such heuristic is activated, the association feels familiar and fluent (Stafford & Grimes, 2012), and food is perceived as unhealthful.

Definition of *Au Naturel* Colors

This research focuses on a specific color family, *au naturel* colors. This specific label originates from the French language[3], where it refers to a simple cooking style or to a look

without make-up. The *au naturel* label is commonly used in the English language to identify something plain, in a natural state, simple, without dressing or make-up. Mirroring the linguistic definition of *au naturel*, this research uses this label to identify a color family including hues of beige (e.g., cream, sandy beiges, and mellow browns). The definition of *au naturel* colors features both perceptual characteristics and associated meanings, and is based on a triangulation approach, which integrates multiple sources: *a)* observation of *au naturel* hues, *b)* previous research on the color brown (the darkest of the *au naturel* hues, Wexner, 1954; Clarke & Costall, 2008), and *c)* results of a qualitative study. Observation of *au naturel* hues allowed us to define their perceptual characteristics, which in turn contribute to define, together with previous research on brown color and qualitative research, their meanings and learned associations. The triangulation approach started from the observation of the color itself as used in different examples of food packaging available in the marketplace. Using the RGB color model (a model in which red, green, and blue are combined in various ways to produce a broad array of colors), the hues of beige that were included in the family of *au naturel* colors are around RGB values of 207-170-132 (see Figure 1 for instances of hues). In terms of perceptual characteristics, the observation suggested that these hues are soft, neutral, undyed, and unprocessed.

– Insert Figure 1 about here –

How do consumers interpret these hues in terms of meanings and learned associations? Prior research has suggested that the color brown is linked to protection (Wexner, 1954; Murray & Deabler, 1957), support and reliability (Fraser & Banks, 2004), seriousness, nature, and earthiness (Clarke & Costall, 2008). What about beige hues? Considering together their perceptual features and the findings from previous studies on the darkest hue of beige (i.e.,

brown), one might associate *au naturel* colors with something that is natural, organic, and earthy. Being perceptually undyed and unprocessed makes *au naturel* colors conveying meanings such as coming spontaneously from the earth, being devoid of any artificial or chemical elements.

Since prior research is limited to the brown color, the authors conducted a qualitative study aimed to explore further associations elicited by *au naturel* hues. Ten in-depth, semi-structured interviews (5 males; 5 females; age range between 23 and 40 years) were conducted based on open-ended questions. One of the authors conducted the interviews either at the informants' house or at their place of business. The authors selected the sample of informants with the goal to ensure variability on socio-demographic variables, different levels of experience and familiarity with grocery shopping. Each interview lasted between 40 and 60 minutes and was fully transcribed. The interviewer probed informants about their opinions with regards to *au naturel* colors in terms of perceptual features and meanings. Initially, the interviewer used a first set of questions in spontaneous recall format, without showing a formal palette of colors, to investigate the appropriateness of the *au naturel* label, that is, if such label evokes hues of beige in the mind of respondents. Then, the interviewer used a second set of questions in prompted recall format, and showed a color palette containing selected hues of beige (e.g., cream, sandy beiges, and mellow browns). The answers provided by each informant to this second set were further investigated to access perceptions and beliefs associated with *au naturel* colors. In the last part of the interview, informants were asked to imagine a simulated product purchase. The interviewer presented two images of the same product (e.g., flour, potato chips, dark chocolate, nutrition bar, rice, popcorn, peanuts) featuring either beige or other-(e.g., red, blue, purple, green) colored packaging, were asked to describe the perceived differences between the two versions of the packaging, and to

discuss their opinions, reactions, and attitudes towards the two versions of the packaging and the product.

The authors analyzed the data by first reading the transcripts, taking notes of specific topics emerging from participants' answers and secondly by engaging in a coding process to identify common patterns and connections between the concepts elicited by informants. This procedure allowed to reconstruct the network of associations from *au naturel* colors to products featuring *au naturel*-colored packaging.

Answers to the first set of questions indicated that informants associate the term "*au naturel*" to something that is "*left as it is*" (e.g., food without any seasoning, or natural beauty, without make-up), without or at most with minimal interventions by humans. Thinking about the "*au naturel*" label, informants elicited "*raw materials, not yet treated and manipulated, and not transformed*". Also, "*au naturel*" evoked something "*raw and biological.*" Informants considered beige hues as consistent with the *au naturel* label because they associated it to something that is in a primitive state and not treated (i.e., a jute sack), thus providing confidence in the choice of such label. Answers to the second set of questions consistently suggested similar associations. In terms of perceptual features, informants described *au naturel* colors mostly as neutral and non-artificial, harmonious and inconspicuous, and also as soft and skin-like. Associations produced by informants implied that *au naturel* colors are natural, organic, earthy ("*it reminds* me of *something coming from the soil*"), wellness ("*it reminds something that arouses a feeling of well-being*"), and eco-friendly ("*it reminds something that is not harmful to the environment*").

In the last part of the interviews, the interviewer probed informants on products with packaging featuring both *au naturel* and *non au naturel* colors. Informants tended to associate products with *au naturel*-colored packaging with concepts such as "*genuine and authentic,*" "*natural*" and reported that the product "*looks like an organic product,*" having the quality of

10

being exactly as it appears to be. Informants evoked also associations such as "*artisanal,*" "*without additives,*" "*which has undergone fewer productive treatment*s," and "*homemade.*" In contrast, participants perceived products with *non au naturel*-colored packaging as more "*artificial,*" "*containing more flavoring,*" "*more processed*," and "*containing more artificial ingredients.*"

In sum, triangulating the observation of color characteristics, directions from previous research, and evidence obtained from the qualitative study, *au naturel* colors are defined as *undyed, non-artificial, untreated, and unprocessed colors that bring to mind something earthy, genuine, unadulterated, and expressing authenticity.* As previously discussed, the proposed definition of *au naturel* colors includes both their perceptual features (i.e., *undyed, non-artificial, untreated, and unprocessed colors*) and associated meanings (i.e., *that bring to mind something earthy, genuine, unadulterated, and expressing authenticity*). It is noteworthy that the family of *au naturel* colors does cover hues related to something resembling or suggestive of earth or soil and therefore associated with the concept of nature. However, it does not include hues of colors that are commonly found in nature but do not feature characteristics of being undyed or unprocessed and do not expresses authenticity (such as green or blue). The next section presents the research hypotheses on the effects of *au naturel* colors featured by a food packaging on consumer willingness to pay.

Research Hypotheses

Previous studies have proposed that colors "*carry specific meanings and communicate specific information*" (Elliot & Maier, 2007, p. 251), and can be persuasive heuristic processing cues (e.g., Frank & Gilovich, 1988; Fraser & Banks, 2004). Building upon the perceptual characteristics of *au naturel* colors (e.g., non-dyed, non-artificial, untreated, unprocessed) and the *au naturel* colors associations (e.g., something earthy, genuine,

unadulterated, and expressing authenticity), it is expected that food packaging featuring these hues is associated to more favorable consumer responses. Specifically, this research suggests that *au naturel*-colored packages will induce higher consumer willingness to pay.

Colors act as heuristics to activate associations that consumers use to make inferences about products. Therefore, consumers tend to project the perceptual features and the meanings of *au naturel* colors on the product itself. This implies that seeing a food product in *au naturel*-colored packaging leads consumers to believe that it is an unadulterated and natural product, and therefore more genuine and more authentic. These positive associations, transferred from the packaging colors to the product, increase consumer willingness to pay for that specific product, because consumers attach more value to genuine and authentic products. Therefore, *au naturel*-colored packaging (*vs. non au naturel*-colored packaging) will induce positive associations for a food product, thus leading to an increase in consumer willingness to pay. Formally:

H1: Consumers are willing to pay more for a food product when its packaging features *au naturel* colors (*vs. non au naturel* colors).

One might wonder whether the positive effect of *au-naturel* colored packaging on consumer willingness to pay generalizes to any food products. In order to examine a potential boundary condition for the effect of *au naturel* color, this research refers to dual-process theories (e.g., Elaboration Likelihood Model - Petty & Cacioppo, 1981; and Heuristic-Systematic Model – Chaiken, 1987). According to dual-process theories, consumers process information based on either a *central route* – that requires some amount of cognitive resources – or a *peripheral route* – that uses less effortful mechanisms such as heuristics – depending on their involvement to engage in information processing. Since packaging color can be considered as a heuristic, the effect of *au naturel*-colored packaging on consumer

willingness to pay is likely to be observed if the elaboration of information occurs via a peripheral route, but less likely to manifest itself if the elaboration occurs via a central route.

In line with this consideration, this research proposes that the effect of *au naturel*-colored packaging on consumer willingness to pay for a food product is contingent on the extent to which the product is perceived as harmful for consumer health. Specifically, when facing a food product commonly perceived as unhealthy, consumers perceive a higher level of risk (e.g., Klerck & Sweeney, 2007) that previous studies have recognized as an important antecedent of involvement (e.g., Laurent & Kapferer, 1985; Kapferer & Laurent, 1993; Rodgers & Schneider, 1993). The potential threat in terms of negative consequences for consumer health increases involvement and motivates consumers to process information following a central route (Petty, Cacioppo & Schumann, 1983). Therefore, as involvement increases, consumers devote more attention to product information and exert more effort in the elaboration process (Celsi & Olson, 1988). In this case, the use of color packaging as a heuristic is less likely to occur. Consequently, the effect of *au naturel*-colored packaging on willingness to pay will not be observed for food products commonly perceived as unhealthy. When facing healthy food products, consumers perceive lower levels of risk and are less involved to process information. The lower level of involvement lead consumers to follow a peripheral route and to engage in a less deliberate type of information processing based on the use of color as a heuristic (Chaiken, 1987). Formally:

H2: The perceived healthiness of the food category moderates the effect of *au naturel*-colored packaging on consumer willingness to pay. Specifically, the positive effect of *au naturel*-colored (*vs. non au naturel*-colored) packaging on consumer willingness to pay holds for healthy food categories, whereas the effect disappears for unhealthy food categories.

This research also investigates the mechanism underlying the effect of *au-naturel* colored packaging on consumer willingness to pay for healthy food products. Based on the perceptual characteristics and meanings that consumers associate to *au naturel* colors, the authors propose that the relationship between *au naturel*-colored packaging and consumer willingness to pay is mediated by perceptions of product authenticity. Perceived authenticity refers to consumers' beliefs or expectations about a product to be genuine, real, and/or true (e.g., Grayson & Martinec, 2004; Beverland & Farrelly, 2010). Previous studies have analyzed product authenticity in different consumption contexts, such as fast food (Beverland & Farrelly, 2010), green or environmentally conscious consumption (Ewing, Allen & Ewing, 2012), traditional food specialties (Sidali & Hemmerling, 2014), and handmade products (Fuchs, Schreier, & van Osselaer, 2015), showing that perceived authenticity influences consumer evaluations and dispositions. In the context of this research, based on the proposed conceptualization and the evidence gathered from the qualitative study, the concept of product authenticity refers to the extent to which a product is perceived to be organic and genuine, and thus authentic. These positive associations are elicited by the perceptual features and the meanings of *au naturel* colors and are used by consumers as heuristics within the peripheral route to information processing activated for healthy food products (Chen & Chaiken, 1999). Based on this product authenticity-based mechanism, consumers who are exposed to *au naturel*-colored packaging on healthy food tend to consider the product to be natural, uncontaminated, and containing only organic ingredients. Thus, *au naturel* colors on food packaging elicit specific associations based on perceptions of something true, genuine or authentic. Therefore, it is expected that *au naturel*-colored packaging (*vs. non au naturel*-colored packaging) will generate perceptions of product authenticity that, in turn, produce higher willingness to pay. Formally:

H3: Product authenticity mediates the effect of *au naturel*-colored (vs. *non au naturel*-colored) packaging on consumer willingness to pay.

Validating the *Au Naturel* Colors Conceptualization

This section presents the results of two studies that were designed to verify the proposed definition of *au naturel* colors. These studies aimed to understand how consumers perceive different color hues and to verify whether the hues identified as *au naturel* feature the main perceptual characteristics and associations of *au naturel* colors. In both studies, considering the centrality of color, participants who indicated that they were colorblind were thanked and debriefed but could not proceed with the studies.

Study 1A

Study 1A aimed to test whether *au naturel* colors generally feature the *au naturel* characteristics and associations as measured by means of a set of quantitative indicators.

Stimuli.

An initial set of 50 stimuli was created by modifying pictures of existing product packaging using Adobe® Photoshop®. Each stimulus was reproduced in different colors (*au naturel vs. other colors*). The *au naturel* condition used three different hues of beige ranging from a lighter one to a darker one (i.e., cream, sandy beiges, and mellow browns); the other colors condition used different hues (i.e., red, light blue, fuchsia, dark blue, purple, and white) to ensure generalizable results. The only visual difference between stimuli featuring the same packaging was the color; everything else (e.g., size, shape, logo) was identical across versions. Upon brainstorming with two marketing experts, 13 different product categories were selected.

Design and participants.

Study 1A was a 2 (color: *au naturel vs.* other colors) by 13 (product category: pasta, popcorn, sugar, chocolate, coffee, peanuts, flour, rolling paper, tobacco, beef, peanut butter, pain killer ointment, vitamins) between-subjects design. Participants ($N = 258$; 45.7% females; $M_{age} = 31.41$; $SD_{age} = 9.50$) were recruited from Amazon's Mechanical Turk (AMT), and were randomly assigned to one of the 26 conditions set up in an online Qualtrics survey.

Measures.

Participants evaluated the packaging corresponding to their condition on nine 7-point items: Seven items designed to capture the characteristics of *au naturel* colors (*Au Naturel Colors Scale* − ANCS; 1 = not at all, 7 = very much; see Table 1), and two control items to assess familiarity with the product packaging (1 = not familiar, 7 = very familiar) and typicality of the packaging color for that specific product category (1 = not at all, 7 = very much).

− Insert Table 1 about here −

Results.

Cronbach alpha was .94 and item-to-total correlations were larger than .75 for the seven ANCS items. A maximum likelihood exploratory factor analysis yielded a one-factor solution (cumulative explained variance = 70.04%, factor loadings higher than .77; see Table 1). These results suggest that indeed the seven items converged onto a common latent factor, which represents the *au naturel* colors. Accordingly, mean scores of the *Au Naturel Colors Scale* (ANCS) were computed.

Results of a one-way ANOVA on ANCS scores considering the three used hues of beige (i.e., lighter, medium, darker) showed no significant differences ($M_{Lighter} = 5.80$, $SD =$

.85, M_{Medium} = 5.66, SD = .83, M_{Darker} = 5.57, SD = 1.05; $F(2,125)$ = .69, p = .51). Therefore, the three hues of beige were collapsed into a unique class of color (i.e., *au naturel* colors).

A first one-way ANOVA showed that ANCS scores were significantly higher for au naturel colors compared to other colors ($M_{AuNaturel}$ = 5.68, SD = .90; M_{Other} = 3.47, SD = 1.39; $F(1,256)$ = 227.24, $p < .001$). A second one-way ANOVA, in which individual packaging colors were considered, revealed that ANCS scores were significantly different between au naturel and each of the other six levels of colors ($M_{AuNaturel}$ = 5.66, SD = .90; M_{Red} = 3.39, SD = 1.40; $M_{LightBlue}$ = 3.41, SD =1.52; M_{Purple} = 2.47, SD = .78; $M_{Fuchsia}$ = 3.45, SD = 1.30; M_{Blue} = 4.13, SD = 1.08; M_{White} = 4.67, SD = .99; $F(6,251)$ = 44.58, $p < .001$). Planned comparisons showed that hues of beige are more associated with *au naturel* features than any other colors (all ps < .05).

Finally, a two-way ANOVA on ANCS scores with color (*au naturel vs.* other colors) and product category as between-subject factors confirmed a significant main effect of color ($M_{AuNaturel}$ = 5.68, SD = .90; M_{Other} = 3.47, SD = 1.39; $F(1,232)$ = 249.64, $p < .001$). The results also showed a significant main effect of product category (M_{Pasta} = 4.49, SD = 1.30; $M_{Popcorn}$ = 4.67, SD = 1.45; M_{Sugar} = 4.50, SD = 2.04; $M_{Chocolate}$ = 3.99, SD = 1.83; M_{Coffee} = 4.57, SD = 2.17; $M_{Peanuts}$ = 4.88, SD = 1.82; M_{Flour} = 4.35, SD = 1.56; $M_{Rolling\ papers}$ = 3.77, SD = 1.62; $M_{Tobacco}$ = 4.72, SD = 1.10; M_{Beef} = 5.27, SD = 1.04; $M_{Peanuts\ butter}$ = 4.52, SD = 1.38; $M_{Pain\ killer}$ = 4.70, SD = 1.43; $M_{Vitamins}$ = 4.89, SD = 1.69; $F(12,232)$ = 2.27, p = .010), and a significant interaction between color and product category ($F(12,232)$ = 2.08, p = .019). Planned comparisons showed that hues of beige obtained significantly higher ANCS scores than other colors for all the product categories used in this study (all ps < .05), although with differential intensities. Results of two one-way ANOVAs showed no significant differences between *au naturel* and other-colors packaging in terms of familiarity ($M_{AuNaturel}$ = 1.66, SD = 1.28; M_{Other} = 1.86, SD = 1.56; $F(1,256)$ = 1.23, p = .27) and typicality ($M_{AuNaturel}$ = 3.60, SD

= 1.49; M_{Other} = 3.38, SD = 1.68; $F(1,256)$ = 1.20, p = .27). These findings imply that *au naturel vs.* other-colors packaging were equally familiar and typical. Overall, these results indicate that beige hues indeed reflect the characteristics of the *au naturel* colors family better than other colors.

Study 1B

Study 1B aimed to gather further support for the proposed definition of *au naturel* colors and to compare beige hues with other colors not included in study 1A, that could trigger associations with nature similar to *au naturel* colors. Specifically, *green* could be perceived as *au naturel* because it evokes nature imagery (Evans, de Challemaison, & Cox, 2010).

Design and participants.

Study 1B was a 3 (color: *au naturel vs.* green *vs.* red) by 10 (product category: butter, aspirin, tobacco, rolling paper, potato chips, couscous, green beans, rice, vitamins, and yogurt) between-subjects design. Participants were 297 AMT workers (41.4% females; M_{age} = 34.74, SD_{age} = 10.58). Study 1B used the same procedure and measures as in study 1A.

Results.

ANCS showed a Cronbach alpha of .93 and item-to-total correlations were larger than .62 for all of the items. A confirmatory factor analysis showed a good fit to the data ($\chi^2(14)$ = 45.29, p < .001, CFI = .99, SRMR = .03). All standardized loadings were substantial and significant (λs > .69, all ps < .001; see Table 1), AVE was .68, and construct reliability was .94. These findings allowed to confidently accept ANCS as an effective measurement instrument of *au naturel* colors features. Accordingly, the seven items were averaged to obtain an overall ANCS score.

Results of a one-way ANOVA on ANCS scores considering the three used hues of beige (i.e., lighter, medium, darker) showed no significant differences between the three levels ($M_{Lighter}$ = 5.61, SD = .99, M_{Medium} = 5.78, SD = .76, M_{Darker} = 5.50, SD = .88; $F(2,99)$ = .98, p = .38). Therefore, the three hues of beige were collapsed into a unique class of color (i.e., *au naturel* colors).

Results of a one-way ANOVA showed that ANCS scores were significantly different among the three levels of color ($M_{AuNaturel}$ = 5.65, SD = .87; M_{Green} = 4.07, SD = 1.32; M_{Red} = 3.06, SD = 1.43; $F(2,294)$ = 114.67, p < .001). Beige hues are more associated with *au naturel* features than red ($F(1,294)$ = 225.63, p < .001) and, more important, than green ($F(1, 294)$ = 81.34, p < .001). Finally, a two-way ANOVA on ANCS scores with color and product category as between-subject factors confirmed a significant main effect of color ($M_{AuNaturel}$ = 5.65, SD = .87; M_{Green} = 4.07, SD = 1.32; M_{Red} = 3.06, SD = 1.43; $F(2,267)$ = 146.17, p < .001). The results also showed a significant main effect of product category (M_{Butter} = 4.11, SD = 1.71; $M_{Aspirins}$ = 4.33, SD = 1.26; $M_{Tobacco}$ = 4.03, SD = 1.77; $M_{Rolling\ papers}$ = 4.12, SD = 1.74; M_{Chips} = 3.84, SD = 1.66; $M_{Coucous}$ = 4.08, SD = 1.86; M_{Beans} = 5.38, SD = .83; M_{Rice} = 4.75, SD = 1.59; $M_{Vitamins}$ = 4.57, SD = 1.31; M_{Yogurt} = 3.42, SD = 1.70; $F(9,267)$ = 7.26, p < .001), and a significant interaction between color and product category ($F(18,267)$ = 2.76, p < .001). Planned comparisons showed that hues of beige obtained higher ANCS scores than other colors for most product categories used in this study (all ps < .05, except for aspirins (*vs*. green, p = .20) and beans (*vs*. green and red, both p = .16). The results of two one-way ANOVAs showed no significant differences between *au naturel* and other colors in terms of familiarity ($M_{AuNaturel}$ = 2.86, SD = 2.11; M_{Green} = 2.53, SD = 2.05; M_{Red} = 2.45, SD = 1.99; $F(2,294)$ = 1.16, p = .32) and typicality ($M_{AuNaturel}$ = 3.15, SD = 1.47; M_{Green} = 3.21, SD = 1.41; M_{Red} = 3.27, SD = 1.73; $F(2,294)$ = .16, p = .85). Overall, this evidence suggests that beige hues hold the defining characteristics of *au naturel* colors.

This section presents the results of five experiments that test the research hypotheses and rule out two potential alternative explanations for the effect of *au naturel* (*vs. non au naturel*)-colored packaging on consumer willingness to pay. In all the studies, considering the focus on the effects of color, participants who declared to be colorblind were thanked and debriefed but could not proceed with the studies. Figure 2 shows the experimental stimuli used in the studies, which allowed to test the research hypotheses with regard to different product categories (i.e., rice, butter, carrots, flour, extra dark chocolate) and several colors (i.e., beige, red, orange, blue, green, purple).

– Insert Figure 2 about here –

Study 2: The Effect of Packaging Color on Willingness to Pay and the Moderating Effect of Product Category

Design, participants, and procedure.

Study 2 aimed to test H_1 and H_2. One hundred ninety-eight participants (38.9% females; M_{Age} = 34.78; SD_{Age} = 10.67) were recruited from AMT and were randomly assigned to one of four conditions in a 2 (packaging color: *au naturel*, beige *vs. non au naturel,* red) by 2 (product category: healthy, rice *vs.* unhealthy, butter) between-subjects design. The authors selected rice as a healthy product category and butter as an unhealthy product category based on the results of a pre-test (N = 38 undergraduates; 55.3% females, M_{Age} = 21.68; SD_{Age} = 1.14) on the perceived riskiness of the food (7-point scale, 1 = *not at all risky*, 7 = *very risky*, M_{Rice} = 2.18; SD_{Rice} = 1.18; M_{Butter} = 4.97; SD_{Butter} = 1.57; $t(1,37)$ = -7.54, $p < .001$). The pre-test also revealed that participants were more likely to engage in deliberative cognitive processing (7-

point scale, 1 = *not at all careful*, 7 = *very careful*) when evaluating butter rather than rice (M_{Rice} = 3.37; SD_{Rice} = 1.82; M_{Butter} = 4.34; SD_{Butter} = 2.04; $t(1,37)$ = - 2.20, p = .034). The manipulation of packaging color was realized by changing the hue of the packaging (beige *vs.* red), while keeping the other elements constant for each conditions. Based on the HSB model (an additive model of colors based on Hue, Saturation, and Brightness), saturation was approximately 40%, and brightness was approximately 80% for the beige conditions, while saturation was approximately 60%, and brightness was approximately 90% for the red conditions[4]. The dependent variable, willingness to pay for the product (WTP), was measured by means of an open-ended question *("How much would you be willing to pay for this product?")*.

Results and discussion.

A two-way ANOVA showed a significant main effect of packaging color on willingness to pay for the product ($WTP_{AuNaturel\_Beige}$ = $4.52; SD = 3.84; $WTP_{Non\ AuNaturel\_Red}$ = $3.22, SD = 2.67; $F(1,194)$ = 8.73, p = .004), supporting H_1. A significant effect of product category was also found ($WTP_{Healthy\_Rice}$ = $4.89; SD = 4.29; $WTP_{Unhealthy\_Butter}$ = $2.82; SD = 1.39; $F(1,194)$ = 22.53, $p < .001$). Consistent with H_2, the results showed a significant two-way interaction between packaging color and product category ($F(1,194)$ = 4.76, p = .03). Planned comparisons showed that WTP for rice was significantly higher when its packaging featured *au naturel* colors than *non au naturel* colors ($WTP_{AuNaturel\_Beige}$ = $6.05; SD = 4.81; $WTP_{Non\ AuNaturel\_Red}$ = $3.78; SD = 3.42; $F(1, 194)$ = 13.32, $p < .001$), whereas WTP for butter was not significantly different in the two color conditions ($WTP_{AuNaturel\_Beige}$ = $2.99*; SD = 1.38; $WTP_{Non\ AuNaturel\_Red}$ = $2.65; SD = 1.39; $F(1,194)$ = .29, p = .59). Since a Levene test suggested heterogeneous variances between groups ($F(3,194)$ = 13.080, $p < .001$), the model was re-estimated using standard errors robust to heteroskedasticity. Results and inferential

conclusions remain the same ($b_{PackagingColor}$ = 1.307, p = .004; $b_{ProductCategory}$ = 2.099, p < .001; $b_{PackagingColor*ProductCategory}$ = 1.930, p = .032). Figure 3 illustrates these results.

– Insert Figure 3 about here –

The results of study 2 provide support for H_1 and H_2 and confirm that *au naturel*-colored packaging increases WTP for a product compared to *non au naturel*-colored packaging, but only for healthy products. One might argue that because the color of rice is very close to the color of *au naturel* packaging, the effect observed may be due to the match between the color of the product and that of the packaging. Indeed, several theories in consumer behavior (e.g., balance theory – Heider, 1958, theory of cognitive dissonance – Festinger, 1957) suggest the general idea that individuals strive for consistency in their evaluations, and that fit in stimuli improves evaluations of those stimuli. Study 3 was conducted to rule out this alternative explanation, by adapting the design of study 2 and using two different products. It is expected to observe the effect of *au naturel* (*vs. non au naturel*) hues on WTP irrespective of the fit between product color and packaging color. Since in study 2 the effect was observed only for healthy product categories, we focus on these categories for subsequent studies.

Study 3: Ruling Out an Alternative Explanation Based on Color Fit

Design, participants, and procedure.

Study 3 aimed to rule out an alternative color fit-based explanation and to gather further support for H_1. To test the generalizability of the effects observed in study 2, we used a different product category and a different *non au naturel*-colored packaging. Two hundred

and twelve participants (50% females; $M_{Age} = 35.86$; $SD_{Age} = 11.65$) were recruited from AMT and randomly assigned to one of four conditions in a 2 (packaging color: *au naturel, beige vs. non au naturel*, orange) by 2 (product color: *au naturel*, beige *vs. non au naturel*, orange) between-subjects design. The authors selected rice (beige product color) and carrots (orange product color) as stimuli for this study based on the results of a pre-test ($N = 35$ undergraduates; 65.7% females, $M_{Age} = 22.11$; $SD_{Age} = 1.39$) on the perceived riskiness of food (7-point scale, 1 = *not at all risky*, 7 = *very risky*; $M_{Rice} = 1.40$; $SD_{Rice} = .74$; $M_{Carrots} = 1.23$; $SD_{Carrots} = .88$; $t(1,34) = 1.43$, $p = .160$). The manipulation of packaging color was realized by changing the color of the packaging (beige *vs.* orange) while keeping the other elements constant for both conditions. Based on the HSB model, saturation was approximately 40%, and brightness was approximately 80% for the beige conditions, while saturation was approximately 70%, and brightness was approximately 90% for the orange conditions (see endnote 5). WTP was measured as in study 2.

Results and discussion.

The results of a two-way ANOVA showed a significant main effect of packaging color ($WTP_{AuNaturel\_Beige} = \$5.58$, $SD = 4.54$; $WTP_{Non\ AuNaturel\_Orange} = \$3.07$, $SD = 2.28$, $F(1,208) = 25.73$, $p < .001$), thus supporting H$_1$. The effect of product color ($WTP_{AuNaturel\_Rice} = 4.58\$$, $SD = 3.97$; $WTP_{Non\ AuNaturel\_Carrots} = 4.09\$$, $SD = 3.63$; $F(1,208) = .82$, $p = .37$), and the interaction effect of packaging color and product color ($F(1,208) = 2.26$, $p = .13$) were both non-significant. Planned comparisons showed that WTP for rice was significantly higher in the *au naturel*-colored packaging condition than in the orange-colored packaging condition ($WTP_{AuNaturel\_Beige} = \$5.44$, $SD = 4.64$; $WTP_{Non\ AuNaturel\_Orange} = \$3.67$, $SD = 2.88$; $F(1,208) = 6.43$, $p = .012$). The same pattern holds for carrots ($WTP_{AuNaturel\_Beige} = \$5.73$, $SD = 4.67$; $WTP_{Non\ AuNaturel\_Orange} = \$2.48$, $SD = 1.23$; $F(1,208) = 21.42$, $p < .001$). Since a Levene test

suggested heterogeneous variances between groups ($F(3,208) = 10.32$, $p < .001$), the model

was re-estimated using standard errors robust to heteroskedasticity. Results and inferential

conclusions remain the same ($b_{PackagingColor} = 2.50$, $p < .001$; $b_{ProductColor} = .45$, $p = .37$;

$b_{PackagingColor*ProductColor} = -1.484$, $p = .14$). These results replicate those observed in study 2

for rice and show that *au naturel*-colored packaging has a significant effect on WTP

irrespective of the fit between product and packaging colors. Figure 4 illustrates these results.

– Insert Figure 4 about here –

These findings suggest that the effect of packaging color on consumer willingness to

pay holds regardless of the fit between product color and packaging color. Beyond offering

further support for the investigated effect, results of the analysis show that consumers are also

willing to pay more for orange products (i.e., carrots) in *au naturel*-colored packaging than in

orange-colored packaging, and provide preliminary evidence of the generalizability of the

proposed effects.

Study 4: Ruling Out an Alternative Explanation Based on Color Lightness

Design, participants, and procedure.

Study 4 aimed to obtain additional support for H$_1$ by providing evidence of the

generalizability of the proposed effect against a different *non au naturel* color (i.e., blue), and

to rule out an alternative explanation based on the lightness of the packaging color. Recent

research in the domain of food packaging has shown that color intensity (i.e., light *vs.* dark)

can affect healthiness and taste perceptions as well as consumer purchase intention (Mai et

al., 2016; Sunaga, Park, & Spence, 2016). It is therefore important to verify that the effect of

au naturel packaging color on WTP is robust to different lightness levels. Moreover, study 4 used stimuli with equal levels of saturation, which a recent contribution suggested as a relevant determinant of perceived healthfulness of products (Mead & Richerson, 2018). Whereas studies 2 and 3 used as *non au naturel* colors red and orange – which have saturation and lightness levels (the latter measured through the brightness dimension of the HSB model) that are intrinsically different from beige – study 4 adopted blue as *non au naturel* color, keeping saturation levels equal across conditions and explicitly manipulating lightness. In fact, it is possible to identify a blue hue sharing the same levels of saturation as beige, but it is not possible to keep beige, red, and orange at the same level of saturation. Finally, study 4 also tests H3, the proposed mechanism driving the effect of packaging color on WTP, that is, product authenticity.

Two hundred and four US participants (58.8% females; $M_{age} = 32.64$; $SD_{Age} = 9.74$) recruited from Prolific Academic took part in the study. Participants were randomly assigned to one of four conditions in a 2 (packaging color: *au naturel,* beige *vs. non au naturel*, blue) by 2 (color lightness: light *vs.* dark) between-subjects design. Packaging color was manipulated and WTP was measured as in prior studies. The lightness of the packaging was manipulated across conditions (see Figure 2); saturation was kept constant at approximately 40% across conditions. Other elements of the packaging were held constant as well. Based on the HSB model, the light stimuli were created setting brightness approximately to 80% for the light condition, and the dark stimuli were created setting brightness approximately to 45% for the dark condition. WTP was measured as in studies 2 and 3, while the concept of *product authenticity* was captured by four 7-points items ("*Looking at the color of this product packaging, I think that this product is authentic"; "is genuine"; "is organic*"; and "*does not contain chemical additives*") asking to indicate the extent to which participants agree or disagree (1 = strongly disagree, 7 = strongly agree) with the statements. The four items used

to measure the intended mediating variable (i.e., *product authenticity*) showed a Cronbach alpha of .81, and item-to-total correlations were larger than .40 for all the items. Therefore, an average score of *product authenticity* was created. As a manipulation check, participants evaluated the packaging on a 7-point semantic differential item ("*To what extent do you think that the color of this packaging is light or dark?*" (1 = *very light* to 7 = *very dark*)).

Results and discussion.

Results of an independent sample *t test* showed a significant effect of color lightness (M_{Light} = 2.95, SD = 1.26; M_{Dark} = 5.51, SD = .98; $t(1,202)$ = - 16.27, $p < .001$), thus supporting the manipulation of lightness even in terms of perception.

A two-way ANOVA on WTP showed a significant main effect of packaging color ($WTP_{AuNaturel\_Beige}$ = \$5.26; SD = .33; $WTP_{Non\ AuNaturel\_Blue}$ = \$3.97; SD = .33; $F(1,200)$ =7.51, p = .007), replicating the results of studies 2 and 3. The effect of color lightness (WTP_{Light}= \$4.65; SD = .34; WTP_{Dark} = \$4.58; SD = .33; $F (1,200)$ = .03, p = .87), and the interaction effect of packaging color and color lightness ($F (1,200)$ = .41, p = .52) were both non-significant. Since a Levene test suggested heterogeneous variances between groups ($F(3,200)$ = 4.28, p = .006), the model was re-estimated using standard errors robust to heteroskedasticity. Results and inferential conclusions remain the same ($b_{PackagingColor}$ = 1.29, p = .007; $b_{ColorLightness}$ = - .08, p = .87; $b_{PackagingColor*ColorLightness}$ = .60, p = .52). Thus, the results can be explained by the characteristics of *au naturel*-colored packaging, but not by the lightness of the packaging color. Figure 5 illustrates these results.

– Insert Figure 5 about here –

26

A mediation analysis (Hayes, 2013) was conducted to test the underlying mechanism outlined in H3 (packaging color → product authenticity → WTP). The results of a mediation analysis revealed a significant total effect of packaging color on WTP ($c = 1.30$; $p = .006$); a significant effect of packaging color on *product authenticity* ($a = .29$, $p = .039$); a significant effect of *product authenticity* on WTP ($b = .51$, $p = .030$); and a significant direct effect of packaging color on WTP ($c' = 1.15$, $p = .015$), when controlling for *product authenticity*. The indirect effect was .15, with a 95% bias-corrected bootstrap confidence interval based on 5000 resamples of [.02; .41]. This result indicates a significant indirect effect and supports the prediction that *product authenticity* mediates the effect of packaging color on willingness to pay. Figure 6 illustrates results of the mediation analysis.

– Insert Figure 6 about here –

Overall, the results provide further support for effect of *au naturel*-colored packaging on consumer willingness to pay for a product through a *product authenticity*-based mechanism. More important, the results suggest that the effect holds irrespective of the lightness of the packaging colors and controlling for saturation.

The Generalizability of the Proposed Effect on New Hues of Color and New Product Categories

This section presents the results of two studies that were designed to test the generalizability of the proposed effect against two new hues of *non au naturel* colors (i.e., green and purple), and on two new product categories (i.e., flour and extra dark chocolate). The authors selected flour and extra dark chocolate as healthy product categories ($M_{Flour} = 2.98$; $SD_{Flour} = 1.48$; $M_{Choco} = 2.78$; $SD_{Choco} = 1.35$); $t(1,39) = .72$, $p = .476$) based on the results of a pre-test on the

perceived riskiness of food (7-point scale, 1 = *not at all risky*, 7 = *very risky*; $N = 40$ undergraduates; 57.5% females, $M_{Age} = 22.05$; $SD_{Age} = 1.43$). Additionally, these two studies offer further testing of the *product authenticity*-based mechanism. Finally, the two studies investigate the effect of packaging color on an additional outcome variable, that is, *trust toward the product*, which previous studies related to healthy food and authenticity (Moulard, Raggio, & Folse, 2016; Nuttavuthisit, & Thøgersen, 2017).

Study 5A: design, participants, and procedure.

Study 5A aimed to obtain further support for H_1 and H_3 against a new hue of *non au naturel* color (i.e., green), and on a new product (i.e., flour). Packaging color (*au naturel*, beige *vs. non au naturel*, green) was manipulated in a between-subjects design, holding constant flour as product category. One hundred and one US participants (53.5% females; $M_{age} = 33.18$; $SD_{age} = 10.18$) recruited from Prolific Academic took part in the study and were randomly assigned to one of the two conditions. The manipulation of packaging color was realized by changing the hue of the packaging (beige *vs.* green), while keeping the other elements constant for both conditions. Based on the HSB model, saturation was approximately 40%, and brightness was approximately 80% for both conditions. WTP and *product authenticity* (α = .76, item-to-total correlations $\geq$ .23) were measured as in study 4. Trust toward the product was captured by two 7-points items asking to indicate the extent to which participants agree or disagree (1 = strongly disagree, 7 = strongly agree) with the statements ("*Looking at the color of this product packaging, I think that this product is…: reliable; trustworthy*"; adapted from Sirdeshmukh, Singh, & Sabol, 2002). The two items showed a Cronbach alpha of .82, and item-to-total correlations were larger than .70 for all the items. Therefore, an average score of *trust toward the product* was created.

Results and discussion.

Results of a one-way ANOVA on WTP with packaging color as a between-subjects factor showed that participants were willing to pay more for the product when it featured *au naturel*-colored packaging ($WTP_{AuNaturel\_Beige}$ = \$4.28, SD = 2.31) than *non au naturel*-colored packaging ($WTP_{Non\ AuNaturel\_Green}$ = \$3.34, SD = 1.60, $F(1,99)$ = 5.65, p = .019). Since a Levene test suggested heterogeneous variances between groups ($F(1,99)$ = 4.50, p = .036), the model was re-estimated using standard errors robust to heteroskedasticity. Results and inferential conclusions remained the same (b_{Color} = .94, p = .021). Results of a one-way ANOVA on *trust toward the product* with packaging color as a between-subjects factor showed that participants trusted more the product when it featured *au naturel*-colored packaging ($Trust_{AuNaturel\_Beige}$ = 5.31, SD = 1.04) than *non au naturel*-colored packaging ($Trust_{Non\ AuNaturel\_Green}$ = 4.67, SD = 1.16, $F(1,99)$ = 8.64, p = .004).

Results of a mediation analysis revealed a significant total effect of packaging color on WTP (c = .94; p = .019); a significant effect of packaging color on product authenticity (a = .53, p = .007); a significant effect of product authenticity on WTP (b = .42, p = .040); and a marginally significant direct effect of packaging color on WTP (c' = .71, p = .079), when controlling for product authenticity. The indirect effect was .22, with a 95% bias-corrected bootstrap confidence interval based on 5000 resamples of [.05; .51], providing further evidence that product authenticity mediates the effect of packaging color on willingness to pay. A mediation analysis considering trust toward the product as dependent variable yielded similar results, suggesting that product authenticity mediates also the effect of packaging color on trust toward the product.

Overall, the results of study 5A provide further support for effect of *au naturel*-colored (*vs. non au naturel*-colored) packaging on WTP for a product through a product authenticity-based mechanism. Moreover, findings of study 5a allow generalizing the predicted effect and

mechanism on a new product category, flour, versus a different non au naturel color, green, and on an additional dependent variable, trust toward the product.

Study 5B: design, participants, and procedure.

Study 5B aimed to obtain further support for H_1 and H_3 against a new hue of *non au naturel* color (i.e., purple) and on a new product category (i.e., extra dark chocolate). Packaging color (*au naturel*, beige *vs. non au naturel*, purple) was manipulated in a between-subjects design, holding constant the product category. One hundred and four US participants (62.5% females; $M_{Age} = 30.98$; $SD_{Age} = 8.51$) recruited from Prolific Academic took part in the study and were randomly assigned to one of the two conditions. The manipulation of packaging color was realized by changing the hue of the packaging (beige *vs.* purple), while keeping the other elements constant for both conditions. Based on the HSB model, saturation was approximately 40%, and brightness was approximately 80% for both conditions. WTP, *product authenticity* ($\alpha = .85$, item-to-total correlations $\geq .45$), and *trust toward the product* ($\alpha = .86$, item-to-total correlations $\geq .75$), were measured as in previous studies.

Results and discussion.

Results of a one-way ANOVA on WTP with packaging color as a between-subjects factor showed that participants were willing to pay more for the product when it featured *au naturel*-colored packaging ($WTP_{AuNaturel\_Beige} = \$3.35$, $SD = 1.30$) than *non au naturel*-colored packaging ($WTP_{Non\ AuNaturel\_Purple} = \$2.71$, $SD = 1.39$, $F(1,102) = 5.94$, $p = .017$). Results of a one-way ANOVA on *trust toward the product* with packaging color as a between-subjects factor showed that participants trusted more the product when it featured *au naturel*-colored packaging ($Trust_{AuNaturel\_Beige} = 5.04$, $SD = 1.07$) than *non au naturel*-colored packaging ($Trust_{Non\ AuNaturel\_Purple} = 4.49$, $SD = 1.13$, $F(1,102) = 6.43$, $p = .013$).

Results of a mediation analysis revealed a significant total effect of packaging color on WTP ($c = .64$; $p = .017$); a significant effect of packaging color on *product authenticity* ($a = .96$, $p < .001$); a significant effect of *product authenticity* on WTP ($b = .31$, $p = .007$); and a not significant direct effect of packaging color on WTP ($c' = .34$, $p = .221$), when controlling for product authenticity. The indirect effect was .30, with a 95% bias-corrected bootstrap confidence interval based on 5000 resamples of [.09; .63], providing further evidence that product authenticity mediates the effect of packaging color on willingness to pay. A mediation analysis considering trust toward the product as dependent variable yielded similar results, again suggesting that product authenticity mediates also the effect of packaging color on trust toward the product.

Overall, the results of study 5B provide further evidence supporting the effects of *au naturel*-colored (*vs. non au naturel*-colored) packaging on WTP and trust toward the product, and the related product authenticity-based mechanism. Findings allow the generalization of the predicted effects to a new product category, extra dark chocolate, against a different non *au naturel* color, purple.

General Discussion

This research introduces a new color family that is defined as *au naturel* colors, and proposes that consumers associate these hues with specific features and meanings that increase their willingness to pay for healthy food products through an authenticity-based mechanism. The first two studies provided support to the proposed conceptualization of *au naturel* colors, and the next five experiments consistently showed that *au naturel*-colored packaging enhances consumer willingness to pay for healthy food, also demonstrating that the effect of *au naturel colors* does not occur for food categories perceived as unhealthy. The presented empirical evidence allowed to rule out two potential alternative explanations for the proposed effect,

based on the fit between the color of the packaging and of the product, and on color lightness controlling for saturation, respectively. Furthermore, the findings demonstrated that the relationship between *au naturel* colors featured in healthy food packaging and consumer willingness to pay is explained by the perceived authenticity of the product. The results were consistent considering different food categories, different levels of saturation and lightness, and comparing *au naturel* colors to different hues of other colors. The next sections discuss the theoretical and practical implications of these results, and propose some directions for future research.

Theoretical Contribution

This research contributes to the marketing literature along several directions. The first contribution consists of the conceptualization of a new color family – *au naturel* colors – which is increasingly used in the marketplace but has not received attention from marketing scholars. Whereas prior research has focused predominantly on the effects of primary colors (e.g., red and blue) and of general color dimensions (e.g., light/dark, warm/cold), a more recent stream of research started producing interesting evidence on the effects of more specific color hues (e.g., Lee, Noble, & Biswas, 2016; Drèze & Nunes, 2009). This research integrates such research stream by defining *au naturel* colors and empirically testing their effects on consumer willingness to pay in the domain of food packaging.

The second area of contribution of this research is food *packaging*. The marketing literature has long clarified the impact on consumer behavior of perceptual elements in packaging (e.g., Garber et al., 2000; Funk & Ndubisi, 2006; Mai et al., 2016). More recent articles have elaborated on the roles of textual claims and nutrition icon systems. The presence of "natural" claims (e.g., all-natural, 100% natural) on product packaging enhances product perceived healthiness and purchase intentions (Berry, Burton, & Howlett, 2017).

Also, reductive front-of-package (e.g., Guideline Daily Amount) and evaluative front-of-package (e.g., Smart Choices) nutrition icon systems support consumers in evaluating product healthiness relative to the Nutrient Facts Panels alone (Newman et al., 2018). This research contributes to this line of work by clarifying the role of the *au naturel* colors in the perception of food packaging features. Importantly, whereas previous studies have mostly examined the effects of packaging color on healthiness and taste perception (Huang & Lu, 2015; Mai et al., 2016), perception of drug potency (Roullet & Droulers, 2005), and brand and purchase consideration (Garber et al., 2000), this research contributes to the literature by proposing and demonstrating the contingencies and the mechanism through which *au naturel*-colored packaging influences a front-end criterion variable such as consumer willingness to pay, and a relational outcome such as trust toward food products.

Third, this research relates to the literature on dual-process models (e.g., Petty & Cacioppo, 1981; Chaiken, 1987) and represents a piece of conceptual and empirical analysis supporting the use of visual stimuli as heuristics in effortless routes of processing information. In fact, this research offers insight on how *au naturel* colors in food packaging, by working as a mental shortcut to simplify evaluation, influences consumer willingness to pay. Consistent with dual process theories, this research identifies a moderator of the effect of *au naturel* colors, by proposing and demonstrating that the perceived healthiness of the food category determines a boundary condition of the positive effect of *au naturel*-colored packaging on consumer willingness to pay, the latter holding only for healthy food categories. For potentially dangerous food products the effect disappears due to the activation of a central route of elaboration and the dismissal of the *au naturel* colors heuristic. The proposed conceptualization and reported findings, therefore, offer further support to dual process theories in the study of the effects of food packaging cues.

Managerial Implications

The findings of this research have implications for firms and policy makers. Color is a design element that must be carefully considered in packaging design, since it represents an environmental prime providing automatic guidance in supermarkets (Dijksterhuis et al., 2005) without requiring explicit instructions to consumers (Hofmann, Deutsch, Lancaster, & Banaji, 2010) or extensive information processing (Trudel & Murray, 2013). The understanding of the associations between color and meanings can help choosing the right color for communicating a specific brand identity and positioning. Therefore, understanding how consumers perceive food products with *au naturel*-colored packaging is strategically important for packaging designers and managers, as well as for policy makers motivated to avoid consumer confusion and deception.

From a firm perspective, the use of *au naturel*-colored packaging on healthy food categories induces higher willingness to pay. Thus, packaging designers may consider *au naturel* color as a viable and preferable alternative when designing packaging for healthy food items. Moreover, firms may use *au naturel* colors to differentiate their offering from competitors, taking advantage of *au naturel* color semantic characterization (Labrecque & Milne, 2013). First, considering that consumers derive higher product authenticity from *au naturel*-colored packaging, firms may use the *au naturel* colors system to position their products around the concept of authenticity, thus evoking perceptions consistent with the intended image. Second, firms involved in the development and management of brand architecture may exploit the association between *au naturel* colors and perceptions of product authenticity to create premium brands featuring *au naturel* colors on packaging of new food categories aimed to be perceived as genuine, true, or organic. Third, firms may add product lines featuring *au naturel*-colored packaging to existing healthy food categories with the aim of expanding variety by adding options perceived as genuine by consumers. By creating

packaging using *au naturel* colors that evokes perceptions of product authenticity in a visually recognizable way, managers and designers may positively influence consumer willingness to pay for healthy food products.

From a policy perspective, the reported findings prompt specific attention to the potential deceptive use of *au naturel* colors on food packaging. Based on the documented evidence on the higher consumer willingness to pay for *au naturel*-colored food packaging, policy makers may need to regulate the use of colors on food packaging from a consumer protection perspective. This research suggests that consumers use *au naturel* colors as a heuristic to simplify information processing during the shopping experience. Consumers associate *au naturel*-colored packaging with product characteristics, thus projecting color-based associations to the product. Therefore, when exposed to *au naturel*-colored packaging, consumers would expect the food products to be genuine and authentic. To reduce consumer confusion and prevent potential deception, policy makers may recommend caution in the use of *au naturel* colors for food products the genuineness of which has not been ascertained.

Limitations and Directions for Future Research

As any other research, this is not immune from limitations, which can stimulate further investigation on the effects of *au naturel* colors. First, this research has focused on the effect of *au naturel* colors in the food packaging context. Although the presented studies featured different food categories (rice, butter, carrots, flour, dark chocolate) and different colors (*au naturel*, red, orange, blue, green, purple), future research may empirically test the robustness of the *au naturel* colors effect for other product categories, either food or non-food. Second, this research reports evidence of the effect of *au naturel* colors only in the food packaging context. The proposed conceptualization of the *au naturel* colors effect could be also extended to other marketing stimuli such as logos, texts, and in store visual merchandising.

Third, beyond the moderating role of product category, future research may investigate other relevant moderators of the *au naturel* colors effect. One might consider how situational cognitive load, or consumer characteristics and personality traits (e.g., need for cognition, health consciousness, attitudes towards the environment) may influence this relationship. Fourth, future studies may want to examine the effect of *au naturel*-colored packaging in conjunction with smaller and differently-colored signs communicating different tastes of the same food product (e.g., yogurt, tea, juices). To ensure maximal internal validity, the presented studies used minimal packages with a single dominant color. It could be interesting to assess if the documented effects hold for packages featuring also other colors, which are often adopted to communicate flavors (e.g., pink for strawberry, yellow for lemon). Fifth, findings of this research are based on the measurement of WTP through self-reported items, in controlled experiments. Future research is needed to generalize the presented results using field experiments and real-world data. Finally, to ensure experimental control, only packaging colors were manipulated, keeping any other visual element neutral. Future research may explore how *au naturel* colors interact with textual claims, iconic systems and other visual cues.

In spite of these limitations, this research aims to provide knowledge and to stimulate further investigation on a color family, *au naturel* hues, which marketers and consumers associate with increasing intensity to concepts such as authenticity and genuineness that are critical for food marketing and consumption.

References

Anderson, C., Hildreth, J. A. D., & Howland, L. (2015). Is the desire for status a fundamental human motive? A review of the empirical literature. *Psychological Bulletin*, 141, 574-601. doi:10.1037/a0038781

Ares, G., & Deliza, R. (2010). Studying the influence of package shape and colour on consumer expectations of milk desserts using word association and conjoint analysis. *Food Quality and Preference*, 21, 930-937. doi:10.1016/j.foodqual.2010.03.006

Bagchi, R., & Cheema, A. (2013). The Effect of Red Background Color on Willingness-to-Pay: The Moderating Role of Selling Mechanism. *Journal of Consumer Research*, 39, 944-960. doi: 10.1086/666466

Bellizzi, J. a., & Hite, R. E. (1992). Environmental color, consumer feelings, and purchase likelihood. *Psychology and Marketing,* 9, 347–363. doi.org/10.1002/mar.4220090502

Bernal Jurado, E., Mozas Moral, A., Fernández Uclés, D., & Medina Viruel, M. J. (2017). Explanatory factors for efficiency in the use of social networking sites—The case of organic food products. *Psychology & Marketing*, 34(12), 1119-1126. doi:10.1002/mar.21052

Berry, C., Burton, S., & Howlett, E. (2017). It's only natural: the mediating impact of consumers' attribute inferences on the relationships between product claims, perceived product healthfulness, and purchase intentions. *Journal of the Academy of Marketing Science,* 45, 698–719. doi: 10.1007/s11747-016-0511-8

Bloch, P.H., Brunel, F.F., & Arnold, T.J. (2003). Individual differences in the centrality of visual product aesthetics: concepts and measurement. *Journal of Consumer Research*, 29, 551–65. doi:10.1086/346250

Beverland, M. B., & Farrelly, F. J. (2009). The quest for authenticity in consumption: Consumers' purposive choice of authentic cues to shape experienced outcomes. *Journal of Consumer Research*, 36(5), 838-856. doi: 10.1086/615047

Celsi, R.L, & Olson, J.C. (1988). The Role of Involvement in Attention and Comprehension Processes, *Journal of Consumer Research*,15(2), 210–224. doi.org/10.1086/209158

Chaiken, S. (1987). The heuristic model of persuasion. In M. P. Zanna, J. M. Olson, & C. P. Herman (Eds), *Social Influence: The Ontario Symposium* (pp. 3-39). Hillsdale, NJ: Erlbaum.

Chandon, P. (2013). How Package Design and Packaged-based Marketing Claims Lead to Overeating. *Applied Economic Perspectives and Policy*, 35, 7–31. doi:10.1093/aepp/pps028

Chebat, J.C., & Morrin, M. (2007). Colors and cultures: Exploring the effects of mall dècor on consumer perceptions. *Journal of Business Research*, 60, 189–196. doi:10.1016/j.jbusres.2006.11.003

Chen, S., & Chaiken, S.S. (1999). Motivated Heuristic and Systematic Processing. *Psychological Inquiry,* 10, 44-49. doi: 10.1207/s15327965pli1001_6

Clarke, T., & Costall, A. (2008). The emotional connotations of color: A qualitative investigation. *Color Research & Application*, 33, 406–410. doi:10.1002/col.20435

Delaby, V., Balikdjian, A., & Pohl, S. (2011). *The Impact of the General Consumption Products Packaging Colour on Consumer Perception*. Exeter, UK: Lea, David Crelley, David Modic, Alex Butler and David Gordon. (Washington singer Press).

Deval, H., Mantel, S. P., Kardes, F. R., & Posavac, S. S. (2013). How Naïve Theories Drive Opposing Inferences from the Same Information. *Journal of Consumer Research,* 39, 1185–201. doi:10.1086/668086

Dijksterhuis, A., Smith, P. K., Rick B. Van Baaren, R. B., & Wigboldus, D. H. J. (2005). The Unconscious Consumer: Effects of Environment on Consumer Behavior. *Journal of Consumer Psychology*, 15, 193–202. doi:10.1207/s15327663jcp1503_3

Drèze, X., & Nunes, J. C. (2009). Feeling Superior: the impact of loyalty program structure on consumers' perceptions of status. *Journal of Consumer Research*, 35, 890–905. doi:10.1086/593946

Elliot, A.J., & Maier, M. (2007). Color and psychological functioning. *Current Directions in Psychological Science*, 16, 250–254. doi:10.1111/j.1467-8721.2007.00514.x

Elliot, A. J., Maier, M. A., Moller, A. C., Friedman, R., & Meinhardt, J. (2007). Color and psychological functioning: the effect of red on performance attainment. *Journal of Experimental Psychology: General*, 136, 154–168. doi:10.1037/0096-3445.136.1.154

Evans, G., de Challemaison, B., & Cox, D. N. (2010). Consumers' ratings of the natural and unnatural qualities of foods. *Appetite*, 54, 557–563. doi:10.1016/j.appet.2010.02.014

Ewing, D. R., Allen, C. T., & Ewing, R. L. (2012). Authenticity as meaning validation: An empirical investigation of iconic and indexical cues in a context of "green" products. *Journal of Consumer Behaviour*, 11(5), 381-390. doi: 10.1002/cb.1382

Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.

Frank, M.G., & Gilovich, T. (1988). The Dark Side of Self- and Social Perception: Black Uniforms and Aggression in Professional Sports. *Journal of Personality and Social Psychology*, 54, 74-85. doi:10.1037/0022-3514.54.1.74

Fraser, T., & Banks, A. (2004). *Designer's color manual: The complete guide to color theory and application.* San Francisco: Chronicle Books.

Fuchs, C., Schreier, M., & Van Osselaer, S. M. (2015). The handmade effect: What's love got to do with it? *Journal of Marketing*, 79(2), 98-110. doi: 10.1509/jm.14.0018

Funk, D., & Ndubisi, N.O. (2006). Colour and product choice: a study of gender roles. *Management Research News*, 29, 41-52. doi:10.1108/01409170610645439

Garber Jr, L.L., Burke, R., & Jones, J.M. (2000). The role of package color in consumer purchase consideration and choice. Working Paper No. 00-104, Marketing Science Institute, Cambridge, MA.

Gorn, G.J., Chattopadhyay, A., Yi, T., & Dahl, D.W. (1997). Effects of Color as an Executional Cue in Advertising: They're in the Shade. *Management Science,* 43, 1387–1400. doi:10.1287/mnsc.43.10.1387

Grayson, K., & Martinec, R. (2004). Consumer perceptions of iconicity and indexicality and their influence on assessments of authentic market offerings. *Journal of Consumer Research*, 31(2), 296-312. doi: 10.1086/422109

Heider, F. (1958). *The Psychology of Interpersonal Relations*. John Wiley & Sons.

Hofmann, W., Deutsch, R., Lancaster, K., & Banaji, M. R. (2010). Cooling the Heat of Temptation: Mental Self-Control and the Automatic Evaluation of Tempting Stimuli. *European Journal of Social Psychology*, 40, 17– 25. doi:10.1002/ejsp.708

Huang, L., & Lu, J. (2015). Eat with your eyes: package color influences the expectation of food taste and healthiness moderated by external eating. *The Marketing Management Journal*, 25, 71–87.

Hussain, S., Ali, S., Ibrahim, M., Noreen, A., & Ahmad, S.F. (2015). Impact of Product Packaging on Consumer Perception and Purchase Intention. *Journal of Marketing and Consumer Research,*10, 1-9.

Kahneman, D., & Frederick, S. (2005). A model of heuristic judgment. In K. J. Holyoak, and R. G. Morrison (Eds.). *The Cambridge handbook of thinking and reasoning* (pp. 267–293). Cambridge: Cambridge University Press.

Kaltcheva, V.D., & Weitz, B. (2006). When Should a Retailer Create an Exciting Store Environment? *Journal of Marketing*, 70, 107–18. doi:10.1509/jmkg.2006.70.1.107

Kapferer, J.-N., & Laurent, G. (1993). Further evidence on the consumer involvement profile: Five antecedents of involvement. *Psychology and Marketing,*10, 347-355. doi:10.1002/mar.4220100408.

Karnal, N., Machiels, C. J. A., Orth, U. R., & Mai, R. (2016). Healthy by design, but only when in focus: Communicating non-verbal health cues through symbolic meaning in packaging, *Food Quality and Preference*, 52, 106-119. doi:10.1016/j.foodqual.2016.04.004.

Klerck, D., & Sweeney, J. C. (2007). The effect of knowledge types on consumer-perceived risk and adoption of genetically modified foods, *Psychology and Marketing*, 24(2), 171-193. doi: 10.1002/mar.20157

Labrecque, L.I., & Milne, G.R. (2012). Exciting red and competent blue: The importance of color in marketing. *Journal of the Academy of Marketing Science*, 40, 711–727. doi:10.1007/s11747-010-0245-y

Labrecque, L.I., & Milne, G.R. (2013). To be or not to be different: Exploration of norms and benefits of color differentiation in the marketplace. *Marketing Letter*s, 24, 165–176. doi.org/10.1007/s11002-012-9210-5

Labrecque, L. I., Patrick, V. M., & Milne, G. R. (2013). The marketers' prismatic palette: A review of color research and future directions. *Psychology and Marketing*, 30, 187–202. doi: 10.1002/mar.20597

Laurent, G., & Kapferer, J.-N. (1985). Measuring Consumer Involvement Profiles. *Journal of Marketing Research*, 22(1), 41–53. doi.org/10.1177/002224378502200104

Lee, N.Y., Noble, S.M., & Biswas, D. (2016). Hey big spender! A golden (color) atmospheric effect on tipping behavior. *Journal of the Academy of Marketing Science,* 1-21. doi:10.1007/s11747-016-0508-3

Levy, B. I. (1984). Research into the psychological meaning of color. *American Journal of Art Therapy,* 23, 58-62.

Mahnke F.H. (1996). *Color, Environment, & Human Response*. New York: Reinhold.

Mai, R., Symmank, C., & Seeberg-Elverfeldt, B. (2016). Light and Pale Colors in Food Packaging: When Does This Package Cue Signal Superior Healthiness or Inferior Tastiness? *Journal of Retailing,* 92, 426-444. doi:10.1016/j.jretai.2016.08.002

Mead, J.A., & Richerson, R. (2018). Package color saturation and food healthfulness perceptions. *Journal of Business Research,* 82, 10–18. doi:10.1016/j.jbusres.2017.08.015

Meyers-Levy, J., & Peracchio, L. (1995). Understanding the Effects of Color: How the Correspondence between Available and Required Resources Affects Attitudes. *Journal of Consumer Research*, 22, 121-138. doi:10.1086/209440

Moulard, J. G., Raggio, R. D., & Folse, J. A. G. (2016). Brand authenticity: Testing the antecedents and outcomes of brand management's passion for its products. *Psychology & Marketing*, 33(6), 421-436. doi: 10.1002/mar.20888

Murray, D. C., & Deabler, H. L. (1957). Colors and mood-tones. *Journal of Applied Psychology*, 41, 179–283. doi:10.1037/h0041425

Newman, C. L., Burton, S., Andrews, J.C., Netemeyer, R. G., & Kees, J. (2018). Marketers' use of alternative front-of-package nutrition symbols: An examination of effects on product evaluations. *Journal of the Academy Marketing Science*, 46, 453–476. doi:10.1007/s11747-017-0568-z

Nuttavuthisit, K., & Thøgersen, J. (2017). The importance of consumer trust for the emergence of a market for green products: The case of organic food. *Journal of Business Ethics*, 140(2), 323-337. doi: 10.1007/s10551-015-2690-5

Petty, R. E., & Cacioppo, J. T. (1981). *Attitudes and Persuasion: Classic and Contemporary Approaches.* Dubuque, IA: Wm. C. Brown.

Petty, R. E., Cacioppo, J.T., & Schumann, D. (1983). Central and Peripheral Routes to Advertising Effectiveness: The Moderating Role of Involvement. *Journal of Consumer Research*, 10(2),135–146. doi.org/10.1086/208954

Puccinelli N.M., Chandrasekaran R., Grewal D., & Suri R. (2013). Are men seduced by red? The effect of red versus black prices on price perception, *Journal of Retailing*, 89, 115–125. doi:10.1016/j.jretai.2013.01.002

Rodgers, W.C., & Schneider, K.C. (1993). An empirical evaluation of the Kapferer-Laurent consumer involvement profile scale, *Psychology and Marketing*, 10, 333-345. doi:10.1002/mar.4220100407

Roullet, B., & Droulers, O. (2005). Pharmaceutical packaging color and drug expectancy. In *Advances in Consumer Research*, 32, 164–171.

Sidali, L. K., & Hemmerling, S. (2014). Developing an authenticity model of traditional food specialties: Does the self-concept of consumers matter? *British Food Journal*, 116(11), 1692-1709. doi: 10.1108/BFJ-02-2014-0056

Sirdeshmukh, D., Singh, J., & Sabol, B. (2002). Consumer trust, value, and loyalty in relational exchanges. *Journal of Marketing*, 66(1), 15-37. doi: 10.1509/jmkg.66.1.15.18449

Skorinko, J.L., Kemmer, S., Hebl, M.R., & Lane, D.M. (2006). A Rose by Any Other Name: Color-Naming Influences on Decision Making. *Psychology & Marketing,* 23, 975–99. doi.org/10.1002/mar.20142

Soldat, A.S., Sinclair, R.C., & Mark, M.M. (1997). Color as an Environmental Processing Cue: External Affective Cues Can Directly Affect Processing Strategy Without Affecting Mood. *Social Cognition*, 15, 55-71. doi:10.1521/soco.1997.15.1.55

Stafford, T., & Grimes, A. (2012). Memory enhances the mere exposure effect. *Psychology and Marketing*, 29, 995–1003. doi:10.1002/mar.20581

Sunaga, T., Park, J., & Spence, C. (2016). Effects of Lightness-Location Congruency on Consumers' Purchase Decision-Making, *Psychology and Marketing*, 33, 934–950. doi.org/10.1002/mar.20929

Trudel, R., & Murray, K. B. (2013). Self-Regulatory Strength Amplification Through Selective Information Processing. *Journal of Consumer Psychology*, 23, 61–73. doi:10.1016/j.jcps.2012.02.002

Vega Zamora, M., Torres Ruiz, F. J., Murgado Armenteros, E. M., & Parras Rosa, M. (2014). Organic as a heuristic cue: What Spanish consumers mean by organic foods. *Psychology & Marketing*, 31(5), 349-359. doi:10.1002/mar.20699

Yang, S. & Raghubir, P. (2005). Can Bottles Speak Volumes? The Effect of Package Shape on How Much to Buy. *Journal of Retailing*, 81, 269–81. doi:10.1016/j.jretai.2004.11.003

Wexner, L. B. (1954). The degree to which colors are associated with mood-tones. *Journal of Applied Psychology*, 6, 432-435. doi:10.1037/h0062181

Tables

Table 1 ANCS measures

Item *To what extent do you think the colors of this packaging...*	Study 1A *EFA Factor Loadings*	Study 1B *CFA Standardized Coefficients*
... are *au naturel* colors?	.84	.89
... bring to mind something that is <u>organic</u> (i.e., without chemical additives)?	.82	.87
… are <u>neutral</u> colors?	.79	.75
… bring to mind something that <u>comes from the soil</u>?	.77	.82
... are <u>not artificial</u> colors?	.92	.85
... are <u>untreated</u> colors?	.92	.87
... express <u>authenticity</u> (i.e., something that is genuine)?	.77	.69

Figures legends

Figure 1. Hues of *au naturel* colors (with values of RGB color model)

Figure 2. Design and stimuli used in the experimental studies

Figure 3. Willingness to pay as a function of packaging color and product category (Study 2)

Note: Error bars = ± 1SE

Figure 4. Willingness to pay as a function of packaging color and product color (Study 3)

Note: Error bars = ± 1SE

Figure 5. Willingness to pay as a function of packaging color and color lightness (Study 4)

Note: Error bars = ± 1SE

Figure 6. The effect of packaging color (*au naturel vs. non au naturel*) on willingness to pay through product authenticity (Study 4)

Figure 1. Hues of *au naturel* colors (with values of RGB color model)
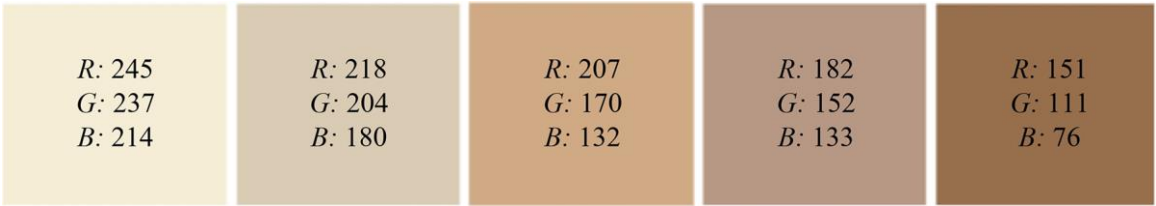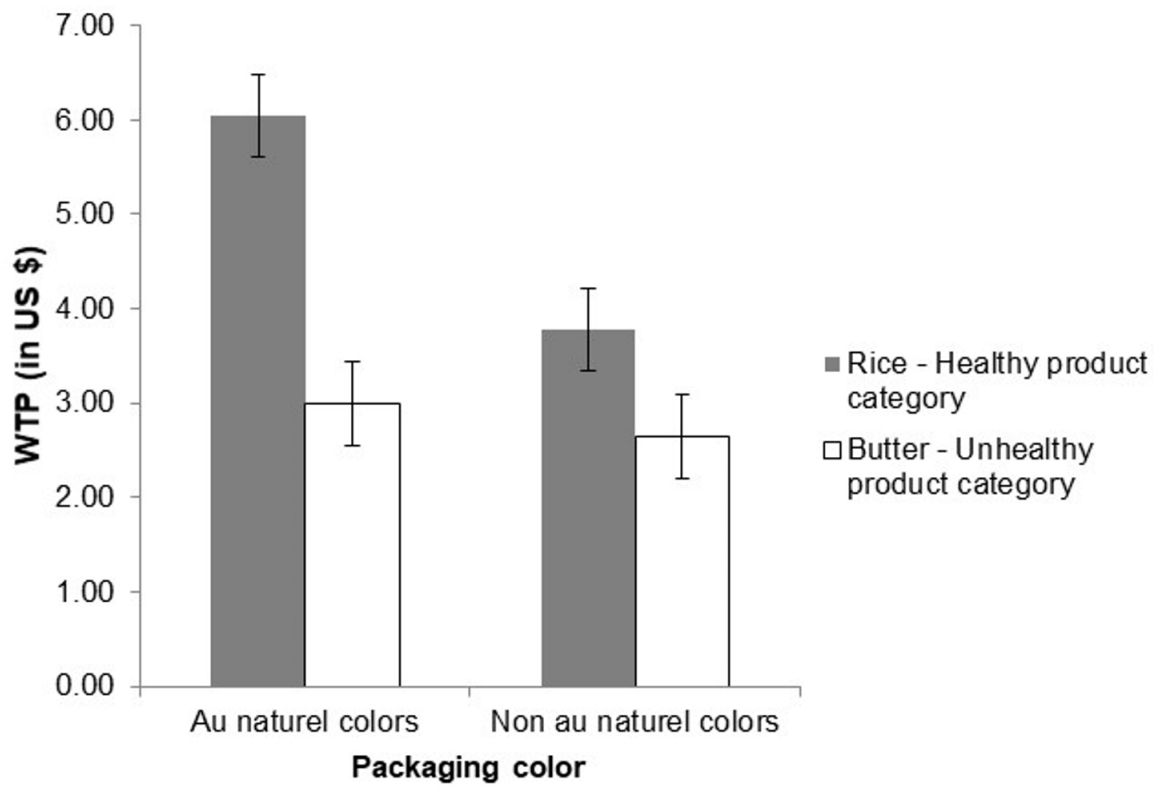
R: 245 G: 237 B: 214	R: 218 G: 204 B: 180	R: 207 G: 170 B: 132	R: 182 G: 152 B: 133	R: 151 G: 111 B: 76

Figure 2. Design and stimuli used in the experimental studies

			Product category		Representative RGB values
			Healthy (rice)	Unhealthy (butter)	
Study 2	Packaging color	*Au naturel*			R: 207 G: 170 B: 132
		Non au naturel			R: 240 G: 90 B: 110

			Product color		
			Au naturel (rice)	*Non au naturel (carrots)*	
Study 3	Packaging color	*Au naturel*			R: 207 G: 170 B: 132
		Non au naturel			R: 252 G: 165 B: 58

			Color lightness		
			Light	*Dark*	
Study 4	Packaging color	*Au naturel*			Light: R: 206 G: 171 B: 133 — Dark: R: 114 G: 87 B: 66
		Non au naturel			Light: R: 128 G: 197 B: 204 — Dark: R: 60 G: 101 B: 107

Study 5a	Packaging color	*Au naturel*		**Study 5b**	Packaging color	*Au naturel*		R: 207 G: 173 B: 134
		Non au naturel				*Non au naturel*		Green: R: 133 G: 209 B: 135 — Purple: R: 183 G: 111 B: 159

Figure 3. Willingness to pay as a function of packaging color and product category (Study 2)
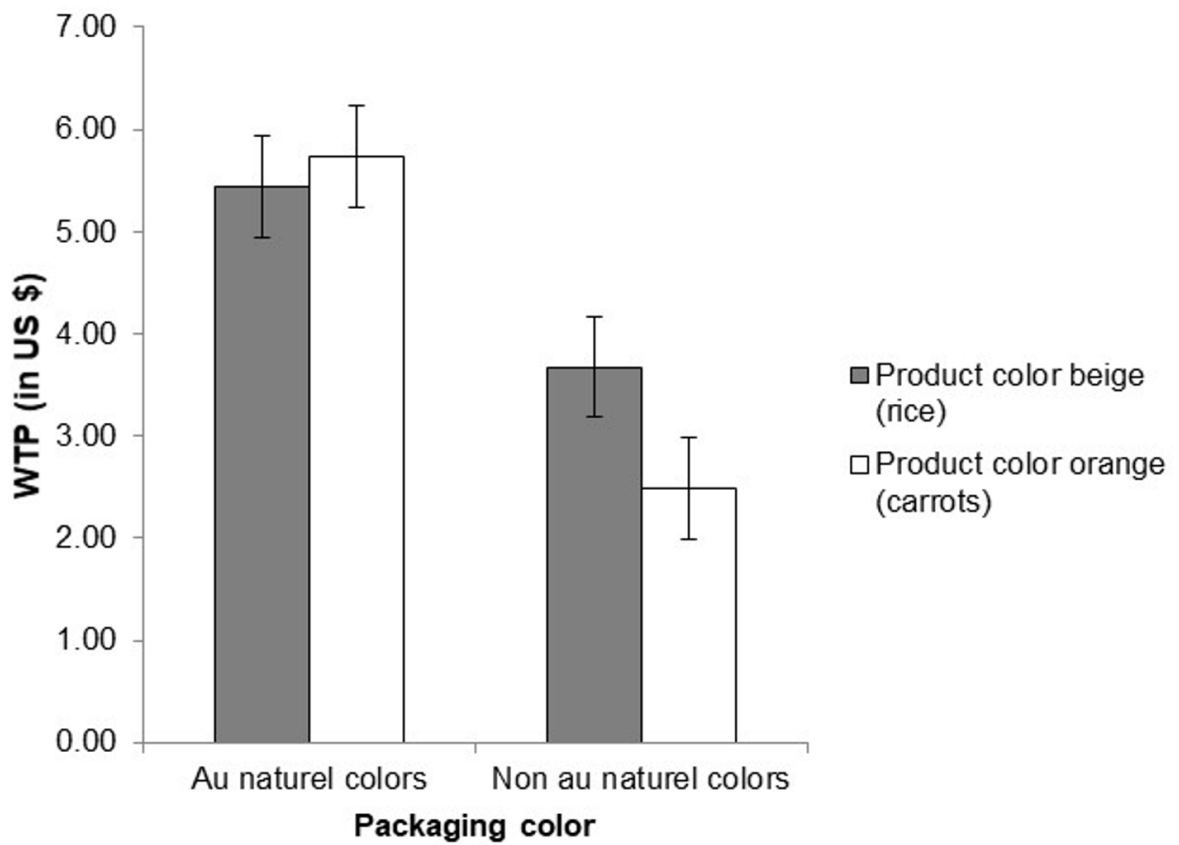
Note: Error bars = ± 1SE

Note: Error bars = ± 1SE

Figure 4. Willingness to pay as a function of packaging color and product color (Study 3)
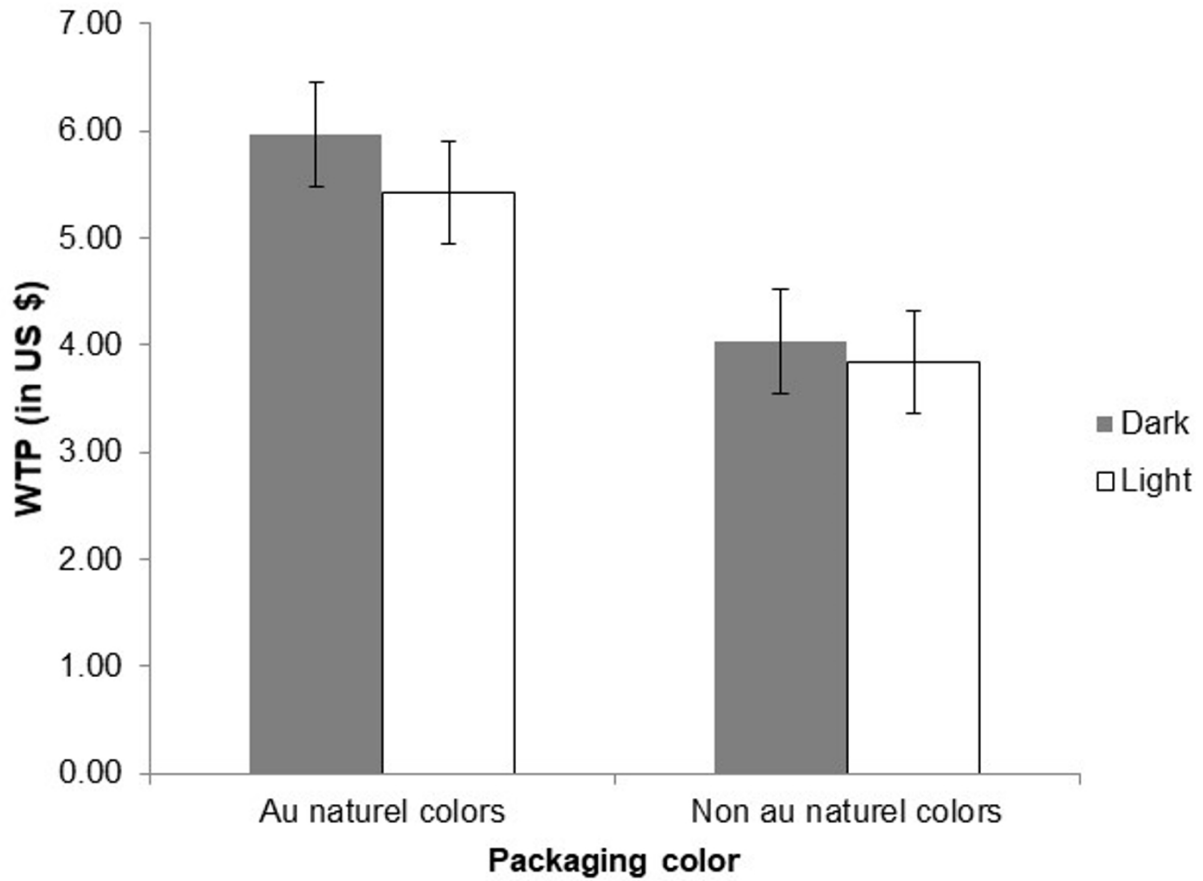
Note: Error bars = ± 1SE
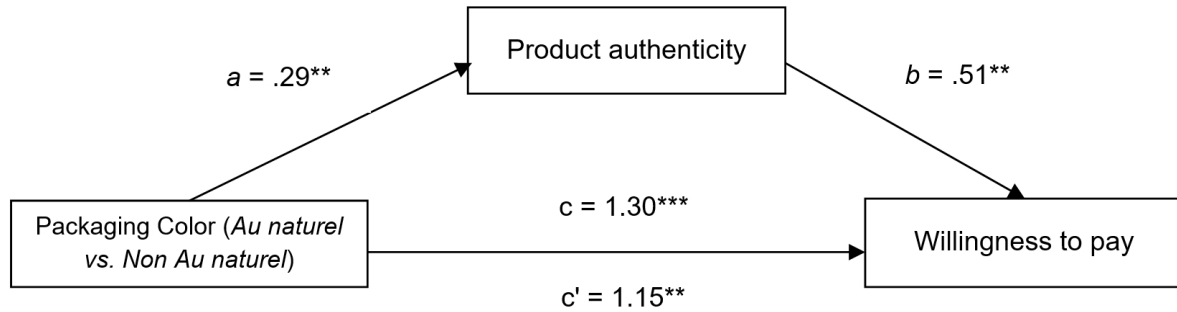

Note: Error bars = ± 1SE

Figure 5. Willingness to pay as a function of packaging color and color lightness (Study 4)

Note: Error bars = ± 1SE

Note: Error bars = ± 1SE

Figure 6. The effect of packaging color (*au naturel vs. non au naturel*) on willingness to pay

through product authenticity (Study 4)

Indirect effect = .15, Bootstrap 95% CI = [.02, .41], *** *p* < .01, ** *p* < .05

[1] https://kafoodle.com/blog/4-major-food-packaging-design-trends-cant-ignore/

[2] For examples of packaging featuring this family of colors see https://www.mr-organic.com/food/beans-pulses; https://www.alcenero.com/en/products/category/biscuits-3/; https://www.prozis.com/uk/en/category/food/organic.

[3] See https://www.merriam-webster.com/dictionary/au%20naturel.

[4] Subsequent studies pursued, among others, the goal of obtaining additional evidence in support of the research hypotheses controlling for differences in saturation and brightness between color conditions.