Food and Wine Pairing: The Effect of Education and Test Repetition on Hedonic and Intensity Ratings

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Introduction
This study considered the under-researched areas of:
- perceived hedonic ratings for food and wine matches and mismatches,
- intensity ratings of wine elements,
- and the impact of an education program on these ratings.

Purpose:
- assess the differences in hedonic pairing ratings for food and wine combinations using two wines and two food items.
- investigate the impact of food and wine education on perception of match (hedonic ratings) and intensity ratings of wine elements.

Background
- Food and wine pairing “rules” are abundant in popular literature.
- A small amount of empirical studies have been published in peer-reviewed journals on the subject of food and wine pairing (Harrington et al., 2010; Harrington & Hammond, 2006; Nygren et al., 2001; Pettigrew & Charters, 2006).
- Studies on the impact of food and wine education have been even more limited.
- Most research to date has focused on wine education in general rather than the study of the impact on food and wine appreciation or match perceptions (Taylor et al., 2008).

Wine Evaluation
- Much has been written and studied in regards to wine and its characteristics.
- Little research has been done to assess the impact of wine characteristics when consumed with food.

Wine Education
- Research exploring the relationship between education/ training on match perceptions and wine or food evaluation is lacking.
- This area is important for the development of the wine industry marketplace and to ensure efficient and effective education processes resulting in the largest impact.
Several classic matches between food and wine are apparent in industry nomenclature. The scant empirical studies completed to date provide some support for the recommended pairings of industry experts (Bastian et al., 2009; Harrington et al., 2010).

A review of the small number of food and wine studies reveal that regardless of the tasting method (mixed, sequential or both) the combination of wine and food can bring about not only attribute suppression but also enhancement.

There appears to be a high level of variance for intensity perceptions in food elements, wine elements and perceived level of match among participants in all studies.

Research Questions

- When classic food and wine marriages are compared to non-marriages, is the hedonic relationship higher across a diverse group of individuals?
- Does education on food and wine impact hedonic ratings of food and wine match?
- Does completion of a 16 week food and wine education program impact intensity ratings for key wine elements such as tannin, sweetness level and acidity level?

Methodology

Purposeful selection to create two comparable groups.

Class Group = students enrolled in food and wine university course.

Non-class Group = student volunteers that were not enrolled.

Thirty-two (23 females and 9 males) students with an age range between 21 and 33 years (mean age ± standard deviation = 23 ± 3 years) participated in this experiment.

All participants were assessed for no clinical history of major disease and no impairment in smell and taste perceptions.

Participants provided information on

1. whether or not they drink wine,
2. wine consumption frequency,
3. liking levels for red, white and rosé wines.

Experimental Design

Two wines and two food items were selected to create two good matches and two mismatches.

The two wines were Ruby Port (RP) and Sauvignon Blanc (SB); the two food items were dark chocolate and goat cheese.

Classic matches = RP combined with dark chocolate and SB combined with goat cheese.

Mismatches = RP with goat cheese and SB with dark chocolate (Harrington, 2008).

A Likert-type 9-point scale was used to assess intensities and hedonic responses.

To investigate the effects of “wine item”, “food item”, and “test session” on sensory intensity and hedonic response, 3-way repeated measures analyses of variance (RM-ANOVAs) were used.

Post hoc Bonferroni t-tests were performed if significant differences in were determined.
Results - Sensory attribute and hedonic responses (Class Group)

• One significant difference for intensity ratings (first vs. second tests). Tannin level of wines were rated significantly higher in the first session.
• Wine comparisons = Intensity ratings of flavor, sweetness, and tannin level were significantly different between RP and SB.
• No significant differences between RP and SB for dryness, sourness, and wine liking.
• No significant difference in the hedonic responses between two wines or two food items.
• Tannin level = significant interactions between “test session” and “wine item”.
• Participants differentiated the tannin level between RP and SB in the second session more clearly than in the first session.

Results - Sensory attribute and hedonic responses (Non-class Group)

• No significant difference for intensity ratings of sensory attributes between the first and second sessions.
• Wine comparisons = Intensity ratings of wine flavor, sweetness, and dryness were significantly different between RP and SB.
• The hedonic ratings were significantly different between two food items, but not between wines. That is, non-class participants liked chocolate more than goat cheese.
• No significant interactions between “test session” and “wine item”, “test session” and “food item”, and “wine item” and “food item”.

Results - Matching pair of wine and food items

This results were consistent within and between groups for the both test sessions.

Class group
• Significant interaction between wine and food items for match perception.
• Participants matched RP with chocolate more strongly than with goat cheese, whereas SB with goat cheese was a stronger match.

Non-Class group
• Significant interaction between wine and food items for matching pair of wine and food items.
• Here again, participants matched RP with chocolate more strongly and paired SB with goat cheese more strongly.

Discussion and Conclusions

• Demonstrated strong match differences among wine and food pairings.
• Hedonic differences were consistent with earlier articulated expectations based on anecdotal evidence.
• This finding was consistent across groups and test repetition:
  √ Demonstrates relationships for both novice and more expert consumers.
• Two significant differences were apparent for education effects.
  √ Wine tannin intensity rating effects with the education treatment.
  √ The class rated the SB and goat cheese match higher in the post-education period, indicating some learning effects of food and wine matching
    √ Is this primarily based on greater familiarity with these food/wine items?
    And/or a socialization effect?
Implications (1)

- Wine evaluation and intensity ratings.
  - Class and non-class participants were able to consistently identify the key wine components of sweetness and sourness in the wines.
  - Thus, regardless of training, consumers should be able to identify intensity of these basic wine characteristics.

- Wine tannin and astringency.
  - Education and training appears to be important for consumers to identify/articulate tannin and astringency in wine.
  - Supports the value of systematic wine training for increasing appreciation of wine and impacting wine purchasing decisions.

- Supported the notion that many food and wine combinations create a sensation of match and mismatch for consumers regardless of experience.
  - The two match examples used in this study were very straightforward and low complexity.

Implications (2)

- SB is dry, tart and herbaceous; goat cheese is tangy and pungent.
- These characteristics are likely to require familiarity and experience.
- The importance of food and wine experience as a contributor to appreciation of less familiar items (e.g., Taylor et al., 2008).
- Knowledge of consumers’ experience is an important consideration for restaurants to add value.
- Wine staff trained to identify consumer experience levels can be an effective tool.
- Wine staff might utilize less complex pairings to enhance interest for less experienced guests.
- More complex experiences can be co-created for more experienced.
- A core element of co-creation is a continuous dialogue (before, during and after the service); the primary value driven by the process of the service delivery rather than the product itself (Chathoth, et al. 2013).

- Thus, this concept of service and the resulting value seems appropriate for wine service and food and wine interactions.

Future Research

- The lack of statistical significance may be a function of a small sample size.
- Future research should extent this research using a larger sample and additional wine and food combinations (e.g., more complex food and elements - the impact of aroma, fattiness in food/tannin relationship, etc.).
- Research stream would benefit from a greater understanding of participant characteristics on perceptions of match or mismatch.
  - Is match driven by the participant liking level of the food or wine? Or, are there other key drivers of match perception for consumers?
- Further studies should also consider the impact of training/education on the ability to:
  - predict match/mismatch for food and wine combinations,
  - articulate the impact of food and wine elements on match perceptions,
  - and predict food matches based on key elements with a variety of beverages (beer, tea, coffee, soda, etc.).