Sensory Marketing: Which Flavor Do You See?

Cross-Modal Correspondences between Label Color, Bottle-Opening Sound, and Flavor

Expectation of Red Wine and its Effect on Consumers' Online Purchase intention

Nynke Reitsma

ANR: u202555

SNR: 2066268

Master Thesis

Communication and Information Sciences

Business Communication and Digital Media

Tilburg School of Humanities and Digital Sciences

Tilburg University, Tilburg

Supervisor: Dr. T. Lentz

Second reader: Dr. E. Abrahamse

January 31, 2023

Abstract

When a sensory stimulus is given to one sense, it can lead to an expectation in another sense. Knowledge about cross-modal correspondences allows marketers to create a desired effect that positively influences the customer experience. This current study investigates how cross-modal correspondences between label color (congruency), bottle-opening sound (congruency), and wine flavors affect consumers' specific flavor expectations and online purchase intention of bottles of red wine. To investigate this an online experiment is conducted (n = 198) with a 4 x 2 mixed design (within participants: Label color x between participants: Bottle-opening sound). Five hypotheses were tested by performing PROCESS-model 7 of Hayes (2022). The analysis has been run five times (once for each flavor with color- and sound congruency already identified in the literature). This study found significant evidence of label color on purchase intent, label color congruency on flavor expectation, and for some flavors (sweet and dry) an effect of sound on flavor expectation. Despite these findings, the effect of color on purchase intent cannot be explained with an effect of color congruency on flavor expectation that leads to purchase intent. This study found no significant evidence of moderated mediation for any flavor but there is a small correlation between flavor expectation on purchase intent. The results of this current study are partly in line with earlier scientific research about sensory marketing and cross-modal correspondences, but further research on moderated mediation between colors, sounds, flavors, and purchase intent is needed.

Keywords: Sensory marketing, cross-modal correspondences, purchase intention, sound, color, flavor, flavor expectation

Table of contents

Sensory Marketing: Which Flavor Do You See?

There is increasing knowledge about cross-model correspondences, which allows marketers to create a desired effect that positively influences the customer experience. Cross-model correspondences are nonarbitrary associations that exist between different senses (Spence, 2011). Much previous research shows that senses are related (Garber et al., 2015; Lick et al., 2017; Reynolds et al., 2018; Simner et al., 2010; Spence & Wang, 2017). When a sensory stimulus is given to one sense, it can lead to an expectation in another sense (Spence, 2011). As consumers, we unconsciously let ourselves be guided through our senses. In marketing, consumers' senses are often manipulated with developing advertisements or designing product packaging. Factors such as colors, fonts, and sounds can affect the customers' experience. This manipulation of senses is called sensory marketing (Krishna, 2012).

The evolution of online sensory marketing is moving fast (Petit et al., 2019), but little research has been done on whether the online environment affects the expectation of flavor. However, Harun et al. (2020) found that taste perception based on digital images differs from the actual taste of the depicted product. It is more difficult to create a good perception through a digital image, so marketers need to be able to trigger the right senses of the consumer that lead to the desired online perception (Hsin Chang & Wang, 2011).

The increased ease of online sales channels leads to more retailers selling their products online which ensures consumers can easily switch to competitors (Bonn et al., 2015). There are several ways to keep consumers loyal to a company, such as creating the right taste expectation that matches the experience. The increased ease of online sales channels also influences the online wine market, of which revenues are growing by 30% annually (Bonn et al., 2015). To maintain the consumers' attention online, sensory marketing can be deployed (Petit et al., 2019).

Previous research on cross-modal correspondences shows that color and sound can evoke specific expectations (Hamilton-Fletcher et al., 2016). For example, the color of a wine label and the bottle-opening sound both affect expectations related to the taste of wine (Lick et al., 2017; Spence & Wang, 2017). Since there has been previous research on cross-modal correspondences related to wine packaging (Lick et al., 2017; Spence & Wang, 2017), wine is a good topic for further research on cross-modal correspondences and its influence on marketing in general.

Lick et al. (2017) found that consumers in a shopping mall based their expectations of the taste of red wine on the color of the wine label. For instance, the colors red and black were associated with a spicy taste and the orange color with a sweeter taste. However, their study was done among consumers in a real-life shopping mall and no comparison had been made with online differences in flavor expectations. The same applies to Garber et al. (2015). They also found a relationship between the colors of beverage labels and expectations of specific flavors in an offline environment.

Another effect on the consumers' perception of wine is the bottle closure type. Research shows that wine from a bottle with a cork is rated better for quality of taste compared to wine sealed with a screw or synthetic cork (Reynolds et al., 2018). In the study by Lick et al. (2017), all bottles in the study had a cork. Therefore, the effect of bottle closure type was not measured in their study. Spence and Wang (2017) show that the expectation based on the bottle closure type is partly due to the sound that opening the bottle produces. People have specific beliefs about the quality of taste of wine with different closure types. When people hear the sound of opening a bottle with a cork, the quality of the wine is rated higher (Spence & Wang, 2017).

In conclusion, there is evidence that the bottle-opening sound affects the perception of the quality of taste, which is investigated by Reynolds et al. (2018). According to Dippong

and Mihali (2019) and Sáenz-Navajas et al. (2015), there are flavors associated with high-quality wine (e.g., woody, dry, and spicy) and flavors associated with low-quality wine (e.g., fruity and sweet). There is also a relationship between label colors and flavor expectation (Lick et al., 2017) and there are cross-modal correspondences between sound and flavor (Hamilton-Fletcher et al., 2016). It could be that the bottle-opening sound influences the effect of label colors on the expectation of a specific flavor because of the quality expectation based on the sound compared to the quality association of the specific flavor.

To explore how cross-modal correspondences between label color and flavor influence the flavor expectation of specific flavors and how these correspondences are influenced by the bottle opening sound, this current study uses color-flavor associations already identified in the literature, as well as color-quality and sound-quality associations already identified in the literature (Dippong & Mihali, 2019; Lick et al., 2017; Sáenz-Navajas et al., 2015). Subsequently, we will examine the effect of associations between color, flavor(-quality), and sound-quality on purchase intention.

The results of this current study may be relevant to marketing and cognition because of its contribution to a better understanding of the complex interaction that might exist between color, sound, and flavor expectations. Ultimately, the results can be placed in a broader perspective and can be used for cognition and communication purposes in general. Red wine is a good topic to explore cross-modal correspondences since wine is a product that is produced and interpreted in different ways (Lick et al., 2017), which allows marketers to approach consumers with different sensory modes when promoting and selling the product.

Based on the study outcomes, wine retailers might be able to design the labels and bottle closures of their online wine products according to the specific flavor expectations they would like their consumers to have. Wine bottles designed for the relevant flavor may lead to higher purchase intention and customer satisfaction because the real experience matches the

flavor expectation created by the consumer online. Therefore, this current study investigates the following research question:

RQ: How do cross-modal correspondences between label colors, bottle-opening sounds, and wine flavors affect the consumers' flavor expectation and online purchase intention of bottles of red wine?

Theoretical framework

According to Erenkol (2015), seducing consumers by using senses to influence their feelings and/or behavior is sensory marketing. In this process, stimuli manipulate one or more of the five senses (sight, hearing, smell, taste, and touch senses). Sensory stimulation can influence the consumer perception of a product and purchase intention (Erenkol, 2015). There is a large body of research that shows that there are cross-modal correspondences between senses that amplify the effects of sensory marketing (Lick et al., 2017; Spence et al., 2010, 2015; Wan et al., 2014; Woods & Spence, 2016).

Cross-modal correspondence is an aspect of sensory marketing that describes nonarbitrary associations that exist between different senses. Different senses (e.g., color and taste) can sometimes show a specific effect of cross-modal correspondences (Spence, 2011). Previously, designers used corresponding colors and flavors as a creative exercise to gain inspiration for food packaging (Spence et al., 2015). Later, designs were based on scientific research about flavor and color (Spence et al., 2015). Even though taste perceptions change over time and there is no specific reason why people connect senses, there still appears a high degree of consistency between color and taste (Spence & Levitan, 2021).

In addition to color and taste, there are also cross-modal correspondences between other senses. Hagtvedt and Brasel (2016) show cross-modal correspondences between color and sound. The ability to combine color and sound correctly is becoming increasingly important in marketing to gain attention from visual audiences. The reason that the ability to

correctly combine senses is becoming increasingly important is that multitasking in media dominates consumer behavior, resulting in increasingly lower visual attention (Hagtvedt & Brasel, 2016).

In addition to the above-discussed types of cross-modal correspondences, more senses correspond to each other in a particular way such as, for example, smell and taste (Spence & Levitan, 2021), sound and taste (Simner et al., 2010), and sound and feeling (Imschloss & Kuehnl, 2019). This current study focuses on color, sound, and flavor expectations (the expectation of specific flavors) and the cross-modal correspondences in an online environment.

Online sensory marketing

Customer experience is different during the online purchase process than during offline purchases. Studies that investigate differences between online and offline shopping show that the shopping environment helps to affect the customer's experience (Falode et al., 2016; Hult et al., 2019; Wong et al., 2018), especially the quality and value of a product (Hult et al., 2019).

Several studies investigated taste expectations of wine and other products in general (Arboleda et al., 2021; Lick et al., 2017; Vázquez et al., 2009). However, these studies are based on offline expectations. Hsin Chang and Wang (2011) state that an online shopping environment affects customer perception toward the product because it is more difficult to create a good perception through a digital image. Because an online environment influences customer perception and experience, it is important to know how to successfully influence the customer in an online shopping environment (Petit et al., 2019).

Generally, sensory interaction in online sales remains with visual images, but there is increasing use of sensory approaches in online shopping environments such as background music in an online shop; also touch screens stimulate the senses (Petit et al., 2019).

According to Petit et al. (2019), it becomes a challenge for marketers and researchers to find the right balance of sensory marketing that can stimulate both offline and online.

It is easier for consumers to compare products in an online shopping environment than in an offline one. Online, customers can switch to a competitor more easily. Because customers can easily switch to a competitor online, it is harder for online retailers to retain customers than in an offline store. Therefore, it is important to make online products match the customers' expectations by examining carefully what attracts customers to a product online (Hsin Chang & Wang, 2011).

Cross-modal correspondences: Colors and flavor expectation

Multiple sources are showing that colors correspond to flavors (Baptista et al., 2021; Delgado et al., 2013; Lick et al., 2017; Spence, 2019; Woods & Spence, 2016). However, not all studies show the same results of color-flavor associations. Several studies show that people associate the color red with a sweet flavor (Spence, 2019; Woods & Spence, 2016) but Lick et al. (2017) show that a sweet taste is most expected with the color orange followed by the color red and that the color red evokes more fruity and spicy flavor expectations. While Spence (2019) and Woods and Spence (2016) show that primarily the color red creates a sweet taste expectation and that orange was rarely chosen as a color associated with sweetness (Spence, 2019), the results of Lick et al. (2017) are contradictory.

Lick et al. (2017) found that labels with black color are in general more often associated with flavors than other colors. While orange and red are associated with two flavors and white with just one flavor, the color black is associated with three flavors (woody, dry, and earthy). Another study that has investigated the influence of packaging colors on taste expectations shows kind of similar results (Baptista et al., 2021). Although Baptista et al. (2021) researched chocolate packaging and not wine labels, it is notable that dark colors such as black, are generally associated with more flavors than other colors such as red, pink,

and yellow. Delgado et al. (2013) investigated olive oil packaging. Their study also found
that dark-colored packaging was preferred over light-colored packaging by respondents. For
this reason, it is expected that in this current study, black is also associated with more flavors
than other colors.

Despite some studies showing different results of color-flavor associations (Spence,
2019; Woods & Spence, 2016), Baptista et al. (2021) and Delgado et al. (2013) are consistent
with the results of Lick et al. (2017). The color-flavor associations from Lick et al. (2017) are
used in this current study and are given in Table 1 (scale of 0-10). Table 1 shows the degree
of flavor expectation by label color for eight flavors. We named the color with the highest
ranking on a scale of 1 to 10 congruent to the flavor and the color with the lowest ranking on
a scale of 1 to 10 incongruent to the flavor.

Table 1

Expectations of Red Wine Flavors based on Label Colors (Lick et al., 2017)

Flavor	White label	Red Label	Black Label	Orange label
Dry	4.45	5.21	**6.11 (+)**	**4.44 (-)**
Flowery	4.61	6.00	**3.53 (-)**	**6.44 (+)**
Earthy	**2.99 (-)**	4.91	**+6.59**	4.11
Fruity	**4.50 (-)**	**+7.18**	4.82	6.73
Milky	**4.98 (+)**	**2.59 (-)**	**2.59 (-)**	**2.59 (-)**
Spicy	**3.63 (-)**	**7.25 (+)**	7.15	5.99
Sweet	4.10	4.89	**3.63 (-)**	**5.89 (+)**
Woody	**2.89 (-)**	5.30	**6.90 (+)**	4.05

Note. The numbers in bold are the most congruent **(+)** and less congruent (-) per flavor.

The study by Lick et al. (2017) was conducted in Austria, where the designations of
the flavors in the survey were German. For the research report, these designations were

translated into English. The German word "würzig" was translated to "tangy" by Lick et al. (2017). Lick et al. (2017) describe "tangy" as a flavor that includes sweet spices (vanilla, cloves, and cinnamon) hot spices (black pepper and licorice), and fresh seasoning (lovage and rosemary). Since "spicy" is a better translation for "würzig" (würzig – Wiktionary, n.d.), this current study will use the designation "spicy" instead of "tangy".

Based on the numbers in Table 1 (Lick et al., 2017), we assume that in this current study for each flavor, the congruent color leads to a higher flavor expectation than the incongruent color (e.g., dry flavor: orange label = incongruent vs. black label = congruent). This leads to the following hypothesis:

H1: *Label colors with high congruency to a red wine flavor will lead to a higher flavor expectation for that flavor than label colors with low congruency to that flavor.*

Quality expectations

Several studies show that people have quality expectations with specific wine flavors (Dippong & Mihali, 2019; Sáenz-Navajas et al., 2015). Sáenz-Navajas et al. (2015) show that wines with a woody flavor are seen as high-quality wines, and wines with a cherry/sweet flavor are seen as low-quality wines. Another study about the taste of wines shows that wine with a strong flavor, like a spicy or dry flavor, is also associated with high quality (Dippong & Mihali, 2019).

Based on previous research, the associated perception of quality is formulated for each flavor in Table 2 (Dippong & Mihali, 2019; Sáenz-Navajas et al., 2015). The flavors fruity and sweet are associated with low quality (Sáenz-Navajas et al., 2015), and the flavors spicy, dry, and woody with high quality (Dippong & Mihali, 2019; Sáenz-Navajas et al., 2015). No information on quality perception was found in the existing literature about the remaining flavors flowery, earthy, and milky.

The study by Lick et al. (2017) shows an expectation per color for each flavor. For each flavor, there is one color it is most associated with (congruent) and one color it is least associated with (incongruent). All flavors, quality associations, most congruent colors, and most incongruent colors are shown in Table 2.

Table 2

Color- and Sound Congruency to Flavor and Flavor-Quality Associations (Dippong & Mihali, 2019; Lick et al., 2017; Reynolds et al., 2018; Spence & Wang, 2017; Sáenz-Navajas et al., 2015)

	Flavor	**Congruent color**	**Incongruent color**	**Flavor quality association**	**Congruent bottle closure sound**
1.	Fruity	Red	White	Low	Screw
2.	Sweet	Orange	Black	Low	Screw
3.	Spicy	Red	White	High	Cork
4.	Dry	Black	Orange	High	Cork
5.	Woody	Black	White	High	Cork
6.	Flowery	Orange	Black	No quality association	-
7.	Earthy	Black	White	No quality association	-
8.	Milky	White	Red, black, and orange	No quality association	-

Product sounds

Product sounds are sounds that provide information about how a product works and belong to the experience of a product (Chandran et al., 2014). These sounds contribute positively to a customer's perception of a product. Besides the fact that consumers find visual images important, auditory sounds are also important and product sounds can support visual images. Product sounds consist of two different categories: "Consequential sounds" (e.g.,

opening a bottle) come from the mechanical, electrical, or manual operation of the product, and "intentional sounds" (e.g., the beep of a washing machine) are added to a product on purpose (Chandran et al., 2014).

Simner et al. (2010) found that sound can affect taste perception. Spence and Wang (2017) showed also that the quality expectation based on opening a bottle of wine comes mainly from the bottle-opening sound (consequential sound). While the sound of a cork increases the quality expectation of taste, the sound of a screw reduces the quality expectation of taste (Reynolds et al., 2018). We suspect that flavor expectation will be influenced by the quality expectation based on the bottle-opening sound, because some flavors are also associated with quality.

Certain flavors have a low-quality association and others have a high-quality association (Dippong & Mihali, 2019; Sáenz-Navajas et al., 2015). A cork is congruent to flavors with a high-quality association and a screw is congruent to flavors with a low-quality association. We expect that a congruent bottle-opening sound can increase the flavor expectation. As shown in Table 2, it is expected that the flavor expectation for high-quality flavors will increase with the opening sound with a cork (high-quality sound) and that the flavor expectation for low-quality flavors will increase with the opening sound with a screw (low-quality sound).

The following hypothesis is drawn up:

H2: *A bottle-opening sound that is congruent in quality with a red wine flavor will lead to a higher flavor expectation for that flavor than a bottle-opening sound with low congruency to that flavor.*

Intermodality transductions

Transductions involving modes from different sensory modalities are defined as "intermodality transductions" (Lick, 2022). When designing products or furnishing a store,

specific sensory modes from different sensory modalities are combined. The goal of employing intermodality transductions is to get customers to interpret the crossmodal-correspondences after which customers will display approach behaviors (e.g., buying products). When different sensory modalities are deployed, it is important that they are coherent and consistent. Only in this way the different sensory modalities can reinforce each other and ensure the approach behavior of customers. A sensory modality that distracts the customer (e.g., background noise that does not match) may lead to customer avoidance behavior (Lick, 2022).

Based on the literature on the congruency of color to flavor and quality expectations of flavors and sounds (Dippong & Mihali, 2019; Lick et al., 2017; Reynolds et al., 2018; Spence & Wang, 2017; Sáenz-Navajas et al., 2015), we expect a positive effect of both, congruent label color and congruent bottle-opening sound on flavor expectation. When the theory of intermodality transductions of Lick (2022) is linked to the positive effects of label color and sound on flavor expectation, we can assume that when a label color is combined with the appropriate bottle-opening sound, these different sensory modalities could reinforce each other which ensures that the positive effect of congruent label colors on flavor expectation will be higher with a bottle-opening sound that is also congruent to that flavor.

We expect that colors associated with high-quality flavors lead to a higher flavor expectation with the sound of a cork and colors that are associated with low-quality flavors lead to a higher flavor expectation with the sound of a screw (see Table 2). For example, for a wine bottle with a red label, the expectation of the low-quality associated flavor fruity will increase with the sound of a screw (flavor 1 in Table 2), but with the same red label, the expectation of the high-quality associated flavor spicy will increase with the sound of a cork (flavor 3 in Table 2). Even though fruity and spicy are both congruent to the color red, a different effect is expected for the congruency of sound.

The following hypothesis is formulated:

H3: *The positive effect of congruent label colors on flavor expectation will be higher with a bottle-opening sound that is also congruent to that flavor than with a bottle-opening sound that is not congruent to that flavor.*

Consumer perceptions and purchase intention

The stimuli consumers receive through their senses can influence their perception of a product and purchase intention (Erenkol, 2015). For example, the color red can evoke negative feelings among people. This is due to the negative meanings the color red carries (e.g., transgressions). This negative meaning mainly affects the specific emotion of guilt when seeing the color red on food packaging (Lunardo et al., 2021). Red can also have a positive effect because red is associated with love and passion (Elliot & Maier, 2007) and can evoke positive thoughts regarding red wine because people have romantic associations with wine Kaya and Epps (2004). The above findings about the color red show us that one specific color can evoke different kinds of emotions and product perceptions.

Results from the study by Farooq et al. (2015) show that the design of product packaging is an important component in marketing. The design of the packaging is crucial in the consumers' choice when purchasing a product. It can be concluded that there is a significant positive correlation between product packaging and purchase intention (Farooq et al., 2015). According to Roopchund Randhir et al. (2016), sensory marketing influences the consumers' perception which can increase purchase intention. Mantonakis et al. (2017) also claim that recognition of sensory experiences (e.g., flavor expectation) increases purchase intention. It could be that when a consumer sees a particular color and associates it with a particular flavor, this leads to recognition and ultimately to higher purchase intention.

As discussed above, packaging color and design have strong influences on consumer perception of a product (Farooq et al., 2015) and recognition of sensory experiences increases

purchase intention (Mantonakis et al., 2017). Based on the existing literature about the impact of colors and packaging design on customer perception and purchase intention, the following hypothesis is formulated:

H4: Label color (congruency) has a direct effect on the online purchase intention of red wine.

To test the formulated hypothesis, the purchase intention of the congruent- and incongruent color will be analyzed per flavor (see Table 2.) No particular direction of congruency is expected because a color that is congruent to one flavor may be incongruent to another flavor.

Consumers are more likely to purchase if they can recall sensory experiences such as taste (Mantonakis et al., 2017). For example, consumers may recall a particular taste when seeing a congruent color or hearing a congruent sound. Based on that color and/or sound, the consumer can get a certain flavor expectation with the product in question. People are more likely to purchase if they think they know what the product is or what it tastes like. For example, if you are looking for a "dry" wine but all you know about the wine is that it is "not sweet", you would be less likely to buy the wine than if you know the wine is dry.

Based on the above theory, it is expected that label colors leading to high flavor expectations will automatically lead to higher purchase intention, because the higher the flavor expectation, the more people think they know what the wine tastes like.

The expectation based on recognition and purchase intention theory is that recognition of a congruent label color leads to higher purchase intention than a label color that is not congruent to a certain flavor. We expect this effect to occur even if consumers do not necessarily want to buy a wine with the expected flavor because purchase intention will always be lower if there is no recognition of flavor at all when exposed to a packaging color (Mantonakis et al., 2017). The same applies to the bottle-opening sound. It is expected that

when people recognize the sound and associate the sound with a certain flavor, they are more likely to buy the wine.

Since Mantonakis et al. (2017) claim that recognition of sensory experiences increases purchase intention, it might be that colors or sounds that are congruent to a certain flavor automatically lead to higher purchase intention, because the incongruent colors are not recognizable at all to the regarding flavor. To test both the incongruent and the congruent sound per flavor, the following hypothesis is formulated on two moderation levels (see congruency in Table 2):

H5a: The effect of label-color (congruency) on purchase intention is mediated by flavor expectation when the sound is congruent to that flavor.

H5b: The effect of label-color (congruency) on purchase intention is mediated by flavor expectation when the sound is incongruent to that flavor.

Conceptual model

The hypotheses formulated from the above theory are visually depicted in Figure 1. The conceptual modal is a moderated mediation model. In this model, the label color congruency is the independent variable, online flavor expectation is the mediator, bottle-opening sound congruency is the moderator, and online purchase intention is the dependent variable. All hypotheses of this study will be tested for the flavors with both a congruent/incongruent color and a congruent/incongruent sound. A total of five flavors will be tested which are shown in Table 2 (fruity, flowery, spicy, dry, and woody).

Figure 1

Conceptual Model
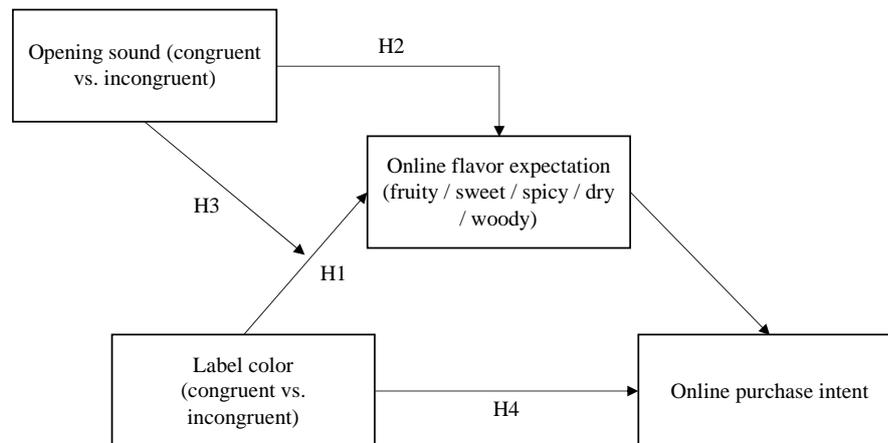
Method

Design

An online experiment was conducted ($n = 198$) with a 4 x 2 mixed design (within participants: Label color x between participants: Bottle-opening sound). The label color was the independent variable (congruent/incongruent) and the online purchase intent was the dependent variable (7-point Likert scale). The online flavor expectation operated as the mediator (scale of 0-10) and the bottle opening sound as the moderator (congruent/incongruent). The participants were randomly assigned to one of the four conditions that are presented in Table 3. To avoid order effects, the label colors order was counterbalanced. Half of the participants were shown the colors in reverse order.

Table 3

Experimental Conditions

Condition	Label color order	Bottle-opening sound
1.	Red, black, orange, white	Screw
2.	White, orange, black, red	Cork
3.	White, orange, black, red	Screw
4.	Red, black, orange, white	Cork

Participants

Participants for this study were gathered through nonprobability sampling (convenience sampling and snowball sampling). The researcher's network was used to recruit respondents and the researcher distributed the survey through social media channels (LinkedIn, Instagram, and WhatsApp). Also, people from the researcher's network shared the survey with their networks and on social media. To participate in this study, respondents had to be at least 18 years old. Respondents who are colorblind or otherwise visually impaired (not corrected by contact lenses or glasses) were excluded from the experiment because they might not see the label color properly. The same applied to respondents who have hearing difficulties and therefore may not properly perceive the bottle-opening sound.

A total of 236 respondents participated in the study. The data from participants who are colorblind ($n = 1$), are otherwise visually impaired ($n = 16$), have hearing difficulties ($n = 3$), or did not finish the entire survey ($n = 18$) were removed from the dataset. The data of the remaining respondents were used for the analysis of the study ($n = 198$). This number of participants is above the predetermined minimum of 100.

The participants were randomly assigned to one of the four conditions, and despite the data exclusions, the participants were almost equally distributed. The data distribution is given in Table 4.

Table 4

Distribution of Experimental Conditions

	Label-color order		
	Red, black, orange, white	White, orange, black, red	Total
Cork	50	48	98
Screw	47	53	100
Total	97	101	198

An overview of the demographic characteristics of the participants is given in tables and are shown in Appendix A. The tables show the distribution of age ($M = 2.85$, $SD = 1.67$), gender, and education.

Similar to the study by Lick et al. (2017), at the start of the survey was asked how often the respondent buys a bottle of wine ($M = 2.68$, $SD = 1.29$) with five response options (*less than once a month, once a month, a few times a month, once a week, more than once a week*). Respondents who buy red wine once a month or less are called "irregular buyers" ($n = 89$) and those who buy red wine more frequently are called "frequent buyers" ($n = 109$). More than half of the respondents are frequent wine buyers.

Materials

The materials used in this study were based on Lick et al. (2017) with the addition of a sound condition. One-half of the respondents were exposed to the sound of a cork, and the other half were exposed to the sound of a screw to see if there are differences in flavor expectations when hearing a different bottle-opening sound. To be certain that respondents were not influenced by seeing a bottle closure, all respondents were exposed to the same pictures. All respondents saw a sealed bottle so that no screw or cork was visible.

Lick et al. (2017) used the following colors in the study: red, black, orange, beige, white, and blue. However, the colors blue and beige did not show significant effects on flavor expectation and were therefore not used in the current study. The flavors (fruity, flowery, dry, spicy, sweet, woody, earthy, and milky) were all included in this current study. The sound effects used for the study are shown in Table 5. The image stimuli are shown in figure 2 to figure 5.

Because the quality association was not known for all eight flavors, not all flavors could be associated with a sound based on literature. Therefore, flavors without a quality association were not included in the analyses (flowery, earthy, milky). However, all eight

flavors were included in the survey to stay close to the survey used by Lick et al. (2017), on which this current study is based. Later, the variables "label color" and bottle-opening sound" were recoded per flavor to congruent and incongruent.

Table 5

Sounds

Stimuli	URL
Cork sound	https://drive.google.com/file/d/1hEv9MiSuc-lWULlJsQ08Oq3BNk7c2Ftn/view?usp=share_link
Screw sound	https://drive.google.com/file/d/1pp70OTGrrBfLJ88OyFge6BONVRahBI3p/view?usp=share_link
Test sound	https://drive.google.com/file/d/1g_2I0gTnCLLphAswwbJK1JjwyROt9c10/view?usp=share_link

Figure 2

Wine Bottle with Red Label

Figure 3

Wine Bottle with White Label

Figure 4

Wine Bottle with Orange Label

Figure 5

Wine Bottle with Black Label

Measurements

Just like in the study from Lick et al. (2017), respondents indicated their flavor expectation per flavor for every bottle on a scale of 0-10 based on the label color and bottle-opening sound by answering the following statement: *Indicate for each flavor below to what extent you would expect this flavor to match the wine in the picture above on a scale of 1 to 10.* The respondents did this four times (once for each label color) for all eight flavor aromas (fruity, flowery, dry, spicy, sweet, woody, earthy, and milky).

Based on the scale of Lee and Shin (2010), purchase intention was measured. Respondents were asked how much they would like to buy the bottle on a 7-point Likert scale (1= *definitely would not, 7= definitely would*).

Procedure

Qualtrics was used to design and conduct the survey. Before respondents started the survey, they were shown an informed consent that included information regarding the

experiment, the duration of the study, and where they had to indicate they were 18 years or older.

After accepting informed consent, the participants had to indicate whether they are colorblind or otherwise visually impaired, and they had to listen to a test sound after which they had to indicate if they could hear the sound. Participants who were colorblind, otherwise visually impaired, or could not hear the test sound were automatically excluded. The remaining participants were randomly assigned to one of the four conditions and could start the survey.

First, the participants had to indicate how often they buy a bottle of red wine. Subsequently, the participants saw a bottle of red wine with a label color depending on the assigned condition. They had to imagine seeing the bottle in an online shop and being able to listen to the sound of opening the bottle in this online shop. The respondents had to listen to the sound by clicking on the sound recording underneath the depicted wine bottle. Based on what they saw and heard, the participants rated each flavor on a scale of 0-10. Lastly, they had to indicate how much they would like to buy the bottle. They did this for all four label colors.

After the respondents rated all four wine bottles, a few demographic questions (gender, age, and education) were asked. At the end of the survey, participants were given a debriefing that clarified the research purpose and explained the four conditions. The entire survey is given in Appendix B.

Data-analysis

To analyze the data, IBM SPSS Statistics 27 was used. To perform the analyses, several variables were recoded. In this way, each flavor had its own color- and sound variable with a congruent and incongruent value. The purchase intention variable remained the same for each flavor.

The data were analyzed for each flavor with both a congruent/incongruent color and a congruent/incongruent sound (see Table 6). The five hypotheses were tested for each flavor by performing a PROCESS-model 7 of Hayes (2022). Since the analysis has been run five times (once for each flavor with color- and sound congruency) the Bonferroni correction was applied, resulting in a threshold of significance of $\alpha = 0.05/5 = 0.01$ which is used throughout the research. Hence, a bootstrapped CI of 99% is used to assess significance. *p*-values are only used to explain the significance of the model as a whole since no bootstrap is available for this.

Table 6

Analyzed Flavors

	Flavor	Congruent color	Incongruent color	Congruent sound	Incongruent sound
1.	Fruity	Red	White	Screw	Cork
2.	Sweet	Orange	Black	Screw	Cork
3.	Spicy	Red	White	Cork	Screw
4.	Dry	Black	Orange	Cork	Screw
5.	Woody	Black	White	Cork	Screw

Results

The five hypotheses of this study are tested per flavor. To test the hypotheses, PROCESS-model 7 of Hayes (2022) is used. Five process analyses have been run (moderated mediation). All confidence intervals are 99% and mean-centered values are used for the interaction effects. The progress regression output for flavor expectation is shown in table 7 and the progress regression output for purchase intention is shown in table 8.

Table 7

Process Regression Output Flavor Expectation.

	Flavor expectation				
	Fruity	Sweet	Spicy	Dry	Woody
	B	B	B	B	B
Constant	4.62	3.38	4.04	4.48	4.17
Color congruency	0.56*	1.53	0.77	1.24*	1.75*
Sound congruency	-0.15	0.85*	0.17	0.46	0.23
Color * sound	-0.02	-0.37	-0.17	0.28	0.67
Total R^2	.01	.11***	.02*	.06***	.11***
F	1.75	16.80	3.20	8.55	16.14

Note. B-values: *significant according to the 99% confidence interval / Total R^2: *p<.05,

**p<.01, ***p<.001

Table 8

Process Regression Output Purchase Intention.

	Purchase intention				
	Fruity	Sweet	Spicy	Dry	Woody
	B	B	B	B	B
Constant	3.12	3.77	3.34	3.46	3.44
Color congruency	0.51	0.59*	0.51*	0.51*	0.45*
Flavor expectation	0.14	0.00	0.11*	0.07	0.08*
Total R^2	.06***	.03**	.05***	.03***	.04***
F	12.86	4.322	9.36	7.03	7.55

Note. B-values: *significant according to the 99% confidence interval / Total R^2: *p<.05,

**p<.01, ***p<.001
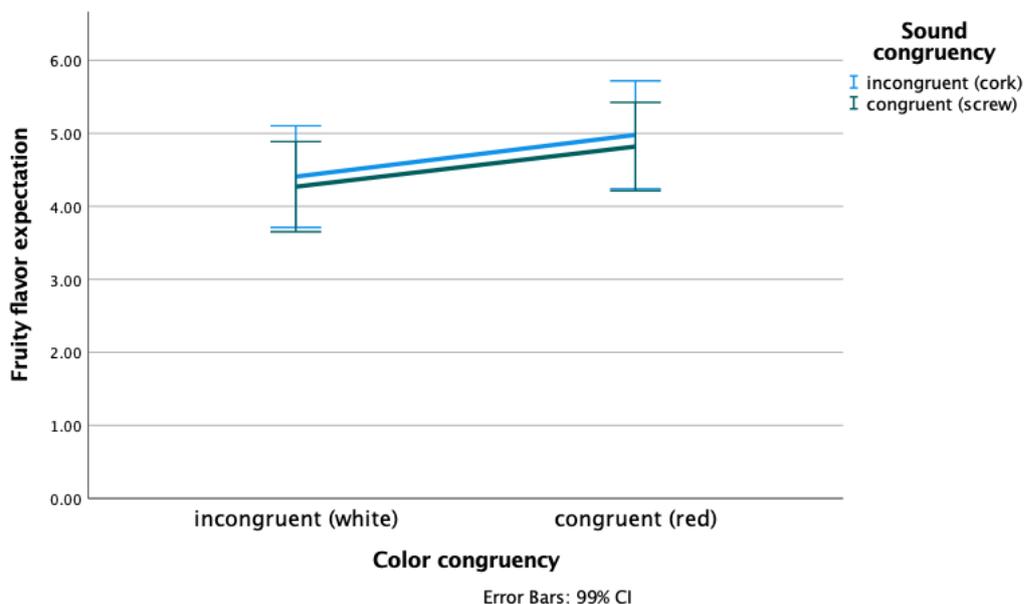
Fruity

The first analysis is about the fruity flavor expectation. The first part of the

PROCESS-model runs "color congruency" as independent variable and "sound congruency"

as moderator and explores if both variables have an influence on the fruity flavor expectation.

This model as a whole does not significantly explain variance (R^2 = .01, F (3,392) = 16.80, p = < .17). Within this model, color congruency shows a significant effect on flavor expectation (B = 0.56, t(392) = 2.21, *99% Bootstrapped CI* = [-0.10, 1.22]). The results support the first hypothesis on fruity flavor expectation: *A red label (congruent to fruity) will lead to a higher fruity flavor expectation than a white label (incongruent to sweet).* However, the model as a whole is not significant. Therefore, no conclusions can be drawn from this model. The effect of sound congruency is not significant (B = -.15, t(392) = -0.59, *99% Bootstrapped CI* = [-0.80, 0.51]). The results do not support the second hypothesis on fruity flavor expectation: *A screw sound (congruent to fruity) will lead to a higher fruity flavor expectation than a cork sound (incongruent to fruity).* The interaction effect is not significant (B = -0.02, t(392) = -0.04, *99% Bootstrapped CI* = [-1.33, 1.29]). The results do not support the third hypothesis on fruity flavor expectation: *The positive effect of a red label on fruity flavor expectation will be higher with a sound of a screw than with a sound of a cork.* Figure 6 shows the interaction effect of fruity flavor expectation by color- and sound congruency.

Figure 6

Line Chart of Fruity Flavor Expectation by Color Congruency and Sound Congruency

The second part of the PROCESS-model predicts "purchase intention" based on "color congruency" and "fruity flavor expectation". This model as a whole is significant ($R^2 =$ .06, $F (2,393) = 12.86$ $p = <.001$). Within this model, color congruency has a significant effect on purchase intention ($B = 0.51$, $t(393) = 2.79$, *99% Bootstrapped CI =* [0.04, 1.01]). As the congruent color for a fruity flavor is red (and the incongruent color is white), this effect means that participants had a higher purchase intention for bottles with red labels than for bottles with white labels. The results support the fourth hypothesis for the fruity flavor expectation*: Label color has a direct effect on the online purchase intention of red wine.* Within this model, there is no evidence for a mediation effect when the moderator is not congruent (*Indirect effect* = .08, *99% Bootstrapped CI* [-.06, .28]). There is no evidence for such an effect either when the moderator is congruent (*Indirect effect* = .08, *99% Bootstrapped CI* [-.04, .25]). Lastly, there is no significant moderated mediation. *Index* = .00, *99% Bootstrapped CI* [-.22, .20]. The results do not support the last hypotheses on fruity flavor expectation, *a*: *The effect of label-color (congruency) on purchase intention, is mediated by fruity flavor expectation with the sound of a screw, b: The effect of label-color (congruency) on purchase intention, is mediated by fruity flavor expectation with the sound of a cork.*

Table 9

Correlations, Means, and Standard Deviations of Model Variables for Fruity Flavor Expectation

|		*M*	*SD*	1.	2.	3.
1.	Purchase intention	3.77	1.80			
2.	Color congruency	0.50	0.50	0.16*		
3.	Sound congruency	0.51	0.50	-0.06	0.00	
4.	Flavor Expectation	4.62	2.53	0.21*	0.03	0.56

Note. *Significant according to the 99% confidence interval

Sweet

The second analysis is about the sweet flavor expectation. The first part of the PROCESS-model runs "color congruency" as independent variable and "sound congruency" as moderator and explores if both variables have an influence on the sweet flavor expectation. This model as a whole is significant (R^2 = .11, F (3,392) = 16.80, p = < .001). Color congruency has a significant effect on flavor expectation (B = 1.53, t(392) = 6.16, *99% Bootstrapped CI* = [0.88, 2.17]). The results support the first hypothesis on sweet flavor expectation: *An orange label (congruent to sweet) will lead to a higher sweet flavor expectation than a black label (incongruent to sweet).* The effect of sound congruency is also significant (B = 0.85, t(392) = 3.44, *99% Bootstrapped CI* = [0.21, 1.50]). The results support the second hypothesis on sweet flavor expectation: *A screw sound (congruent to sweet) will lead to a higher sweet flavor expectation than a cork sound (incongruent to sweet).* The interaction effect is not significant (B = -0.37, t(392) = -0.76, *99% Bootstrapped CI* = [-1.66, 0.91]). The results do not support the third hypothesis on sweet flavor expectation: *The positive effect of an orange label on sweet flavor expectation will be higher with a sound of a screw than with a sound of a cork.* Figure 7 shows the interaction effect of sweet flavor expectation by color- and sound congruency.

Figure 7

Line Chart of Sweet Flavor Expectation by Color Congruency and Sound Congruency
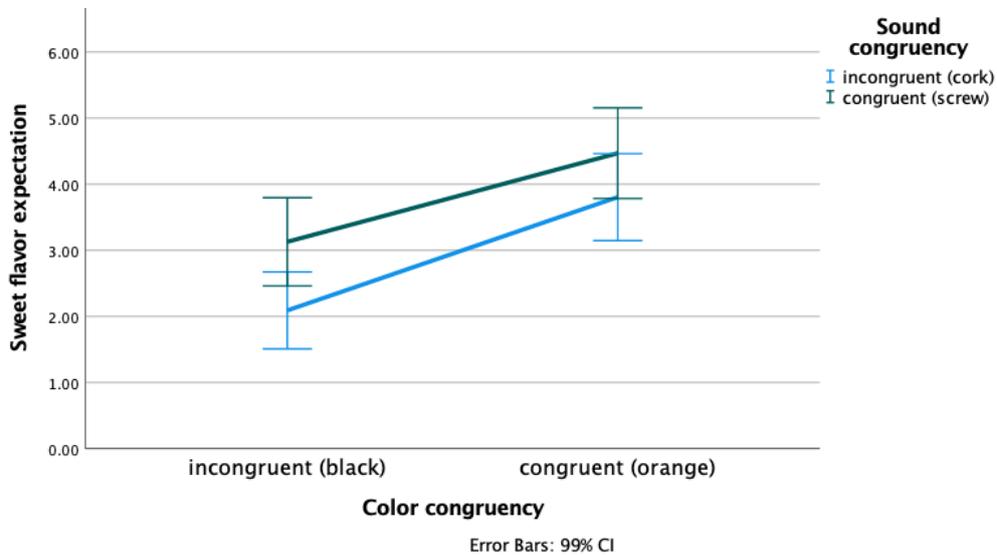
The second part of the PROCESS-model predicts "purchase intention" based on "color congruency" and "sweet flavor expectation". This model as a whole is significant ($R^2 =$ .03, F (2,393) = 5.07 p = .007). Within this model, the color congruency has a significant effect on purchase intention (B = 0.59, t(393) = 3.05, *99% Bootstrapped CI* = [0.09, 1.09]). As the congruent color for a sweet flavor is orange (and the incongruent color is black), this effect means that participants had a higher purchase intention for bottles with black labels than for bottles with orange labels. The results support the fourth hypothesis for the sweet flavor expectation*: Label color has a direct effect on the online purchase intention of red wine.* Within this model, there is no evidence for a mediation effect when the moderator is not congruent (*Indirect effect* = .00, *99% Bootstrapped CI* [-0.19, 0.21]). There is no evidence for such an effect either when the moderator is congruent (*Indirect effect* = .00, *99% Bootstrapped CI* [-0.16, 0.18]). Finally, there is no significant moderated mediation. *Index =* .00, 99% *Bootstrapped CI* [-0.09, 0.09]. The results do not support the last hypotheses on sweet flavor expectation, *a*: *The effect of label-color (congruency) on purchase intention, is mediated by sweet flavor expectation with the sound of a screw, b: The effect of label-color*

(congruency) on purchase intention, is mediated by sweet flavor expectation with the sound

of a cork.

Table 10

Correlations, Means, and Standard Deviations of Model Variables for Sweet Flavor

Expectation

		M	*SD*	1.	2.	3.
1.	Purchase intention	3.77	1.87			
2.	Color congruency	0.50	0.50	0.16*		
3.	Sound congruency	0.51	0.50	-0.06	0.00	
4.	Flavor Expectation	3.38	2.61	0.05	0.29*	0.16*

*Note.* *Significant according to the 99% confidence interval

Spicy

The third analysis is about the spicy flavor expectation. The first part of the PROCESS-model runs "color congruency" as independent variable and "sound congruency" as moderator and explores if both variables have an influence on the spicy flavor expectation. This model as a whole is significant ($R^2 = .02$, $F (3,392) = 3.20$, $p = .023$). Color congruency has a significant effect on flavor expectation ($B = 0.77$, $t(392) = 3.02$, *99% Bootstrapped CI =* [0.11, 1.43]). The results support the first hypothesis on spicy flavor expectation: *A red label (congruent to spicy) will lead to a higher spicy flavor expectation than a white label (incongruent to spicy).* The effect of sound congruency is not significant ($B = 0.16$, $t(392) = 0.64$, *99% Bootstrapped CI =* [-0.50, 0.82]). The results do not support the second hypothesis on spicy flavor expectation: *A cork sound (congruent to spicy) will lead to a higher spicy flavor expectation than a screw sound (incongruent to spicy).* The interaction effect is not significant ($B = -0.17$, $t(392) = -0.33$, *99% Bootstrapped CI =* [-1.48, 1.15]). The results do not support the third hypothesis on spicy flavor expectation: *The positive effect of a red label*

on spicy flavor expectation will be higher with a sound of a cork than with a sound of a screw. Figure 8 shows the interaction effect of spicy flavor expectation by color- and sound congruency.

Figure 8

Line Chart of Spicy Flavor Expectation by Color Congruency and Sound Congruency
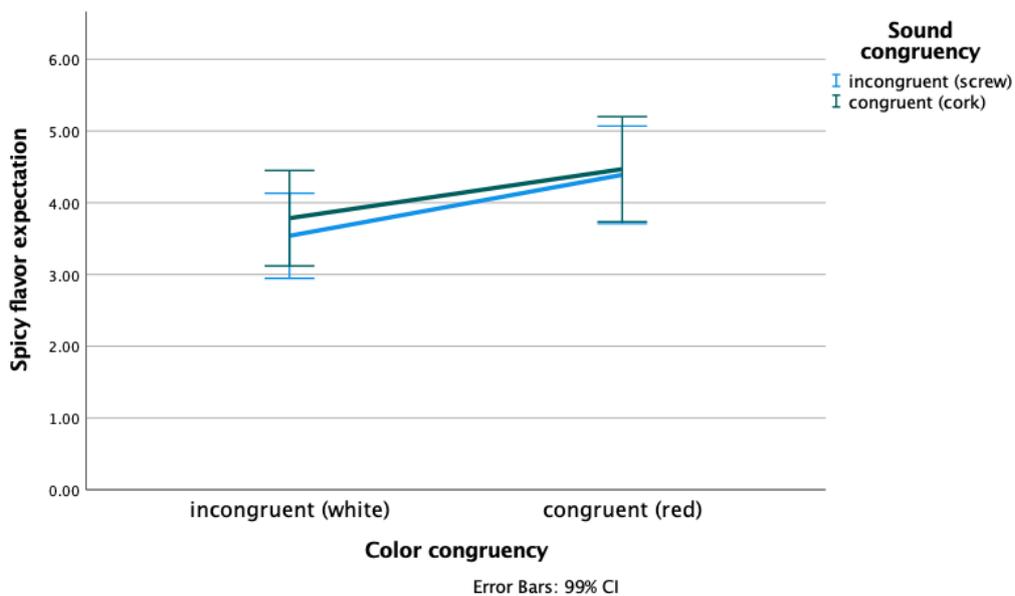
The second part of the PROCESS-model predicts "purchase intention" based on "color congruency" and "spicy flavor expectation". This model as a whole is significant ($R^2 =$ .05, F (2,393) = 9.36 p = <.001). Within this model, the color congruency has a significant effect on purchase intention (B = 0.51, t(393) = 2.75, *99% Bootstrapped CI* = [0.03, 0.99]). As the congruent color for a spicy flavor is red (and the incongruent color is white), this effect means that participants had a higher purchase intention for bottles with red labels than for bottles with white labels. The results support the fourth hypothesis for the spicy flavor expectation*: The congruency of label color to spicy flavor has a direct effect on the online purchase intention of red wine.* Within this model, there is no evidence for a mediation effect when the moderator is not congruent (*Indirect effect* = .09, *99% Bootstrapped CI* [-0.01,

0.27]). There is no evidence for such an effect either when the moderator is congruent (*Indirect effect* = .07, *99% Bootstrapped CI* [-0.03, 0.25]). Lastly, there is no significant moderated mediation. *Index* = -.02, 99% *Bootstrapped CI* [-0.21, 0.16]. The results do not support the last hypotheses on spicy flavor expectation, *a*: *The effect of label-color (congruency) on purchase intention, is mediated by spicy flavor expectation with the sound of a cork, b: The effect of label-color (congruency) on purchase intention, is mediated by spicy flavor expectation with the sound of a screw.*

Table 11

Correlations, Means, and Standard Deviations of Model Variables for Spicy Flavor Expectation

		M	*SD*	1.	2.	3.
1.	Purchase intention	3.77	1.87			
2.	Color congruency	0.50	0.50	0.16*		
3.	Sound congruency	0.49	0.50	0.06	0.00	
4.	Flavor Expectation	4.05	2.55	0.17*	0.15*	0.03

Note. *Significant according to the 99% confidence interval

Dry

The fourth analysis is about the dry flavor expectation. The first part of the PROCESS-model runs "color congruency" as independent variable and "sound congruency" as moderator and explores if both variables have an influence on the dry flavor expectation. This model as a whole is significant (R^2 = .06, F (3,392) = 8.55, p = < .001). Color congruency has a significant effect on flavor expectation (B = 1.24, t(392) = 4.72, *99% Bootstrapped CI* = [0.56, 1.92]). The results support the first hypothesis on dry flavor expectation: *A black label (congruent to dry) will lead to a higher dry expectation than an orange label (incongruent to dry).* The effect of sound congruency is also significant (B =

0.46, $t(392) = 1.75$, *99% Bootstrapped CI* = [-0.22, 1.14]). The results support the second hypothesis on dry flavor expectation: *A cork sound (congruent to dry) will lead to a higher dry flavor expectation than a screw sound (incongruent to dry).* The interaction effect is not significant ($B = 0.28$, $t(392) = 0.53$, *99% Bootstrapped CI* = [-1.08, 1.63]). The results do not support the third hypothesis on dry flavor expectation: *The positive effect of a black label on dry flavor expectation will be higher with a sound of a cork than with a sound of a screw.* Figure 9 shows the interaction effect of dry flavor expectation by color- and sound congruency.

Figure 9

Line Chart of Dry Flavor Expectation by Color Congruency and Sound Congruency
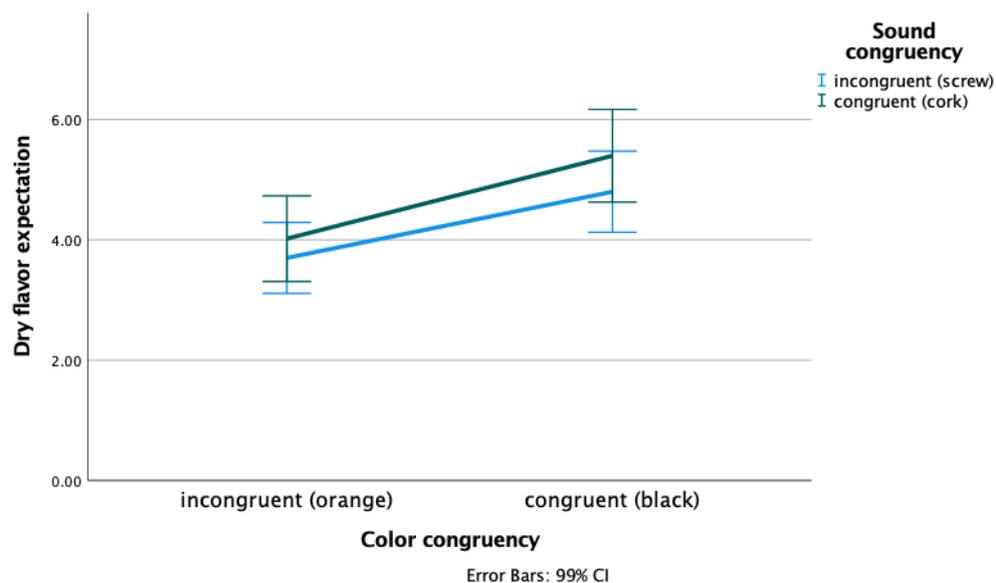
The second part of the PROCESS-model predicts "purchase intention" based on "color congruency" and "dry flavor expectation". This model as a whole is significant (R^2 = .03, $F(2,393) = 7.03$ $p = .001$). Within this model, the color congruency has a significant effect on purchase intention ($B = 0.51$, $t(393) = 2.66$, *99% Bootstrapped CI* = [0.01, 1.00]). As the congruent color for a dry flavor is black (and the incongruent color is orange), this

effect means that participants had a higher purchase intention for bottles with black labels than for bottles with orange labels. The results support the fourth hypothesis for the dry flavor expectation*: Label color has a direct effect on the online purchase intention of red wine.* Within this model, there is no evidence for a mediation effect when the moderator is not congruent (*Indirect effect* = 0.08, *99% Bootstrapped CI* [-0.04, 0.24]). There is no evidence for such an effect either when the moderator is congruent (*Indirect effect* = .10, *99% Bootstrapped CI* [-0.05, 0.30]). Finally, there is no significant moderated mediation. *Index* = .02, 99% *Bootstrapped CI* [-.010, 0.18]. The results do not support the last hypotheses on dry flavor expectation, *a*: *The effect of label-color (congruency) on purchase intention, is mediated by dry flavor expectation with the sound of a cork, b: The effect of label-color (congruency) on purchase intention, is mediated by dry flavor expectation with the sound of a screw.*

Table 12

Correlations, Means, and Standard Deviations of Model Variables for Dry Flavor Expectation

		M	SD	1.	2.	3.
1.	Purchase intention	3.77	1.87			
2.	Color congruency	0.50	0.50	0.16*		
3.	Sound congruency	0.49	0.50	0.06	0.00	
4.	Flavor Expectation	4.48	2.68	0.13*	0.23*	0.09

*Note.* *Significant according to the 99% confidence interval

Woody

The fifth analysis is about the woody flavor expectation. The first part of the PROCESS-model runs "color congruency" as independent variable and "sound congruency" as moderator and explores if both variables have an influence on the woody flavor

expectation. This model as a whole is significant (R^2 = .11, F (3,392) = 16.14, p = < .001). Color congruency has a significant effect on flavor expectation (B = 1.75, t(392) = 6.78, *99% Bootstrapped CI* = 1.08, 2.42]). The results support the first hypothesis on woody flavor expectation: *A black label (congruent to woody) will lead to a higher woody flavor expectation than a white label (incongruent to woody).* The effect of sound congruency is not significant (B = 0.23, t(392) = 0.89, *99% Bootstrapped CI* = [1.08, 2.42]). The results do not support the second hypothesis on woody flavor expectation: *A cork sound (congruent to woody) will lead to a higher woody flavor expectation than a screw sound (incongruent to woody).* The interaction effect is not significant (B = 0.67, t(392) = 1.30, *99% Bootstrapped CI* = [-0.67, 2.01]). The results do not support the third hypothesis on woody flavor expectation: *The positive effect of a black label on woody flavor expectation will be higher with a sound of a cork than with a sound of a screw.* Figure 10 shows the interaction effect of woody flavor expectation by color- and sound congruency.

Figure 10

Line Chart of Woody Flavor Expectation by Color Congruency and Sound Congruency
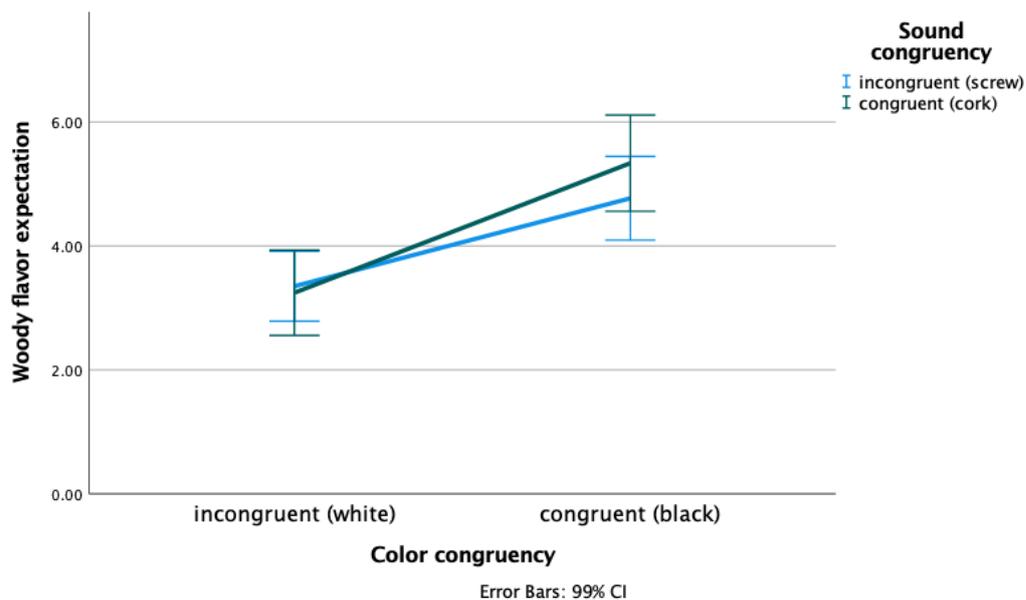
The second part of the PROCESS-model predicts "purchase intention" based on "color congruency" and "woody flavor expectation". This model as a whole is significant (R^2 = .04, F (2,393) = 7.55 p .001). Within this model, the color congruency has a significant effect on purchase intention (B = 0.45, t(393) = 2.32, *99% Bootstrapped CI* = [-0.96, 0.96]). As the congruent color for a woody flavor is black (and the incongruent color is white), this effect means that participants had a higher purchase intention for bottles with black labels than for bottles with white labels. The results support the fourth hypothesis for the woody flavor expectation*: Label color has a direct effect on the online purchase intention of red wine.* Within this model, there is no evidence for a mediation effect when the moderator is not congruent (*Indirect effect* = .11, *99% Bootstrapped CI* [-0.31, 0.31]). There is no evidence for such an effect either when the moderator is congruent (*Indirect effect* = .17, *99% Bootstrapped CI* [-0.04, 0.44]). Lastly, there is no significant moderated mediation. *Index* = .53, 99% *Bootstrapped CI* [-0.06, 0.23]. The results do not support the last hypotheses on woody flavor expectation, *a*: *The effect of label-color (congruency) on purchase intention, is mediated by woody flavor expectation with the sound of a cork, b: The effect of label-color (congruency) on purchase intention, is mediated by woody flavor expectation with the sound of a screw.*

Table 13

Correlations, Means, and Standard Deviations of Model Variables for Woody Flavor Expectation

		M	SD	1.	2.	3.
1.	Purchase intention	3.77	1.87			
2.	Color congruency	0.50	0.50	0.16*		
3.	Sound congruency	0.49	0.50	0.06	0.00	
4.	Flavor Expectation	4.17	2.72	0.15*	0.32*	0.04

Note. *Significant according to the 99% confidence interval

Exploratory analysis

It was expected that there would be a relationship between flavor expectation and purchase intention. To explore this, an exploratory analysis was conducted. The analysis shows that there is a small correlation between mean flavor expectation and mean purchase intent (0.29) with a 99% *Bootstrapped CI* [0.06, 0.49]. We can conclude with caution that a high overall flavor expectation of a wine bottle leads to a higher purchase intention of that wine bottle. The correlation between flavor expectation and purchase intent is depicted in Figure 11.

Figure 11

Scatter Plot of Mean Purchase intention by Mean Flavor Expectation
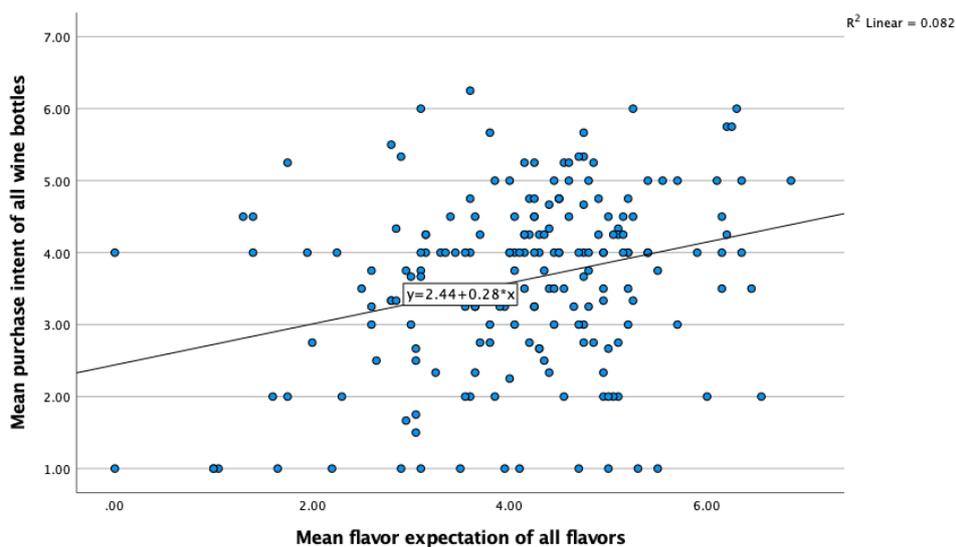
Note. Correlation: Sqrt(0.082) = 0.286356421265527

Discussion

This study investigated how cross-modal correspondences between label colors, bottle-opening sounds, and wine flavors affect the consumers' flavor expectations and online purchase intention of bottles of red wine. To test this, five hypotheses were formulated about

color- and sound congruency to flavors, based on existing literature about cross-modal correspondences and purchase intention.

Implications

The first hypothesis was that label colors with high congruency to a flavor will lead to a higher flavor expectation for that flavor than label colors with low congruency to that flavor. This study found significant evidence for this effect with all five analyzed flavors, which confirms the expectations and are in line with the results by Lick et al. (2017). Although a significant effect was found for all flavors, the results of fruity flavor should be interpreted with caution, because the model as a whole does not significantly explain variance for fruity. To better examine these results, more sophisticated statistics could be applied with greater data distribution. We expected black would be associated with more flavors than other colors. In the flavor analyses where the black label was examined, it was found that a black label caused a higher flavor expectation for that flavor than other colors. These results are consistent with those of Lick et al. (2017), Baptista et al. (2021), and Delgado et al. (2013) who also found that black labels and/or product packaging are associated with more flavors than other colors. Because the color black is associated with many flavors compared to other colors, black is a decent color to use for marketers when they want to create a not-too-specific flavor expectation in the consumer's brain.

The second hypothesis was that a bottle-opening sound that is congruent in quality to a flavor will lead to a higher flavor expectation for that flavor than a bottle-opening sound with low congruency to that flavor. The results of this study show significant effects of congruency, namely for the flavors sweet and dry. These findings are in line with earlier research on quality associations based on flavors and sounds (Dippong & Mihali, 2019; Reynolds et al., 2018; Sáenz-Navajas et al., 2015). Based on the results about sound congruency on flavor expectations, wine retailers could use a screw if they want their

consumers to have a sweet flavor expectation with a specific wine, and a cork to have a dry flavor expectation for example.

The third hypothesis was that the positive effect of congruent label colors on flavor expectation is higher with a bottle-opening sound that is also congruent to that flavor. This study found no significant moderation effect at all. A reason for this could be that not all respondents listen to the bottle-opening sound equally well. It could also be that there is no effect at all because color and sound already show an effect on flavor expectation separately from each other, and a combination of these factors may not lead to an additional stronger effect. These findings are not in line with the study from Lick (2022) about how different sensory modalities can reinforce each other.

The fourth hypothesis was about the direct effect of label color on purchase intention. To test the hypothesis, the purchase intention of the congruent- and incongruent colors is analyzed per flavor (see Table 2.) No particular direction of congruency was expected because a color that is congruent to one flavor may be incongruent to another flavor. This study found significant evidence for all colors that are congruent/incongruent to the analyzed flavors. This means that label color affects the purchase intention which confirms the expectations and is in line with the results by Farooq et al. (2015) and Mantonakis et al. (2017). Primarily, black labels have a positive effect on purchase intention followed by red labels, in contrast to white labels which have a negative effect on purchase intention. These results are not based on congruency. When retailers want to increase their wine sales, they should avoid white labels and mainly use the colors black and red for the labels of wine bottles that are meant to be sold.

The fifth and last hypothesis was about moderated mediation. This hypothesis described that the effect of label-color (congruency) on purchase intention is mediated by flavor expectation when the bottle-opening sound is incongruent/congruent. This study found

significant evidence of label color on purchase intent, label color congruency on flavor expectation, and for some flavors an effect of sound on flavor expectation. Despite these findings, the effect of color on purchase intent cannot be explained with an effect of color congruency on flavor expectation that leads to purchase intent. This study found no significant evidence of moderated mediation for any flavor. Despite more than half of the respondents being frequent wine buyers, there are still many respondents (44.9%) who do not buy wine very often. It may be that this group of respondents has too little interest in wine to make a good judgment about it, which may have influenced the research results.

The exploratory analysis of mean flavor expectation and mean purchase intention shows that there is a correlation between flavor expectation and purchase intention. Bottles for which participants had a higher overall flavor expectation were more likely to be purchased than bottles with a low overall flavor expectation. It could be that the participants had a higher purchase intention because they recognized the flavor they associated the bottle with. These findings are in line with the results by Mantonakis et al. (2017), which show that recognition of sensory experiences (flavor expectation) increases purchase intention.

Limitations and further research

There are several limitations in this study that can be taken into account for better reliability of further in-depth studies. When sound and color (congruency) both influence flavor expectation and flavor expectation influences purchase intention, flavor expectation can be a mediator for both color and sound. A model that incorporates both of these is too complex. However, there is literature on the effect of sound on customer perception and quality associations of bottle-opening sound (Mantonakis et al., 2017; Reynolds et al., 2018; Spence & Wang, 2017). Based on the literature about sound associations, we assume that bottle-opening sound may also have a direct effect on purchase intention and could be explored in further research.

The second limitation is that respondents had to imagine seeing the bottles of wine in an online shopping environment. However, it could be that not everyone imagines this equally well resulting in the sensory stimulation not being the same for everyone. For follow-up research, a simulated online shop could be included in the survey to ensure that respondents do not have to imagine, and all have the same experience.

The third limitation is that it is uncertain whether respondents actually play the sound and fill in their flavor expectations influenced by that sound. Because the results show a significant effect of sound on flavor expectation, we can assume that respondents listened to the sound. However, it is not clear whether this effect is actually due to the association with a cork/screw. It could be that the audio sounded different to one respondent than to another because all respondents listened to the audio through their own devices. To eliminate this doubt in future research, it could be decided to conduct a lab study where respondents participate in the survey experiment under supervision, and all hear the audio through the same device.

The fourth limitation is that in this current study, not all flavors from Lick et al. (2017) were included in the analysis. This is because the congruent sounds were based on quality association and not every flavor had a quality association found in the literature (Dippong & Mihali, 2019; Reynolds et al., 2018; Spence & Wang, 2017; Sáenz-Navajas et al., 2015). Investigating quality associations of different wine flavors could be an interesting topic for future research. In addition, the quality association of colors was also not examined because this current study focused on quality expectations of flavor and sound and the influence of color congruency. Follow-up research could look beyond that and examine the quality association of colors regarding wine flavors for example.

The fifth limitation is that we know from the survey results what the flavor expectations and purchase intentions are, based on label color and bottle-opening sound.

However, we do not know if the flavor expectation created by the respondents online matches the real experience and customer satisfaction. To measure customer satisfaction, a similar survey could be set up where respondents have to taste the wines after participating in the survey that investigates their expectations. After tasting the wines, the respondents have to fill out the survey again to measure their experience and product perception. In this way, customer expectations can be compared to customer satisfaction and purchase intention.

The sixth limitation is that 44,9% of the respondents are not frequent wine buyers. The fact that almost half of the participants do not buy frequently wine, could have influenced the results of this study since they could not make a good judgment about the different wine flavors on the label colors and bottle-opening sounds. For follow-up research, a decision could be made to conduct the survey only among frequent wine buyers.

The seventh limitation is that this current study examined a select number of colors and flavors. In case more flavors and/or colors are used in a study, respondents would have more freedom to make associations between flavors and colors, which may be more in line with reality. However, in this case, a bigger sample would be needed for high reliability.

The eighth limitation is about ecological validity. The wines used in the study are not real wines and therefore do not fully match reality. In addition, bottles with a screw are rarely sealed, which could lead to the respondents' expectations are still influenced by the type of bottle in the picture rather than just the label color and opening sound.

The last limitation is that the survey of this study is distributed in the researcher's network. This means that the respondents are not random, which may lead to an unrepresentative distributed sample of the population of wine buyers.

Conclusion

In conclusion, this study answered the formulated research question partially: *How do cross-modal correspondences between label colors, bottle-opening sounds, and wine flavors*

affect the consumers' flavor expectation and online purchase intention of bottles of red wine?
The results show several cross-modal correspondences and that label color affects online purchase intention, but we found no evidence for the moderated mediation effect. However, this study contributes to a better understanding of the complex interaction between color, sound, and flavor expectations. Although this study shows only significant results of the direct effects of label-color (congruency) on flavor expectation and purchase intention (and some effects of bottle-opening sound on flavor expectation), this study provides a good starting point for further in-depth studies about online cross-modal correspondences between colors, sounds, and flavor expectations in marketing. The significant effects are in line with earlier studies. The results of this current study are relevant for marketing and represent an addition to the scientific knowledge of cross-modal similarities between color- and sound congruency to flavors on purchase intention. The results of this study that contribute to the knowledge of cross-modal correspondences allow marketers to create a desired effect that positively influences the customer experience. For example, marketers can use the color black when they want to create a not-too-specific flavor expectation in the consumer's brain and wine retailers can use a screw to create a sweet flavor expectation or a cork to create a dry flavor expectation. Using the right combinations of sensory stimuli, consumers can be triggered for the desired results of online flavor expectation and/or purchase intention. A few clear limitations of the current study have been identified and should be taken into account for further research about moderated mediation between colors, sounds, flavors, and purchase intent.

References

Arboleda, A. M., Manfredi, L. C., & Arroyo, C. C. (2021). Savoring Post-Conflict: Cause-Related Marketing Influencing Colombian Fruit Taste Expectation and Product Evaluation. *Journal of International Food &Amp; Agribusiness Marketing*, *34*(2), 176–194. https://doi.org/10.1080/08974438.2021.1988795

Baptista, I., Valentin, D., Saldaña, E., & Behrens, J. (2021). Effects of packaging color on expected flavor, texture, and liking of chocolate in Brazil and France. *International Journal of Gastronomy and Food Science*, *24*, 100340. https://doi.org/10.1016/j.ijgfs.2021.100340

Bonn, M. A., Kim, W. G., Kang, S., & Cho, M. (2015). Purchasing Wine Online: The Effects of Social Influence, Perceived Usefulness, Perceived Ease of Use, and Wine Involvement. *Journal of Hospitality Marketing &Amp; Management*, *25*(7), 841–869. https://doi.org/10.1080/19368623.2016.1115382

Chandran, K. M., Prabhune, P., & Sen, D. (2014). Sound Association for Product-Sound Design Using Semiotics. *ICoRD'15 – Research Into Design Across Boundaries Volume 1*, 491–503. https://doi.org/10.1007/978-81-322-2232-3_43

Delgado, C., Gómez-Rico, A., & Guinard, J. X. (2013). Evaluating bottles and labels versus tasting the oils blind: Effects of packaging and labeling on consumer preferences, purchase intentions and expectations for extra virgin olive oil. *Food Research International*, *54*(2), 2112–2121. https://doi.org/10.1016/j.foodres.2013.10.021

Dippong, T., & Mihali, C. (2019). Novel approach to red wine sensory evaluation. *Journal of Agroalimentary Processes and Technologies*, *25*(1), 36–41. https://www.journal-of-agroalimentary.ro/admin/articole/72573L7_Thomas_Dippong_2019_25(1)_36-41.pdf

Elliot, A. J., & Maier, M. A. (2007). Color and Psychological Functioning. *Current Directions in Psychological Science*, *16*(5), 250–254. https://doi.org/10.1111/j.1467-8721.2007.00514.x

Erenkol, A. D. (2015). Sensory Marketing. *Journal of Administrative Sciences and Policy Studies*, *3*(1). https://doi.org/10.15640/jasps.v3n1a1

Falode, B. O., Amubode, A. A., Adegunwa, M. O., & Ogunduyile, S. R. (2016). Online and Offline Shopping Motivation of Apparel Consumers in Ibadan Metropolis, Nigeria. *International Journal of Marketing Studies*, *8*(1), 150. https://doi.org/10.5539/ijms.v8n1p150

Farooq, S., Sub, B., Habib, S., & Aslam, S. (2015). Influence of product packaging on consumer purchase intentions. *International Journal of Economics*, *3*(12), 538–547.

Garber, L. L., Hyatt, E. M., & Nafees, L. (2015). The Effects of Food Color on Perceived Flavor: A Factorial Investigation in India. *Journal of Food Products Marketing*, *22*(8), 930–948. https://doi.org/10.1080/10454446.2014.885864

Hagtvedt, H., & Brasel, S. A. (2016). Cross-Modal Communication: Sound Frequency Influences Consumer Responses to Color Lightness. *Journal of Marketing Research*, *53*(4), 551–562. https://doi.org/10.1509/jmr.14.0414

Hamilton-Fletcher, G., Wright, T. D., & Ward, J. (2016). Cross-Modal Correspondences Enhance Performance on a Colour-to-Sound Sensory Substitution Device. *Multisensory Research*, *29*(4–5), 337–363. https://doi.org/10.1163/22134808-00002519

Harun, A. F., Ruslan, N., Wan Adnan, W. A., Suliman, S. I., Ismail, J., & Baharin, H. (2020). Digitizing food experience: Food taste perception on digital image and true form using hashtags. *Bulletin of Electrical Engineering and Informatics*, *9*(5), 2141–2153. https://doi.org/10.11591/eei.v9i5.2252

Hayes, A. F. (2022). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. Guilford Publications.

Hsin Chang, H., & Wang, H. (2011). The moderating effect of customer perceived value on online shopping behaviour. *Online Information Review*, *35*(3), 333–359. https://doi.org/10.1108/14684521111151414

Hult, G. T. M., Sharma, P. N., Morgeson, F. V., & Zhang, Y. (2019). Antecedents and Consequences of Customer Satisfaction: Do They Differ Across Online and Offline Purchases? *Journal of Retailing*, *95*(1), 10–23. https://doi.org/10.1016/j.jretai.2018.10.003

Imschloss, M., & Kuehnl, C. (2019). Feel the Music! Exploring the Cross-modal
     Correspondence between Music and Haptic Perceptions of Softness. *Journal of
     Retailing*, *95*(4), 158–169. https://doi.org/10.1016/j.jretai.2019.10.004

Kaya, N., & Epps, H. H. (2004). Relationship between color and emotion: A study of college
     students. *College Student Journal*, *38*(3), 396–405.

Krishna, A. (2012). An integrative review of sensory marketing: Engaging the senses to
     affect perception, judgment and behavior. *Journal of Consumer Psychology*, *22*(3),
     332–351. https://doi.org/10.1016/j.jcps.2011.08.003

Lee, K. H., & Shin, D. (2010). Consumers' responses to CSR activities: The linkage between
     increased awareness and purchase intention. *Public Relations Review*, *36*(2), 193–
     195. https://doi.org/10.1016/j.pubrev.2009.10.014

Lick, E. (2022). "Multimodal Sensory Marketing" in retailing: the role of intra- and
     intermodality transductions. *Consumption Markets &Amp; Culture*, *25*(3), 252–
     271. https://doi.org/10.1080/10253866.2022.2046564

Lick, E., König, B., Kpossa, M. R., & Buller, V. (2017). Sensory expectations generated by
     colours of red wine labels. *Journal of Retailing and Consumer Services*, *37*, 146–
     158. https://doi.org/10.1016/j.jretconser.2016.07.005

Lunardo, R., Saintives, C., & Chaney, D. (2021). Food packaging and the color red: How
     negative cognitive associations influence feelings of guilt. *Journal of Business
     Research*, *134*, 589–600. https://doi.org/10.1016/j.jbusres.2021.05.052

Mantonakis, A., Schwarz, N., Wudarzewski, A., & Yoon, C. (2017). Malleability of taste
     perception: biasing effects of rating scale format on taste recognition, product
     evaluation, and willingness to pay. *Marketing Letters*, *28*(2), 293–
     303. https://doi.org/10.1007/s11002-016-9416-z

Petit, O., Velasco, C., & Spence, C. (2019). Digital Sensory Marketing: Integrating New
     Technologies Into Multisensory Online Experience. *Journal of Interactive
     Marketing*, *45*, 42–61. https://doi.org/10.1016/j.intmar.2018.07.004

Reynolds, D., Rahman, I., Bernard, S., & Holbrook, A. (2018). What effect does wine bottle closure type have on perceptions of wine attributes? *International Journal of Hospitality Management*, *75*, 171–178. https://doi.org/10.1016/j.ijhm.2018.05.023

Roopchund Randhir, Khirodhur Latasha, Panyandee Tooraiven, & Bappoo Monishan. (2016). Analyzing the Impact of Sensory Marketing on Consumers: A Case Study of KFC. *Journal of US-China Public Administration*, *13*(4). https://doi.org/10.17265/1548-6591/2016.04.007

Sáenz-Navajas, M. P., Avizcuri, J. M., Ballester, J., Fernández-Zurbano, P., Ferreira, V., Peyron, D., & Valentin, D. (2015). Sensory-active compounds influencing wine experts' and consumers' perception of red wine intrinsic quality. *LWT - Food Science and Technology*, *60*(1), 400–411. https://doi.org/10.1016/j.lwt.2014.09.026

Simner, J., Cuskley, C., & Kirby, S. (2010). What Sound Does That Taste? Cross-Modal Mappings across Gustation and Audition. *Perception*, *39*(4), 553–569. https://doi.org/10.1068/p6591

Spence, C. (2011). Crossmodal correspondences: A tutorial review. *Attention, Perception, &Amp; Psychophysics*, *73*(4), 971–995. https://doi.org/10.3758/s13414-010-0073-7

Spence, C. (2019). On the Relationship(s) Between Color and Taste/Flavor. *Experimental Psychology*, *66*(2), 99–111. https://doi.org/10.1027/1618-3169/a000439

Spence, C., & Levitan, C. A. (2021). Explaining Crossmodal Correspondences Between Colours and Tastes. *I-Perception*, *12*(3), 204166952110182. https://doi.org/10.1177/20416695211018223

Spence, C., Levitan, C. A., Shankar, M. U., & Zampini, M. (2010). Does Food Color Influence Taste and Flavor Perception in Humans? *Chemosensory Perception*, *3*(1), 68–84. https://doi.org/10.1007/s12078-010-9067-z

Spence, C., Wan, X., Woods, A., Velasco, C., Deng, J., Youssef, J., & Deroy, O. (2015). On tasty colours and colourful tastes? Assessing, explaining, and utilizing crossmodal correspondences between colours and basic tastes. *Flavour*, *4*(1). https://doi.org/10.1186/s13411-015-0033-1

Spence, C., & Wang, Q. (2017). Assessing the Impact of Closure Type on Wine Ratings and Mood. *Beverages*, *3*(4), 52. https://doi.org/10.3390/beverages3040052

Vázquez, M. B., Curia, A., & Hough, G. (2009). Sensory descriptive analysis, sensory acceptability and expectation studies on biscuits with redused added salt and increased fiber. *Journal of Sensory Studies*, *24*(4), 498–511. https://doi.org/10.1111/j.1745-459x.2009.00223.x

Wan, X., Woods, A. T., van den Bosch, J. J. F., McKenzie, K. J., Velasco, C., & Spence, C. (2014). Cross-cultural differences in crossmodal correspondences between basic tastes and visual features. *Frontiers in Psychology*, *5*. https://doi.org/10.3389/fpsyg.2014.01365

Wong, R. M. M., Wong, S. C., & Ke, G. N. (2018). Exploring online and offline shopping motivational values in Malaysia. *Asia Pacific Journal of Marketing and Logistics*, *30*(2), 352–379. https://doi.org/10.1108/apjml-10-2016-0197

Woods, A. T., & Spence, C. (2016). Using Single Colors and Color Pairs to Communicate Basic Tastes. *I-Perception*, *7*(4), 204166951665881. https://doi.org/10.1177/2041669516658817

würzig – Wiktionary. (n.d.). Retrieved November 11, 2022, from https://de.wiktionary.org/wiki/w%C3%BCrzig

Appendix A: Demographics

Table 14 shows the distribution of age ($M = 2.85$, $SD = 1.67$), Table 15 shows the distribution of gender, and Table 16 shows the distribution of education.

Table 14

Distribution of Age

Rage	Age	Participants
1.	18-24	29.3%
2.	25-29	25.3%
3.	30-39	9.1%
4.	40-49	3.5%
5.	50+	32.8%

Table 15

Distribution of Gender

Gender	Participants
Male	37.9%
Female	59.0%
Non-binary	1.5%
Differently	0.5%
Preferred not to say	1.0%

Table 16

Distribution of Education

Education	Participants
High school (Middelbare school)	6.6%
Secondary vocational education (MBO)	9.1%
University of applied sciences (HBO)	50.0%
Academic university (WO)	33.8%

Appendix B: Survey

Informed consent

Beste deelnemer,

Allereerst hartelijk dank dat u wilt deelnemen aan dit onderzoek. Mijn naam is Nynke Reitsma en momenteel ben ik bezig met mijn scriptie voor de master Communication and Information Sciences aan Tilburg University. Voor mijn scriptie heb ik een experiment opgezet waarbij uw hulp van zeer toegevoegde waarde kan zijn. Voordat u start met het invullen van de enquête deel ik graag de volgende informatie.

Mocht u vragen en/of opmerkingen hebben met betrekking tot het onderzoek kunt u contact opnemen door een mail te sturen naar n.reitsma@tilburguniversity.edu.

Onderzoeksdoel

Het doel van dit onderzoek is om meer kennis te vergaren over cross-modale overeenkomsten (waarnemingen waarbij interactie plaatsvindt tussen twee of meer verschillende zintuigelijke modaliteiten).

Deelneming

Deelnemen aan dit onderzoek is geheel vrijwillig. U heeft recht om op elk moment van het experiment uw deelname te stoppen zonder gevolgen. Deelname aan het onderzoek duurt niet langer dan 10 minuten. Om een duidelijk beeld te krijgen van de steekproefgroep worden aan het einde van de enquête een aantal demografische vragen gesteld.

Vertrouwelijkheid

Uw antwoorden worden anoniem verzameld en vertrouwelijk opgeslagen. De gegevens zullen uitsluitend gebruikt worden voor onderzoeksdoeleinden en worden na 10 jaar definitief verwijderd.

Voordat u start met de enquête dient u akkoord te gaan met onderstaande punten:

- o Hierbij bevestig ik dat ik 18 jaar of ouder ben.

- o Hierbij bevestig ik dat ik de bovenstaande informatie volledig heb gelezen en een goed beeld heb bij het doel van het onderzoek.

- o Hierbij geef ik toestemming voor het anoniem verwerken van mijn antwoorden zoals benoemd in bovenstaande informatie.

- o Hierbij bevestig ik dat ik de mogelijkheid heb gehad vragen te stellen met betrekking tot het onderzoek zoals benoemd in bovenstaande informatie.

Elimination questions

Voordat u kunt deelnemen aan het experiment dient u een aantal controle vragen te beantwoorden. Drie vragen bepalen of u kunt deelnemen. Mocht u niet in aanmerking komen om deel te nemen, wordt u automatisch naar het einde van de enquête geleid.

1. Ik heb <u>geen</u> zichtproblemen (een bril of lenzen tellen niet als zichtproblemen)
- o Ik bevestig dat ik geen zichtproblemen heb
- o Ik heb wel zichtproblemen

2. Ik ben <u>niet</u> kleurenblind
- o Ik bevestig dat ik niet kleurenblind ben
- o Ik ben wel kleurenblind

Klik op het onderstaande geluidsfragment en beantwoord daarna de volgende vraag.

[Geluidsfragment](#)

3. Ik kan bovenstaande geluid goed horen

o Ik bevestig dat ik het geluid goed kan horen

o Ik kan het geluid niet goed horen

Start Experiment

Het experiment begint nu.

1. Hoe vaak koopt u een fles wijn?

o Minder dan één keer per maand

o Ongeveer één keer per maand

o Een paar keer per maand

o Ongeveer één keer per week

o Vaker dan één keer per week

Als u naar de volgende pagina gaat krijgt u vier keer een wijnfles te zien. Het is belangrijk dat u de afbeelding goed bestudeert en op het geluidsfragment eronder klikt en beluistert. Daarna kunt u per fles de vragen beantwoorden.

Condition 1

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

[Click here](#)

2. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

3. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o Zeer onwaarschijnlijk

o Onwaarschijnlijk

o   Enigszins onwaarschijnlijk

o   Neutraal

o   Enigszins waarschijnlijk

o   Waarschijnlijk

o   Zeer waarschijnlijk

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

4. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

	0	1	2	3	4	5	6	7	8	9	10
Fruitig											
Bloemig											
Droog											
Kruidig											
Zoet											
Houtig											
Aardachtig											
Melkachtig											

5. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o Zeer onwaarschijnlijk

o Onwaarschijnlijk

o Enigszins onwaarschijnlijk

o Neutraal

o Enigszins waarschijnlijk

o Waarschijnlijk

o Zeer waarschijnlijk

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze

webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de

wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

6. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

7. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

- o Zeer onwaarschijnlijk

- o Onwaarschijnlijk

- o Enigszins onwaarschijnlijk

- o Neutraal

- o Enigszins waarschijnlijk

- o Waarschijnlijk

- o Zeer waarschijnlijk

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

[Click here](#)

8. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

9. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o   Zeer onwaarschijnlijk

o   Onwaarschijnlijk

o   Enigszins onwaarschijnlijk

o   Neutraal

o   Enigszins waarschijnlijk

o   Waarschijnlijk

o   Zeer waarschijnlijk

Condition 2

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

2. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

3. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o Zeer onwaarschijnlijk

o Onwaarschijnlijk

o Enigszins onwaarschijnlijk

o Neutraal

o Enigszins waarschijnlijk

o Waarschijnlijk

o Zeer waarschijnlijk

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

4. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

5. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o Zeer onwaarschijnlijk

o Onwaarschijnlijk

o Enigszins onwaarschijnlijk

o Neutraal

o Enigszins waarschijnlijk

o Waarschijnlijk

o Zeer waarschijnlijk

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de

wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

6. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

7. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o Zeer onwaarschijnlijk

o Onwaarschijnlijk

o Enigszins onwaarschijnlijk

o Neutraal

o Enigszins waarschijnlijk

o Waarschijnlijk

o Zeer waarschijnlijk

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

8. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

9. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o Zeer onwaarschijnlijk

o Onwaarschijnlijk

o Enigszins onwaarschijnlijk

o Neutraal

o Enigszins waarschijnlijk

o Waarschijnlijk

o Zeer waarschijnlijk

Condition 3

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

2. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

3. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o Zeer onwaarschijnlijk

o Onwaarschijnlijk

o Enigszins onwaarschijnlijk

o Neutraal

o Enigszins waarschijnlijk

o Waarschijnlijk

o Zeer waarschijnlijk

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

4. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

5. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o   Zeer onwaarschijnlijk

o   Onwaarschijnlijk

o   Enigszins onwaarschijnlijk

o   Neutraal

o   Enigszins waarschijnlijk

o   Waarschijnlijk

o   Zeer waarschijnlijk

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze

webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de

wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

6. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

7. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o Zeer onwaarschijnlijk

o Onwaarschijnlijk

o Enigszins onwaarschijnlijk

o Neutraal

o Enigszins waarschijnlijk

o Waarschijnlijk

o Zeer waarschijnlijk

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

8. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

9. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o Zeer onwaarschijnlijk

o Onwaarschijnlijk

o Enigszins onwaarschijnlijk

o Neutraal

o Enigszins waarschijnlijk

o Waarschijnlijk

o Zeer waarschijnlijk

Condition 4

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

2. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

3. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o   Zeer onwaarschijnlijk

o   Onwaarschijnlijk

o   Enigszins onwaarschijnlijk

o   Neutraal

o   Enigszins waarschijnlijk

o   Waarschijnlijk

o   Zeer waarschijnlijk

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

4. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

5. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o   Zeer onwaarschijnlijk

o   Onwaarschijnlijk

o   Enigszins onwaarschijnlijk

o   Neutraal

o   Enigszins waarschijnlijk

o   Waarschijnlijk

o   Zeer waarschijnlijk

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de

wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

6. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

7. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

- o Zeer onwaarschijnlijk

- o Onwaarschijnlijk

- o Enigszins onwaarschijnlijk

- o Neutraal

- o Enigszins waarschijnlijk

- o Waarschijnlijk

- o Zeer waarschijnlijk

Probeer voor te stellen dat onderstaande wijnfles voorbijkomt in een online webshop. In deze webshop kun je luisteren naar een opname van het openen van deze fles. Bestudeer de wijnfles en luister naar het geluidsfragment. Beantwoord vervolgens de vragen onder de afbeelding.

Click here

8. Geef per onderstaande smaakaroma aan in hoeverre u deze smaak zou verwachten bij de wijn op bovenstaande afbeelding op een schaal van 1 tot 10.

9. Hoe waarschijnlijk is het dat u deze wijn zou kopen?

o Zeer onwaarschijnlijk

o Onwaarschijnlijk

o Enigszins onwaarschijnlijk

o Neutraal

o Enigszins waarschijnlijk

o Waarschijnlijk

o Zeer waarschijnlijk

Demographic questions

10. Met welk gender identificeert u zich?

o Man

o Vrouw

o Non-binair

o Anders

o Zeg ik liever niet

11. Wat is uw leeftijd?

o 18-24

o 25-29

o 30-39

o 40-49

o 50+

12. Wat is uw hoogst genoten opleiding?

o Middelbare school (VMBO, HAVO, VWO etc.)

o Middelbaar Beroeps Onderwijs (MBO)

o Hoger Beroeps Onderwijs (HBO)

o Wetenschappelijk Onderwijs (WO)

o Anders

Debriefing

Dit is het einde van de enquête. Bedankt voor uw deelname aan het onderzoek. Het doel van

het onderzoek is achterhalen wat cross-modale overeenkomsten zijn tussen kleur van een

wijnlabel en de smaakverwachting van de wijn en hoe geluid (doormiddel van een kurk of

een schroefdop) de sterkte van dit effect bepaalt. Vervolgens wordt er gekeken hoe deze

cross-modale interacties de aankoopintentie beïnvloeden.

In de enquête bent u willekeurig toegewezen aan één van de vier condities van dit

experiment. Bij het invullen van de enquête heeft u het geluid van het openmaken van een

fles met een schroefdop gehoord of het geluid van het openmaken van een fles met een kurk.

Ook was er verschil in de volgorde van de kleuren.

 Mocht u nog vragen en/of opmerkingen hebben betreft het onderzoek, kunt u contact

opnemen door een mail te sturen naar n.reitsma@tilburguniversity.edu.