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The Roles of Schema Incongruity and Expertise in Consumers' Wine Judgment

Abstract

Broadening the present understanding of how expertise moderates the schema-incongruity effect (i.e., the notion that a product that is moderately incongruent with the schema evoked for it in memory is associated with a comparatively positive product evaluation), this study argues that people with higher, not lower, degrees of expertise experience incongruity and prefer moderately incongruent products over congruent ones. Because people with low expertise in complex product categories lack a developed schema against which to assess encountered products, they will be insensitive to incongruity. People with high expertise, on the other hand, typically have developed schemata and can, therefore, perceive incongruity and respond accordingly.

Consumers with different levels of wine expertise participated in a study in which they were given congruent or incongruent information, as well as different levels of information elaboration, about a wine prior to tasting and evaluating it. The results of this study support the above argument: Expertise moderates the incongruity effect such that it is prevalent only for experts, and schema-level processing moderates expertise's moderating effect on the incongruity effect.

Keywords: schema incongruity, consumer expertise, complex product categories, wine

1. Introduction

Product liking in sensory analysis is connected to consumers' expectations or schema about the product. A common and empirically supported assumption is that products whose sensory qualities are congruent with consumers' expectations are evaluated more favorably than products exhibiting incongruent sensory qualities (Cardello 2003; Piqueras-Fiszman and Spence 2015). Recent results, however, suggest that products with incongruent qualities can be judged more favorably than products with congruent qualities (Silva et al. 2017). These later results are consistent with a stream of research that addresses the incongruity effect, i.e. the notion that a product that is moderately incongruent with the schema evoked for it in memory is associated with a comparatively positive evaluation (e.g., Meyers-Levy and Tybout, 1989; Noseworthy, Di Muro, and Murray, 2014). An important result from schema-incongruity research is that the incongruity effect is limited to novices (Peracchio and Tybout, 1996). For example, novices evaluated an iced, speckled, nutty cupcake-size cake more favorably when it was described prior to taste as a spicy cake (moderate incongruity) then when it was described as a high-calorie cake (congruity). For experts, this effect was not observed. The assumed reason for this is that experts have elaborate and flexible schematic structures that allow them to accommodate a discrepant stimulus and therefore deter incongruity from being perceived, whereas novices have less elaborate and flexible schemata.

Although a valid result in its domain or product category (cakes), the premise that novices actually employ schemata may not always hold. Cakes constitute a relatively simplistic product category in which most consumers have considerable experience. In more complex categories and in categories where consumers vary much in terms of experience, this premise is unlikely to hold. In complex product categories, people with limited experience (novices) would arguably have rudimentary schemata compared to consumer with extensive experience (experts). Without well-developed schemata, novices will not experience any incongruity, and the incongruity-effect is therefore not expected to occur. For experts, well-developed schemata exist and incongruity may therefore be experienced. Consequently, the incongruity effect is likely to occur for experts.

This research aims to test this hypothesis using wine as the focal complex product category. Specifically, this research investigates whether wine expertise moderates the incongruity effect, but with the presumption that consumers with higher degrees of wine expertise will experience incongruity and prefer moderately incongruent wines over congruent ones, while consumers with lower levels of expertise will not.

2. The Incongruity Effect and Expertise

Following the theorizing of Mandler (1982), several studies have examined the effects of schema congruity and incongruity on consumers' product evaluations (Carvalho, Samu, and Sivaramakrishnan 2011; Halkias et al. 2017; Jhang, Grant, and Campbell, 2012; Meyers-Levy and Tybout, 1989; Noseworthy, Di Muro, and Murray, 2014; Peracchio and Tybout, 1996; Stayman, Alden, and Smith, 1992). According to these studies, the very source of product evaluation is the consumer's perceived discrepancy between the product and the representation of it in memory (schema). The human memory can be viewed as a semantic network structure, called schema. Schemata allow us to make sense of, store, and respond to information we encounter in our environment (Anderson, 1988). When incoming information is easily organized into existing schemata, it can be said to be schema-congruent. For example, when a wine label states that the wine is *dry* (schema), and what you actually taste is a dry Riesling, with less than 2% of residual sugar, the incoming information (taste) is schema-congruent. On the contrary, when incoming information does not fit easily into existing schemata, the information is schema-incongruent. Information is schema-incongruent if, for example, the wine label states *dry*, but the tasted wine is a medium-sweet Riesling with 30 g/L of residual sugars.

Research on schema incongruity has suggested that congruity leads to mild positive product evaluation because of familiarity; moderate incongruity leads to positive evaluation because this incongruity is cognitively resolvable (Jhang, Grant, and Campbell, 2012) and therefore associated with arousal-based pleasure (Noseworthy, Di Muro, and Murray, 2014); and extreme incongruity leads to negative evaluation because it is not easily resolvable and therefore creates tension and discomfort (Mandler, 1982). In the wine example above, the medium-sweet Riesling accompanied by a label stating *dry* constitutes moderate incongruity, whereas a sweet, late-harvest Riesling with more than 45 g/L of residual sugar would constitutes extreme incongruity.

Although food research has suggested that high schema-congruity leads to more favorable food product evaluation than low schema-congruity (Adams et al. 2014; Lim, Fijimaru, and Linscott 2014), the outcome that moderate incongruity leads to even more favorable evaluation than high congruity has been observed for foods and beverages. Stayman, Alden and Smith (1992) found that consumers who held a soft drink schema in memory and actually tasted a drink that was a blend of 25 percent juice and 75 percent water (moderately incongruent) evaluated the drink more favorably than consumers who held a soft drink schema but actually tasted a 90 percent juice–10 percent water blend (strongly incongruent) or a 10 percent juice–90 percent water blend (strongly congruent). Analogous results were recently reported by Silva et al. (2017). In a study of expectations’ influence on liking of conventional and nonalcoholic beers, these researchers observed that nonalcoholic beers labeled incorrectly as beers received better taste ratings than nonalcoholic beers correctly labeled as nonalcoholic. Although these researchers attributed this incongruity effect to the name “beer” and how positive expectations associated with “beer” might override the sensory experience, their observation is also consistent with the incongruity effect.

2.1 Expertise

An important finding from schema-incongruity research is that expertise moderates the schema-incongruity effect (Kim, Hahn, and Yoon, 2015 Peracchio and Tybout, 1996). Schemata can be elaborate or unelaborate. Compared to unelaborate schemata, elaborate schemata have extensive content, include many levels of abstraction, and integrate many interrelationships between the different pieces of information (Alba and Hutchinson, 1987; Peracchio and Tybout, 1996; Sujan, 1985). People who are equipped with elaborate schemata in a specific category, known as experts (Chi, Feltovich, and Glaser, 1981), are rarely exposed to incongruity because most encountered stimuli will have a well-developed counterpart schema. To the extent that when incongruity actually occurs, experts can engage schemata rich enough to accommodate discrepant stimuli without much cognitive effort. Consequently, the arousal-based pleasure associated with resolving incongruity is unlikely to be experienced by experts. For people with unelaborate schemata, known as novices, the likelihood of encountering discrepant stimuli is larger, and their schemata are not extensive enough to automatically resolve this discrepancy when it occurs. They will, therefore, attempt to resolve the incongruity and, assuming that they succeed, will judge the incongruent stimulus more favorably, in line with the general prediction of the schema-incongruity effect. Based on these differences between elaborate and unelaborate schemata, Peracchio and Tybout (1996) hypothesized and empirically confirmed that moderate incongruity affected novices' product evaluations positively, but had no impact on experts' evaluations.

Although valid in certain product categories, the arguments that novices perceive incongruity and that experts accommodate incongruity automatically, and thereby circumvent the perception or feeling of incongruity, may not hold in other categories.

The incongruity effect is a schema-level phenomenon. An established schema is required for incongruity to emerge; otherwise, the stimulus has nothing to be incongruent *with*. Equipped with only under-developed or rudimentary schemata, novices are therefore unlikely to take notice of any discrepancy between schema and stimulus. Novices tend to focus on surface information, such as visible product attributes and single attributes, rather than integrated information and attribute interrelationships that characterize a schema (Gregan-Paxton and Roedder, 1997; McKeithen et al., 1981). Novices are likely to interpret information literally and in the order it is presented (Adelson, 1984; Alba and Hutchinson, 1987; Chi, Feltovich, and Glaser, 1981; Johnson and Russo, 1984; Maheswaran and Sternthal, 1990). Their knowledge representation may simply not contain enough relations to enable novices to recognize similarities between a base (schema) and a target (Gentner, Rattermann, and Forbus, 1993).

Consistent with this reasoning, observations in psychology and consumer research support the idea that novices are relatively insensitive to discrepancy of information from schema or other corrective feedback (Fiske, Kinder, and Larter, 1983; Kruger and Dunning, 1999; Sujan, 1985). Sujan (1985), for example, found that novices were less likely to respond to match versus mismatch between incoming product information and product category schemata in memory.

In light of the view that novices are less likely than experts to notice schema incongruity, how can Peracchio and Tybout's (1996) finding that the incongruity effect is prevalent for novices—

even confined to them—be explained? Research has shown that in simpler categories, individual differences in expertise tend to converge (Hunt, 2006). In Peracchio and Tybout's (1996) study the product category was relatively simple (i.e., desserts and cakes), such that both expert and novice participants were likely to have established product category schemata. In noncomplex categories, most people may establish schemata based on extensive experience alone (Ericsson and Lehmann, 1996). Therefore, it is likely that the novice participants in Peracchio and Tybout's (1996) study actually experienced incongruity.

Many categories are, however, complex and ill-defined. In wine-tasting, the number of winemakers, styles, vintages, regions, grape varieties, and modes of vinification make wine tasting a complex endeavor. Consequently, predicting and recognizing a set of particular sensory characteristics in a wine are arduous tasks. In the wine category, it is unlikely that anyone can develop schematic structures that are sophisticated enough to process incoming stimuli automatically. The ability to automatically process incoming stimuli develops slowly and requires much practice, as well as stimuli that do not vary much (Alba and Hutchinson, 1987).

Additionally, expertise comprises more than experience or familiarity (Alba and Hutchinson, 1987; Ericsson, Krampe, and Tesch-Römer, 1993; Ericsson and Lehmann, 1996). According to Ericsson and colleagues (Ericsson, Krampe, and Tesch-Römer, 1993; Ericsson and Lehmann, 1996), real expertise can be obtained only via deliberate and extensive training in a domain over time. Only up to a certain level will beginners be able to establish schemata and enhance their skills based on experience or domain familiarity alone. After this level, only those exposing themselves to deliberate training will develop their schemata further and continue to improve their skills. Some people may reach the level of sophistication that can be used to automatically accommodate new stimuli, but not all. In the wine domain, professional and scholarly training of experts and consumer wine-tasting courses facilitate the formation of higher levels of expertise. Several empirical studies have suggested that wine experts excel over novices in terms of cognitive and perceptual skills (Ballester et al., 2009 Hughson and Boakes, 2002; Lawless, 1984; Lehrer, 1983; Parr, Heatherbell, and White, 2002; Solomon 1990, 1997). The wine category is therefore likely to comprise both novices and experts in terms of variation in schemata development.

In summary, it can be argued that for complex product categories, such as wine, experts will have, through deliberate training and effort, acquired knowledge schemata (Ericsson, Krampe, and Tesch-Römer, 1993). These schemata are probably not sophisticated enough for automatic stimuli accommodation, but are nevertheless necessary for schema-level assessment of stimuli. In these domains, novices do not have, or have only rudimentary, schemata, and therefore lack the prerequisite for schema-level assessment of incoming stimuli. The prediction is therefore that in complex product categories the incongruity effect will be increasingly present for increased levels of expertise. This leads to Hypothesis 1,

H1: For complex product categories, product evaluation associated with incongruity is more favorable than evaluation associated with congruity for higher, but not for lower, levels of expertise.

Underlying Hypothesis 1 is the contention that experts use well-developed schemata to assess incoming stimuli information. Experts have acquired these schemata and have the capacity to use them. In other words, it is assumed that schema application is the cognitive mechanism that makes experts perceive schema incongruity and respond accordingly. To understand how schemata work to bring about this effect, it is useful to contrast piecemeal-based with schema-based processing of perceived sensory information.

2.2 Piecemeal-based versus Schema-based Evaluation

An incoming stimulus can be evaluated on the basis of the pieces (features or attributes) that make it up, or as a member of a particular stimulus category. A traditional view in consumer research has been that a product is perceived in terms of its discrete attributes, with each attribute having a distinct subjective value. The piecemeal-based evaluation of the product is then arrived at by combining (often by adding or averaging) the products' attributes according to some analytical rule (Sujan, 1985).

An alternative evaluation strategy is to recognize the product as a member of an established product category and evaluate it automatically based on this category's schema (Fiske and Pavelchack, 1986; Sujan, 1985). According to Mandler's (1982) account, evaluation arises from the structural congruity or incongruity between the stimulus and the schema representation of it in memory. The moderate incongruity effect occurs in the event that there is a moderate yet resolvable discrepancy between a product and its corresponding product schema in memory.

Consequently, for the incongruity effect to occur, an established category schema is required. If no schema can be retrieved, the stimulus must be evaluated on another basis, such as piece by piece using all attribute information (we do recognize the extensive line of research on heuristic-based evaluation). This leads to Hypothesis 2,

H2: For complex product categories, evaluation associated with incongruity is more favorable than evaluation associated with congruity when stimulus evaluation is based on a schema, whereas there will be no difference when the evaluation is based on piecemeal sensory information.

2.3 Expertise, Schema, and the Incongruity Effect

The relationship proposed in Hypothesis 2 also represents the explanation for why the incongruity effect is expected to be observed for experts and not novices (Hypothesis 1). If schema-based stimulus evaluation is the mechanism that makes experts perceive incongruity and novices not, conditions facilitating the use of that evaluation strategy should help novices perceive incongruity, meaning that the incongruity effect should be observed for novices as well as for experts. Under conditions that do not facilitate schema processing, novices are not provided with a basis for experiencing incongruity and should therefore not respond according to the general prediction of the incongruity hypothesis. Experts already have established schemata and should therefore be less helped by how information is structured. Regardless of whether new information is provided in terms of pieces or in terms of a schema, they should perceive incongruity and respond according to the incongruity hypothesis. This leads to Hypothesis 3,

H3: For lower levels of expertise, the incongruity effect occurs for schematic information, but not for piecemeal information. For higher levels of expertise, the incongruity effect occurs for both schematic and piecemeal information.

3. Materials and Methods

3.1 Participants

A total of 227 participants—135 women and 92 men—were recruited among inhabitants in a North American university town by means of flyers distributed in the local wine shop and other shops selling wine, as well as via a note in the local newspaper. Of the participants, 80 percent had a four-year college degree or higher education. In terms of age, 11 percent of the participants were in the age group 21–24, 39 percent were 25–34, 15 percent were 35–44, 17 percent were 45–54, 11 percent were 55–65, and 7 percent were 65 or over. None of the participants were recruited on the basis of their wine expertise, or lack thereof. Rather, participants' degrees of wine expertise were measured in the experiment by means of a wine-knowledge scale.

3.2 Wines

The two wines used in this study were from the same vineyard in Napa Valley, California, USA; they were from the same brand, made from Cabernet Sauvignon, stored in oak barrels, and from two different vintages. The focal wine, that was subject to participants' evaluation, was from 1999, and the test wine that was part of the manipulation was from 1998. The study took place in 2003, thus the wines that were evaluated were four and five years old at the time.

3.3 Design

The study used a three-factor (schema incongruity: incongruent vs. congruent) x (schema representation: schema vs. no-schema) x (expertise: degrees of wine knowledge) x between-subjects design.

Schema incongruity was manipulated by asking participants to form expectations about a wine based on a wine label and subsequently let them taste and smell the wine. In the congruent condition, the participants received a label that correctly specified the wine to be tasted whereas in the incongruent condition they received a label that incorrectly specified the wine. In this manipulation, wine labels (i.e. schema) rather than the tasted wine (i.e. stimulus) were varied. This was done to avoid that unanticipated sensory factors influenced the results. This research does not hypothesize anything with regard to the inverted U-shaped relationship between incongruity and evaluation per se, as this has already been established (e.g., Meyers-Levy and Tybout, 1989). Rather, the focus is on how an evaluation difference between congruent and incongruent stimuli is moderated by expertise. Consequently, the incongruity variable had two levels: incongruity versus congruity.

Shema representation was manipulated by providing the participants with either piecemeal only or both piecemeal and schematic information about the focal wine used in the study. The participants in the schema condition received extensive information about the wine's characteristics. For example, the longer the wine was stored in oak barrels, the more pronounced the flavor of oak in the wine would be. The Cabernet Sauvignon wine was also contrasted with the Zinfandel wine. In addition, participants in this condition received a graphic picture (cobweb plot) of the relative intensity of the wine's main sensory characteristics, to help them imagine how the wine would taste when forming their expectations prior to tasting (see Appendix). In the no-schema condition, participants did not receive this extensive information.

A post hoc manipulation check was conducted in 2015 to verify that the schema manipulation worked as intended. If the schema condition equips participants with more knowledge than the no-schema condition, as a result of the more extensive and elaborate information the former condition comprises, participants in the schema condition should be better than participants in the no-schema condition at identify correct wine characteristics. Forty-seven participants were randomly assigned to the two schema-conditions. Participants were a mix of consumers intercepted in the same town as was the main sample (n = 28) and consumers recruited from Amazon's crowdsourcing platform Mechanical Turk (n = 19). All participants were randomly assigned to one of the two schema-conditions. After having completed the involved reading tasks, they were given a list of ten wine characteristics from the information they had just read and asked to check as many correct characteristics as they thought fit. Results from an ANCOVA—with the number of correct characteristics as the dependent measure, schema condition as an independent factor, and time spent to complete the task as a covariate—show that of a total of six correct characteristics, participants in the schema condition (n = 22) checked more than did participants in the no-schema condition (n = 25) (M_{schema} = 4.41 vs. $M_{no\text{-}schema}$ = 3.36, F(1, 44) = 4.59, p = .038). No difference was observed for incorrect characteristics (M_{schema} = 1.2 vs. $M_{no\text{-}schema}$ = 1.1, F(1, 44) = .16, p = .69). Taken together, these results suggested that the schema and no-schema conditions differed as intended.

Expertise was not manipulated, but captured by measuring the participants' objective knowledge. Expertise develops over time and is not easily manipulated within the constraints of a laboratory experiment. Hence, a measure is an ecologically better account than manipulation (Sujan, 1985). Notwithstanding this advantage, a measure does not capture expertise as such. Experts' exceptional schemata are best captured by selecting these experts according to recognized credentials (Shanteau, 1992; Spence and Brucks, 1997). Unfortunately, samples of credential-based experts are difficult to obtain in sufficient sizes. This study therefore capitalized on relationships discovered in previous wine research. Wine knowledge has been found to be positively associated with wine involvement (Cox, 2009), and wine involvement, in turn, is positively associated with frequency of wine consumption (Rahman and Reynolds, 2015). These relationships were supported by Goldsmith and d'Hauteville (1998), who found that those who consume wine frequently (labeled heavy consumers) are both more involved in and more knowledgeable (subjective and objective knowledge) about wine. Consequently, consumers with high levels of wine knowledge are likely to have consumed wine more often and, in this capacity, are more likely to have established expertise schemata than consumers with low levels of wine knowledge.

Consumer expertise or knowledge is not unidimensional. In addition to objective knowledge, which is the focused dimension in the present research, consumers have subjective beliefs about their own knowledge (Alba and Hutchinson, 2000). Objective and subjective knowledge are often correlated. Subjective knowledge was therefore measured as a covariate.

3.4 Procedure

The experimental sessions took place during evenings in an enology sensory laboratory at a university. The participants had earlier signed up for a time and date during which they could attend, and the actual testing time lasted from 30 to 45 minutes. Participants were randomly assigned to the four conditions of the manipulated variables (incongruent vs. congruent x schema vs. no-schema) in groups varying in size from 2 to 24. Participants conducted the experimental tasks individually. The four conditions were randomly distributed over sessions and evenings.

The test was performed in a room dedicated to wine tasting at the university. The room had desks with wall dividers, so that each participant had privacy when performing their tasks.

First, all participants received a glass (12 oz. wine tasting glass) of wine from a test wine (Grape: Cabernet Sauvignon, Vintage: 1998, Region: Napa Valley, Barreled: Stored in Oak barrels for 20 months), along with information about this wine's grape, vintage, region, sensory qualities (i.e., visual appearance, aroma, and taste), and barrel aging. This exercise was included to familiarize participants with connecting verbal and sensory wine information (see Fig .1).

Second, participants were randomly assigned to the four experimental conditions. One quarter of the participants were assigned to the schema condition and given elaborate wine characteristics information and a wine label that was congruent (Grape: Cabernet Sauvignon, Vintage: 1999, Region: Napa Valley, Barreled: Old oak barrels) with the wine they were about to taste. Another quarter was assigned to the same schema condition, but given a wine label that was incongruent (Grape: Zinfandel, Vintage: 1994, Region: Napa Valley) with the wine to be tasted. A third quarter was assigned to the no-schema condition and given a wine label that was congruent (Grape: Cabernet Sauvignon, Vintage: 1999, Region: Napa Valley, Barreled: Old oak barrels) with the wine to be tasted. The fourth quarter was assigned to the no-schema condition and given a wine label that was incongruent (Grape: Zinfandel, Vintage: 1994, Region: Napa Valley) with the subsequently tasted wine. In their respective conditions, participants were asked to rate the extent to which they expected to like the wine and to describe the wine's expected aroma and taste, using their own words. Third, all participants were given a glass of the actual wine (Grape: Cabernet Sauvignon, Vintage: 1999, Region: Napa Valley, Barreled: Old oak barrels) for sensory inspection and asked to rate their actual liking, as well as describe the wine's actual aroma and taste in their own words. Participants were then also asked to rate the extent to which they perceived the wine to be congruent or incongruent with their expectations.

Finally, the participants completed a quiz designed to measure their objective wine knowledge, responded to two questions that measured subjective knowledge, and provided demographic information about themselves. After the experiment, the participants received a small gift as a token of gratitude for being part of the study.

[Insert Figure 1 about here]

3.5 Measurement

3.5.1 Expertise

A 20-item quiz-type scale (with three answer alternatives) that captured objective knowledge of wine aspects including grape varieties, sensory characteristics, wine-making procedures, and wine–food combinations (see Supplementary Material), was used as a measure of expertise. The individual participants' number of correct answers to the questionnaire was used as a measure of their degree of objective wine knowledge. Thus, the scale varied from a minimum score of 0 to a maximum score of 20 correct answers. Scores closer to 0 were considered to represent low degrees of objective wine knowledge and scores closer to 20 were considered to correspond to high degrees of objective knowledge. The distribution of correct quiz answers in the analyzed sample approached a normal distribution.

The expertise scale was developed uniquely for the present study. A post hoc validation test (2017) of the scale was therefore administered to a known group of experts (people whose profession is winemaking or wine tasting) and novices (people who reported themselves to have no expertise in wine). Experts answered on average 17.37 questions correctly (standard deviation = 1.30; n = 19 participants) and novices answered on average 8.96 questions correctly (standard deviation = 2.92; n = 25 participants; t = 11.67, p = .00). These results confirm the assumption that scores to the objective wine knowledge quiz provided a proxy measure of participant's' degree of wine expertise.

3.5.2 Liking and perceived incongruity

Participants rated their actual and expected liking on two nine-point, one-item like/dislike scales. Perceived incongruity was measured by asking participants to rate on a one-item, five-point scale how much better than expected (+2) or how much worse than expected (-2) they perceived the wine to be.

3.5.3 Open responses

Open responses were collected to obtain a richer picture of participants' experience with the wine in the experiment. These responses were not related to any of the hypotheses. Participants were asked to write down any descriptors of aroma, flavor, taste and mouthfeel, to describe the expected and actual taste of the wine, using their own words. The participants' descriptions based on their actual smelling and tasting of the wine, were later classified by using the Wine Aroma Wheel (Noble et al., 1984) as a guide. The third tier of the Wine Aroma Wheel contains more detailed descriptors (e.g., blackberry, blackcurrant) than the first (e.g., fruity) and second (e.g., berry) tiers. Only descriptors that could be coded according to this wheel (i.e. aroma descriptors) were considered for further analysis.

3.5.4 Subjective knowledge

Participants were asked to assess, on a 10-point scale, their knowledge of wine as closer to that of a novice (1) or closer to that of an expert (10). In addition, participants were asked to assess the average person's knowledge of wine on the same novice/expert 10-point scale. This projective measure was included because people tend to overestimate their own expertise (Alba and Hutchinson, 2000).

3.5.5 Analyzes

Because two of the hypotheses involved a metrically scaled moderator variable, a regression-based approach (PROCESS; Hayes, 2013) that avoids dichotomization of the moderator was chosen to analyze the data (see, e.g., Fitzsimons [2008] for advocacy of this approach).

4. Results

4.1 Manipulation Check

Results from an ANOVA—with perceived incongruity as a dependent measure, and schema incongruity and schema representation as manipulated dichotomous factors—indicated that the participants' (in the main sample) perceived incongruity varied as expected. The schema incongruity–schema representation interaction was statistically significant (F(1, 222) = 4.497, p = .041). Together with the specific observations (Fig. 2) that difference in perceived incongruity across the congruent and incongruent conditions was significant for participants in the schema condition ($\text{Contrast}_{\text{schema}}$: $M_{\text{incongruent}}$ = .100, $M_{\text{congruent}}$ = -.317, p =. 029), but not for participants in the no-schema condition ($\text{Contrast}_{\text{no-schema}}$: $M_{\text{incongruent}}$ = -.293, $M_{\text{congruent}}$ = -.143, p = .457; F(2,

222) = 3.14), this interaction effect evidences that the manipulations worked properly for the experimental participants.

Moreover, the perceived incongruity values in the incongruent condition differed from the extreme values for both the schema ($M_{\text{perceived incongruity}}$ = .10 < 2, t = -12.69, .10 > - 2, t = 14.02), and the no-schema participants ($M_{\text{perceived incongruity}}$ = -.29 < 2, t = -17.02, -.29 > - 2, t = 12.67). This suggests that the incongruity was moderate, not extreme.

[Insert Figure 2 about here]

4.2 Test of Hypotheses

To test Hypothesis 1, actual sensory liking was regressed on the manipulated dichotomous factor schema incongruity and the measured metric factor expertise. Subjective and projected knowledge served as covariates. The regression model had an acceptable fit (R^2 = .09, F(5, 208) = 3.9, p = .002). A significant main effect of schema incongruity on liking was observed ($\beta_{\text{incongruity}}$ = .72, SE = .26, t = 2.76, p = .003 [one tailed]). No particular effect on liking from expertise was hypothesized. This main effect was also not significant ($\beta_{\text{expertise}}$ = - .029, SE = .04, t = - .69, p = .25 [one tailed]).

Supporting Hypothesis 1, the interaction effect of incongruity and expertise on actual liking was significant ($\beta_{\text{incongruity x expertise}}$ = .129, SE = .07, t = 1.74, p = .041 [one tailed]). To probe this interaction, the Johnson-Neyman (JN) technique was applied (see Fig. 3). The JN-technique derives the values of expertise such that the ratio of the conditional effect (i.e. the difference in means between the incongruent and congruent condition) to its standard error is exactly equal to critical t-value associated with p = .05 (Hayes 2013, p. 240). Along the continuum of values for expertise the difference in means between incongruent and congruent condition will shift between statistically significant and not significant. The region of significant difference starts at expertise = 8.37 correct answers on the quiz. For participants with an expertise score equal to or higher than 8.37, the schema-incongruity effect is significant. For participants with expertise levels lower than 8.37, the incongruity effect is not significant. Higher levels of expertise were thus associated with the incongruity effect, whereas lower levels were not. For further illustration, Table 1 displays the means for the congruent and incongruity conditions at different values of expertise, both within and outside the region of significance.

Expected liking means were not significantly different across schema incongruity conditions at any of levels of expertise (see Table 1). Hence, the effects on actual liking can be attributed to the variables that varied in the experiment.

4.3 Auxiliary Analyses

The participants' aroma descriptions based on their actual smelling and tasting of the wine were analyzed to cast light on the relationship between their sensory experience and expertise. It was expected that experts would be able to use more descriptors from the detailed third tier than would novices. It was further expected that there would be smaller differences between experts and novices regarding the first- and second-tier descriptors, because these tiers contain more general descriptors. Regression analyses with numbers of third-tier aroma descriptors based on participants' smelling of the wine as a dependent variable and expertise as the independent variable revealed a positive relationship ($\beta_{expertise}$ = .28, SE = .03, t = 4.44, p = .00 [one tailed]). The relationship between expertise and number of first-/second-tier aroma descriptors was not significant ($\beta_{expertise}$ = -.04, SE = .01, t = -.56, p = .23 [one tailed]).

[Insert Figure 3 about here]

To test Hypothesis 2, actual sensory liking was regressed on the manipulated dichotomous factors schema incongruity and schema representation. The fit of the regression model was acceptable (R^2 = .04, F(3, 223) = 2.9, p = .037). A significant main effect of schema incongruity on liking was observed ($\beta_{incongruity}$ = .547, SE = .26, t = 2.13, p = .017). No particular effect on liking from schema representation was hypothesized, and this main effect was also not significant ($\beta_{schema\ representation}$ = -.034, SE = .26, t = -.13, p = .448).

Supporting Hypothesis 2, the interaction effect of incongruity and schema representation was significant ($\beta_{incongruity\ x\ schema\ representation}$ = 1.03, SE = .52, t = 2.00, p = .023 [one tailed]). Further analysis (see Fig. 4 and Table 1) revealed that the schema-incongruity effect appeared for participants in the schema condition ($\hat{Y}_{incongruent}$ = 6.12, $\hat{Y}_{congruent}$ = 5.08), but not for participants in the no-schema condition ($\hat{Y}_{incongruent}$ = 5.66, $\hat{Y}_{congruent}$ = 5.65). The condition that facilitated the use of schema-based evaluation was associated with the congruity effect, whereas the condition that did not facilitate the use of a schema was not. Expected liking means were the same for all cells in the experiment (Table 1). Therefore, the effects reported for actual liking were most likely produced by the manipulated variables.

[Insert Figure 4 about here]

In the regression used to test Hypothesis 3, actual sensory liking was a dependent measure, schema incongruity and schema representation were manipulated dichotomous factors, and expertise was a measured metric factor. Subjective and projected knowledge were covariates. The regression model's fit was acceptable fit (R^2 = .12, F(9, 204) = 3.0, p = .003). The three-way interaction of incongruity, expertise, and schema representation on liking was significant ($\beta_{incongruity\ x\ expertise}$ = -.260, SE = 15, t = -1.737, p = .042 [one tailed]). The JN-technique was applied to probe this interaction (see Fig. 5). The interaction between incongruity and schema changes from statically significant and not significant at expertise equals to 9.14 correct quiz-answers. Below this expertise level there is a significant two-way interaction between incongruity and schema representation. This means that the incongruity effect occurs for participants in the schema condition, but not for participants in the no-schema condition below this expertise level. For example, Table 1 shows that at the 25^{th} expertise percentile (which corresponds to 8 correct answers), there is a difference in liking between incongruent and congruent wine label for the schema condition (6.17 vs. 5.05, t = 2.77), but not for the no-schema condition (5.74 vs. 5.97, t = -.53). At and above the expertise level of 9.14, schema representation does not moderate the effect of incongruity on wine-liking. For example, at the 75^{th} expertise-percentile (which corresponds to 12 correct answers) there is a difference in liking between the incongruent and congruent conditions, both for the schema (6.14 vs. 5.06, t = 2.44) and the non-schema (5.98 vs. 5.21, t = 1.71) conditions. Taken together, these results support Hypothesis 3. The incongruity effect is moderated by schema representation for lower, but not for higher levels of expertise.

The expected liking means were largely equal across schema incongruity conditions for all levels of expertise (Table 1). The effects on actual liking can, therefore, be attributed to the variables that were manipulated in the experiment.

[Insert Figure 5 about here]

[Insert Table 1 about here]

5. Discussion

The results of this study suggest that in complex domains, such as wine, expertise moderates the incongruity effect, but differently from what has been found in noncomplex domains. Contrary to previous findings, the results here demonstrate the incongruity effect for consumers with high degrees, but not for consumers with low degrees of expertise.

In sensory research, a common assumption is that sensory experiences that confirm consumers' expectations lead to more favorable food product evaluations than disconfirming experiences. The results of the present study suggest that this line of thinking can be expanded. Moreover, the results reported here provide an alternative explanation to Silva et al.'s (2017) account that incongruent food experiences are preferred to congruent ones because expectations may override the incongruent experience.

The significant interaction between incongruity, expertise, and schema supports the idea that experts' use of established schemata is key to understanding why expertise moderates the incongruity effect. The incongruity effect was present when schema processing was facilitated, regardless of expertise level, but in the absence of such facilitation, the effect was only present for higher levels of expertise. This result suggests that the incongruity effect is a schema-level phenomenon that should not be expected when piecemeal processing of stimuli information is likely.

It can be speculated that an inverted U-shaped relationship between the moderate incongruity effect and expertise reconciles the current results and those of Peracchio and Tybout

(1996). For extremely low levels of expertise (i.e., novices) there is no incongruity effect because no schema is developed to assess (in)congruent stimuli. For moderate levels of expertise, a developed schema to assess (in)congruent stimuli exists, and therefore an accompanying incongruity effect exists also. For extremely high levels of expertise, the schema structure is so extensively developed that incongruity is resolved without much cognitive effort and with no incongruity effect as a result. In the domain of desserts, most people have developed at least some schema structure—hence Peracchio and Tybout's (1996) finding that the incongruity effect occurs for novices. In the wine domain, few people have developed schematic structures that are extensive enough to automatically resolve incongruity—hence the finding that experts can face incongruity and display the incongruity effect. Future research should, therefore, investigate whether the incongruity effect disappears among experts with the highest level of expertise in their complex domain.

From the findings reported in this research, we know that the incongruity effect holds for consumers with high degrees, but not for consumers with low degrees of expertise. This means that educating consumers to become experts in a product category, or target existing expert segments, would be a clever strategy for companies launching new and/or incongruent products in complex domains. Moreover, this strategy recommendation is quite opposite from that suggested for product launches in simplistic domains—i.e., avoid educating consumers, or target novice segments.

6. Limitations

In this research, expertise was captured using a measure of objective knowledge, rather than via the more valid approach of selecting expert participants by means of credentials

(Shanteau 1992; Spence and Brucks 1997). A measured variable might have limited validity as it is likely to share variance with other unmeasured variables. Therefore, the reported effects of expertise on actual liking may have been confounded with effects of variables such as wine interest or task involvement. Future research should therefore use credentials to recruit experts and nonexperts.

Schema representation was manipulated by providing participants with elaborate and structured information. On the surface, this manipulation appears to have been successful. A manipulation check suggested that schema-level participants held more relevant information in memory than no-schema participants. In addition, expected liking was the same for both levels of schema representation, whereas actual liking differed in the hypothesized directions. Hence, the effects on actual liking can be attributed to manipulated differences in schema representation. Nevertheless, the effects produced by differences in schema representation may not be enduring. A schema takes time to alter, and the more expertise a person possesses, the more resistant to change his or her schemata are. Therefore, the observed effects on wine liking might have been more a result of temporal expectations than of changes in well-established schemata.

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FIGURES

FIGURE 1

DIAGRAM OF DESIGN AND PROCEDURE

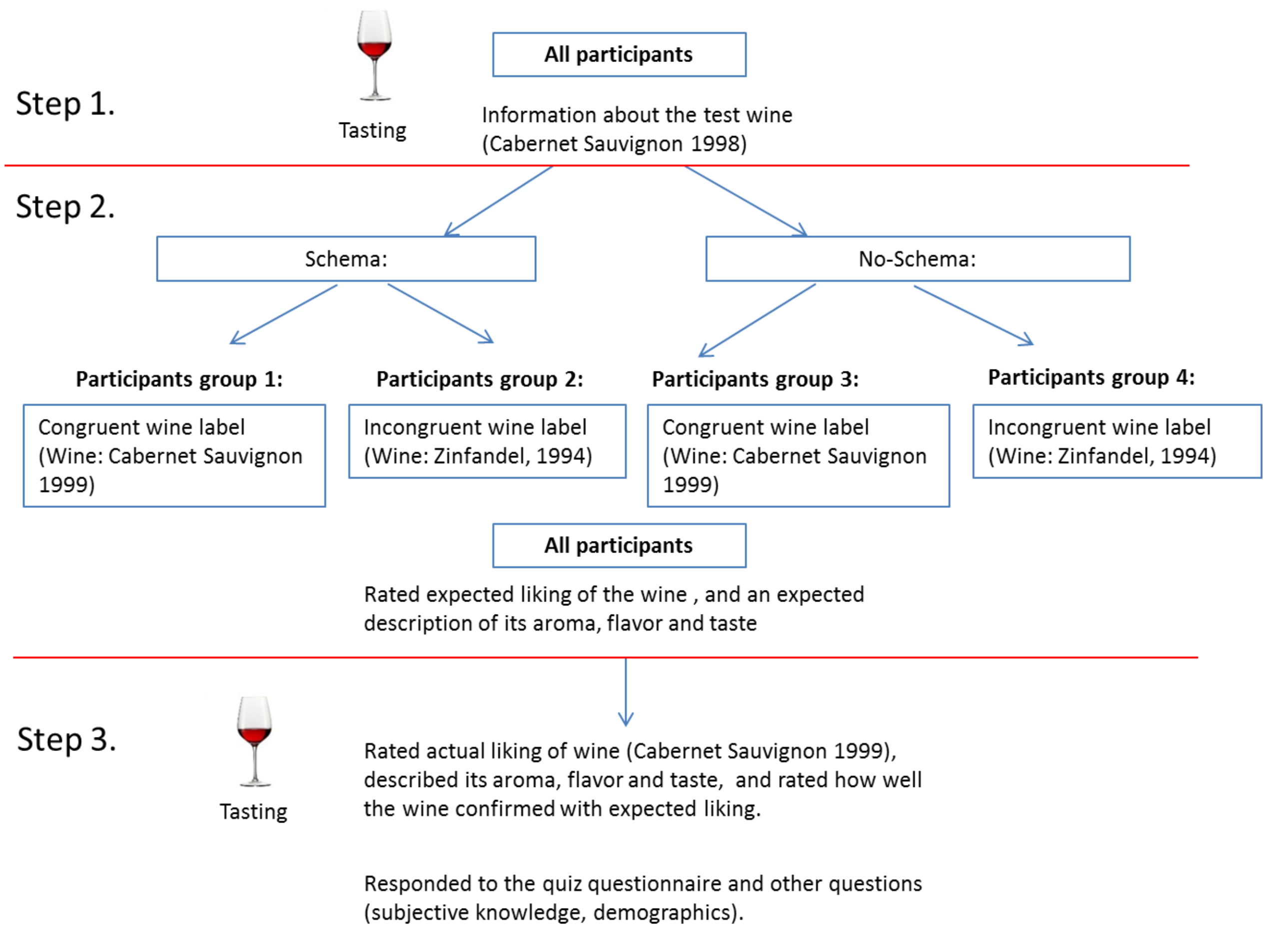
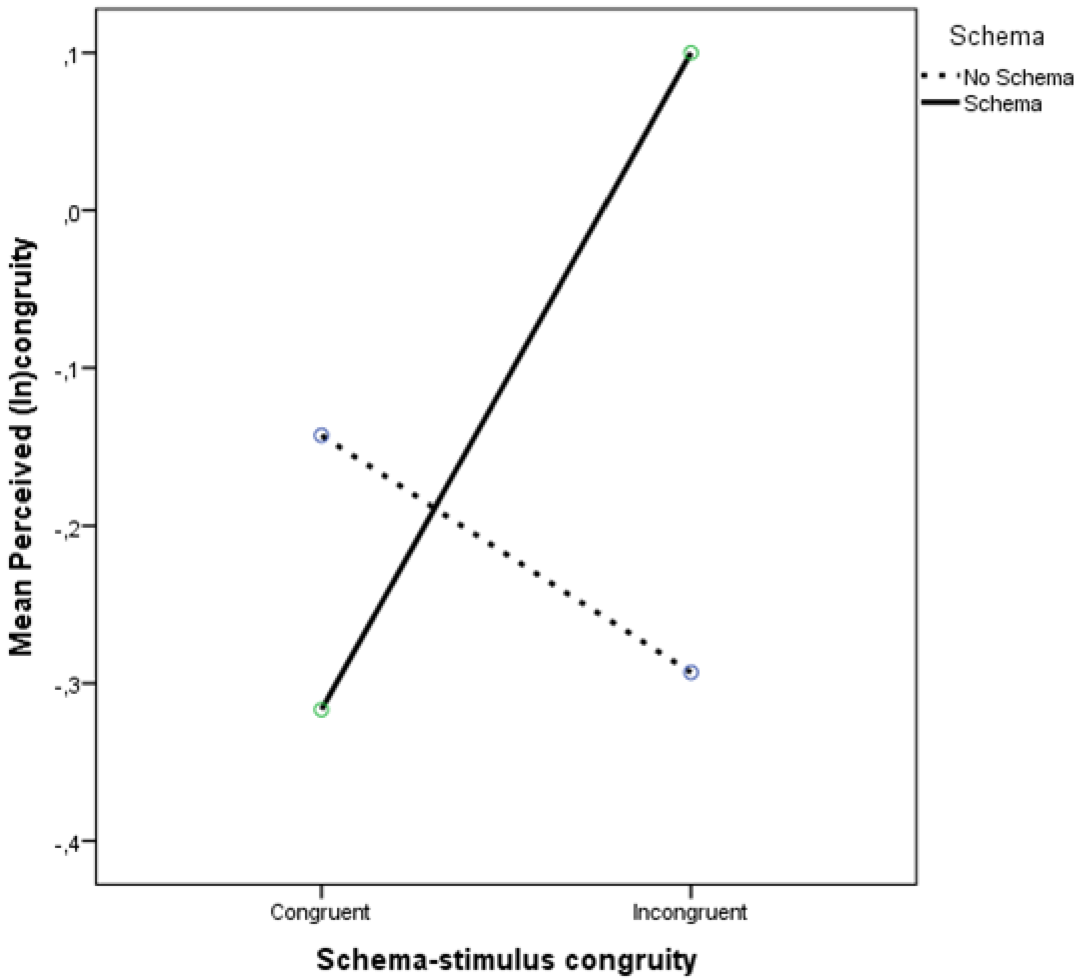


FIGURE 2

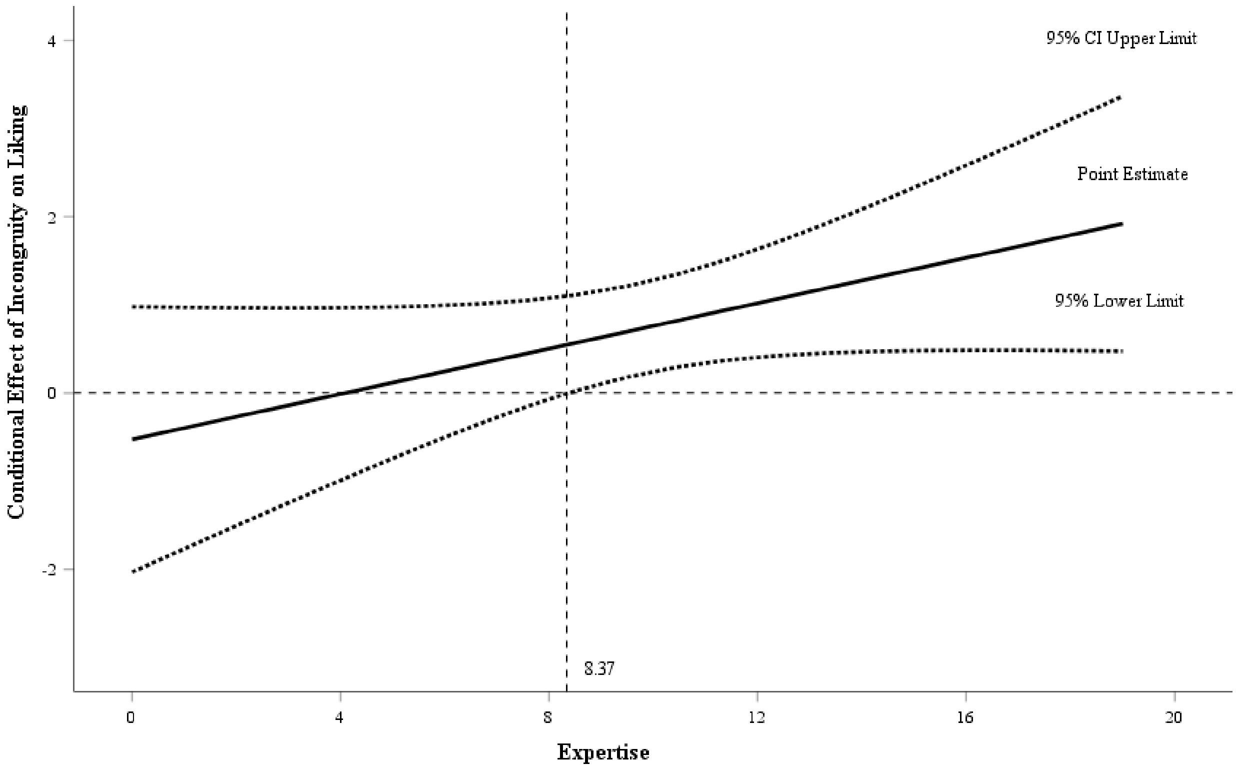
PERCEIVED IN(CONGRUITY) OF WINE IN SCHEMA AND NO-SCHEMA CONDITIONS BY INCONGRUENT AND CONGRUENT WINE LABEL



Notes: Perceived incongruity = a five-points scale anchored with "much better than expected (+ 2)" and "much worse than expected (- 2)." Congruent = information that correspond to the wine label, incongruent = information that does not correspond to the wine label. Schema = elaborated wine characteristics information; No-Schema = no elaborated wine characteristics information.

FIGURE 3

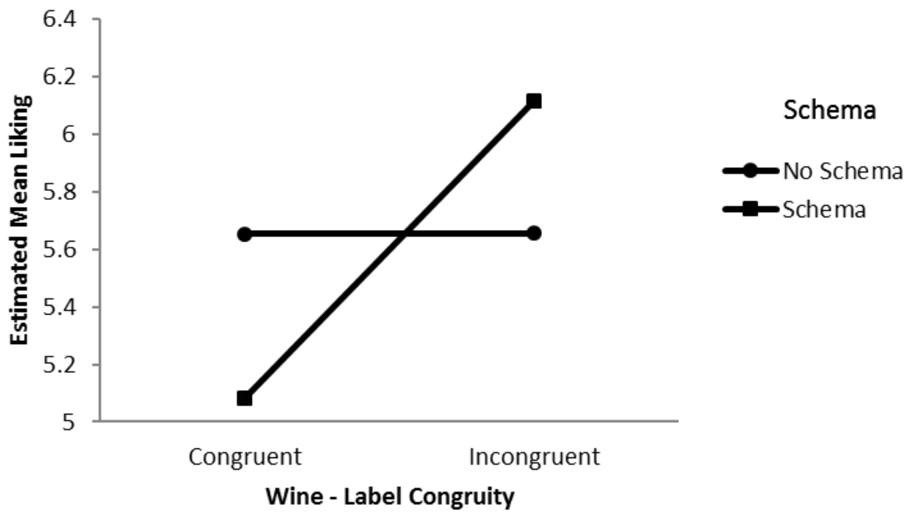
THE CONDITIONAL EFFECT OF CONGRUENT VS. INCONGRUENT WINE LABEL ON SENSORY LIKING OF WINE AS A FUNCTION OF EXPERTISE



Note: The Y-axis shows the difference in means on the liking scale between the incongruent and congruent condition (i.e. the incongruity effect). Liking = a hedonic 9-point scale, anchored with 'dislike very much' and 'like very much.' Expertise: Ranges from 0 to 20 correct answers on a quiz. At or above 8.37 correct answers the incongruity effect is significant. Below 8.37 this effect is not significant. The solid line represents point estimates for the incongruity effect. The dotted lines represent the upper and lower limits of the confidence interval for this effect.

FIGURE 4

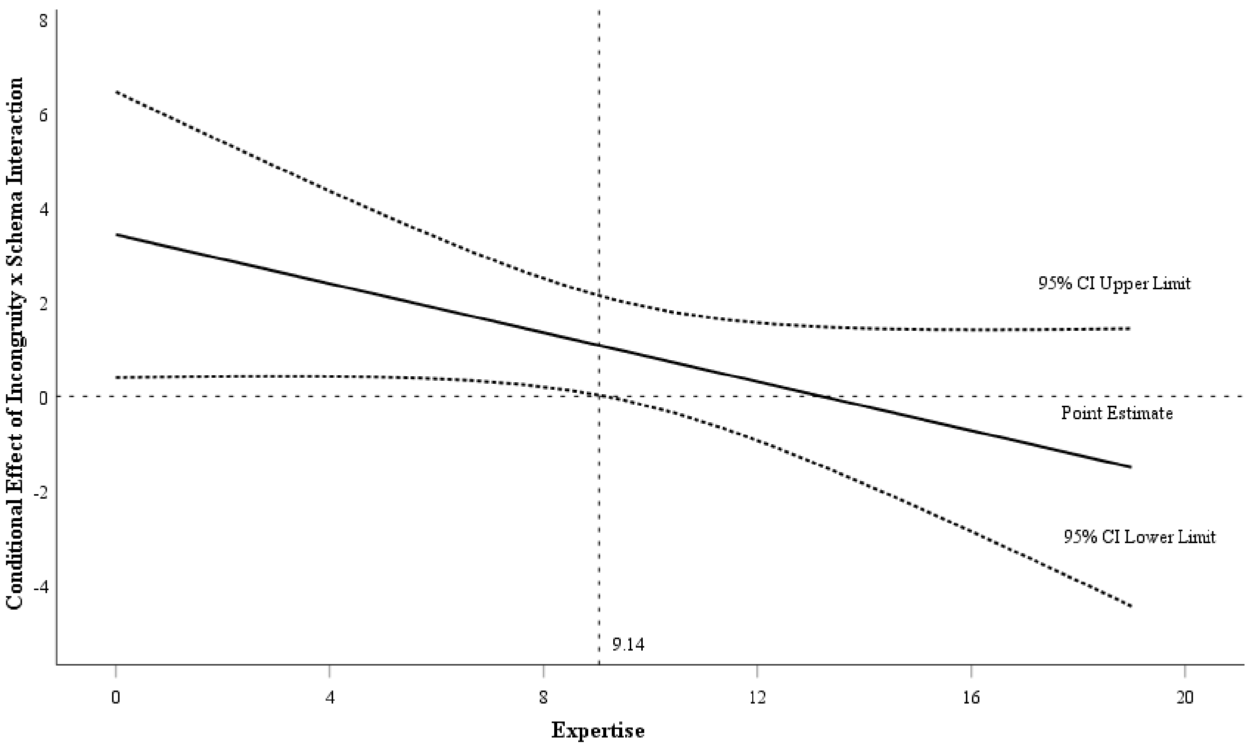
SCHEMA VERSUS NO-SCHEMA-BASED SENSORY LIKING OF WINE BY INCONGRUENT AND CONGRUENT WINE LABEL



Note: Liking = a hedonic 9-point scale, anchored with ‘dislike very much’ and ‘like very much’. Congruent = information that corresponds to the wine label, incongruent = information that does not correspond to the wine label. Schema = elaborated wine characteristics information; No-Schema = no elaborated wine characteristics information.

FIGURE 5

THE CONDITIONAL EFFECT OF CONGRUENT VS. INCONGRUENT WINE LABEL X SCHEMA VS. NO-SCHEMA INFORMATION ON SENSORY LIKING OF WINE AS A FUNCTION OF EXPERTISE



Note: The Y-axis shows the two-way interaction effect between incongruity and schema-representation on liking (i.e. the moderation of the incongruity effect). Liking = a hedonic 9-point scale, anchored with ‘dislike very much’ and ‘like very much.’ Expertise: Ranges from 0 to 20 correct answers on a quiz. At or above 9.14 correct answers the interaction effect is not significant. Below 9.14 the interaction effect is significant. The solid line represents point estimates for the interaction effect. The dotted lines represent the upper and lower limits of the confidence interval for this interaction effect.

TABLE 1

SUMMARY OF MEANS BY EXPERIMENTAL CONDITION

	Actual Wine Liking			Expected Wine Liking		
Descriptors	Mean	SE	t-value	Mean	SE	t-value
H1: Incongruity x Expertise						
10th Expertise Percentile						
Incongruent	5.80	.37		6.48	.31	
Congruent	5.81	.37	-.02	6.06	.31	.99
25th Expertise Percentile						
Incongruent	5.93	.20		6.41	.17	
Congruent	5.43	.21	1.73*	6.15	.18	1.03
50th Expertise Percentile						
Incongruent	6.00	.18		6.38	.15	
Congruent	5.24	.19	2.90**	6.20	.16	.78
75th Expertise Percentile						
Incongruent	6.06	.22		6.34	.19	
Congruent	5.05	.23	3.28**	6.25	.19	.35
90th Expertise Percentile						
Incongruent	6.13	.30		6.31	.25	
Congruent	4.85	.31	3.11**	6.30	.26	.03

H2: Incongruity x Schema						
Schema						
Incongruent	6.12	.25		6.32	.21	
Congruent	5.08	.25	2.93**	6.10	.21	.72
No-Schema						
Incongruent	5.66	.25		6.43	.22	
Congruent	5.65	.27	.01	6.25	.24	.58
H3: Incongruity x Schema x Expertise						
10th Expertise Percentile						
Schema						
Incongruent	6.20	.58		6.52	.53	
Congruent	5.04	.53	1.61	5.55	.49	1.39
No-schema						
Incongruent	5.50	.47		6.42	.41	
Congruent	6.73	.52	-1.76*	6.48	.36	-.14
25th Expertise Percentile						
Schema						
Incongruent	6.17	.31		6.37	.29	
Congruent	5.05	.28	2.77**	6.06	.26	.76

No-schema						
Incongruent	5.74	.27		6.47	.21	
Congruent	5.97	.32	-.53	6.29	.25	.52
50th Expertise Percentile						
Schema						
Incongruent	6.15	.26		6.30	.24	
Congruent	5.06	.27	3.04**	6.31	.25	-.10
No-schema						
Incongruent	5.86	.26		6.49	.20	
Congruent	5.59	.27	-.71	6.20	.21	.97
75th Expertise Percentile						
Schema						
Incongruent	6.14	.30		6.23	.27	
Congruent	5.06	.36	2.44**	6.56	.33	-.86
No-schema						
Incongruent	5.98	.33		6.51	.26	
Congruent	5.21	.30	1.71*	6.11	.23	1.18
90th Expertise Percentile						
Schema						
Incongruent	6.12	.40		6.15	.37	
Congruent	5.06	.50	1.78*	6.81	.46	-1.22

No-schema						
Incongruent	6.10	.45		6.54	.35	
Congruent	4.83	.39	2.18**	6.01	.30	1.19

Notes: * = p <. 05. ** = p <. 01. 10th means the 10th percentile which corresponds to 4 correct quiz-answers. Further, the 25th percentile corresponds to 8 correct answers, the 50th percentile corresponds to 10 correct answers, the 75th percentile corresponds to 12 correct answers, and the 90th percentile corresponds to 14 correct answers.

APPENDIX

MANIPULATION OF WINE SCHEMA

"No-schema" condition

The wine:

Grape: 100% Cabernet Sauvignon

Region: Napa

Vintage: 1998

The wine has been stored in oak barrels where 37% of the barrels were new. The wine was stored for 20 months in the barrels. It is a reserva.

Description:

The color: Is dark red with brown hints on the side

The aroma: complex:

Dark and light berries (black berry, cherry, raspberry),

Spices, like clove

Sweet notes of chocolate, vanilla, butter and cedar

Taste: rich, relatively low acidity

Berries,

Vanilla, bell pepper

Tannins are soft on the palate

Bitter substances can also be noted

<u>About Cabernet Sauvignon in Napa:</u>

Because of differences in micro-climates, and winemaker personalities, wines from this grape can vary greatly.

Cabernet Sauvignon is a grape with strong character. The wines are often dry and very tannic when young. The aging time in the oak barrel is as important as the aging time in the bottle. The most common descriptors of Cabernet Sauvignon include black berry, raspberry, black currant (cassis), bell pepper, olives, eucalyptus, oak, and soy.

“Schema” condition

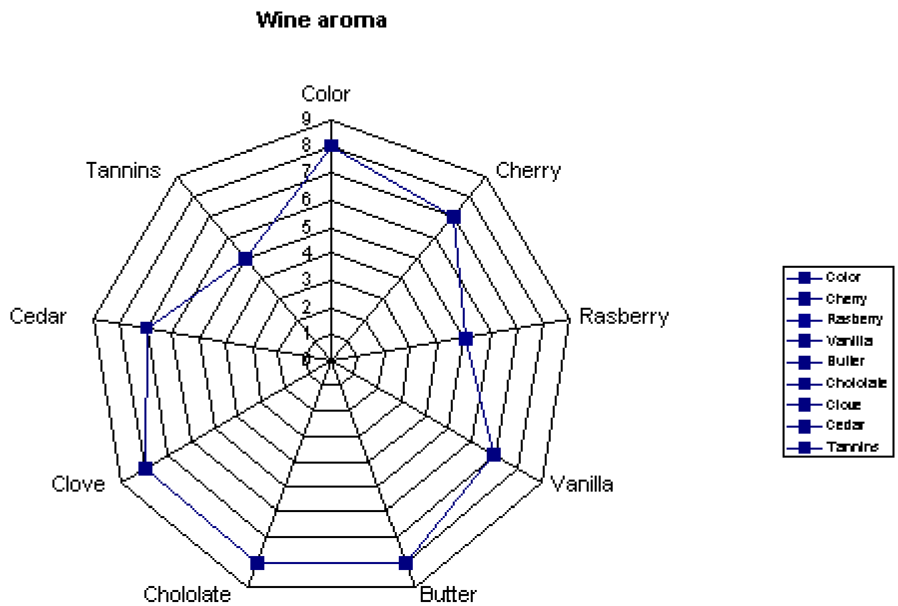
Participants in the “schema” condition read the same text as in the “no-schema” condition described over, and in addition the following text:

The dark red color: Is typical for Cabernet Sauvignon. Other grapes give lighter Wines. Zinfandel is for example lighter and has a more transparent color. The color changes during aging from red to more brownish. This happens when the color particles (anthocyanins) precipitate when combining with other particles in the wine over time.

Oak contributes to: The vanilla aroma and taste
Oak wood characters
Cedar aroma

It allows the wine to breathe more during aging compared to wines stored in stainless steel tanks. New barrels contribute to stronger oak wood characters.

The wine aroma:



The cobweb can be read like a nine-point scale, with zero intensity (0) in the center and high intensity (9) at the outer ring. The intensity of the typical characteristics of this wine is described on each scale.

MANIPULATION CHECK OF SCHEMA

Which of the following aromas can you expect to sense in a Cabernet Sauvignon wine (check all the ones that you expect)?

- ☐ Cherry
- ☐ Raspberry
- ☐ Vanilla
- ☐ Butter
- ☐ Chocolate
- ☐ Clove
- ☐ Cheddar
- ☐ Caramel
- ☐ Fruit
- ☐ Coffee