


Response Time for Concepts: Does it Add Information to Acceptance?

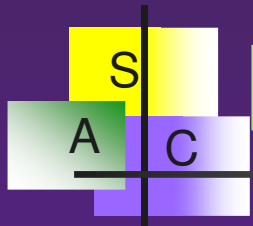


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Edgar Chambers, Ph.D.

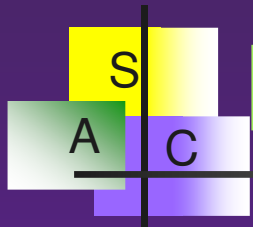
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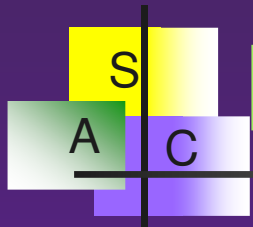
Background

- Companies often use preference or acceptance scores to decide which new products or reformulated products will enter the market.
- What happens when products or concept score the same for acceptability or preference?
- Lipner (2007) indicated that the “first 5 seconds are critical” – the amount of time it takes to grab consumers’ interest



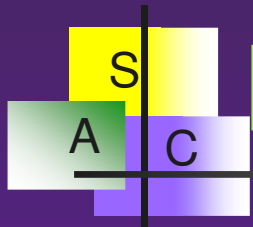
Background

- 1914 Potter et al. found that it took a shorter amount of time to make a decision about the liking of a color, the more the color was either liked or disliked
- Dashiell (1937) and Shipley et al. (1945) found that the more colors were different from each other, the quicker the preference decision was made
- 1989, Hovancik conducted similar research using computer technology and found the same relationship



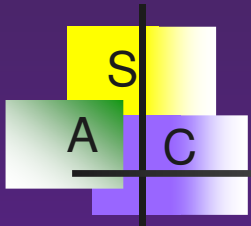
Background

- McWhinnie (1993) showed (using a Van Gogh painting) that an intervening variable (1.5 hrs of art education) had no effect on the preference, but lowered response time
- Moskowitz et al. (2001) found that if you give the consumer sensory-based concept information regarding credit card offers, that this helped reduce response time
- Petrusic and Baranski (2001) found that when making judgments of confidence in decisions, response time did not correlate with the difficulty of the decision



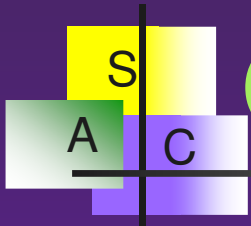
Background

- Moskowitz (2003) found that response times varied among segments of the population who liked different types of grapefruit juice
- Those studies would suggest that the two factors, acceptance and response time may be measurably different uncorrelated variables.
- The amount of time it takes for a consumer to respond or decide on the acceptance of a product or concept may be an important piece of additional information for decision making.



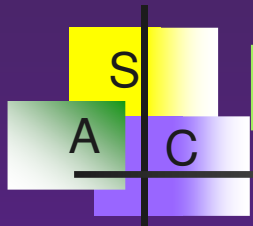
Objective

- To determine if a relationship exists between acceptance scores and the amount of time it takes a respondent to make give the scores (i.e. make a decision and enter a score) – with and without tasting a product



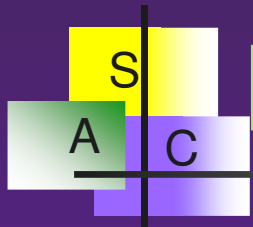
General Research Plan

- Consumers evaluated concepts for frankfurters with and without tasting products using computers to record acceptance scores.
- The computer tracked time from the concept appearing on screen and the consumer making a decision and entering a score.



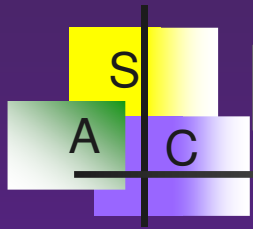
Materials and Methods

- Consumers
 - 96 (1/3 male and 2/3 female)
 - 18 and over
 - Recruited by telephone
 - Metropolitan New York/Westchester County
 - Must have eaten a frankfurter in the past month
 - Testing was conducted in a central location



Materials and Methods

- Concepts categories and elements
 - 5 categories
 - Ingredients, Health/nutrition, Sensory, Size, and Convenience
 - Elements within each category
- Categories and elements were determined through focus groups
- Consumers evaluated concepts both with and without frankfurters present



Example of Concept

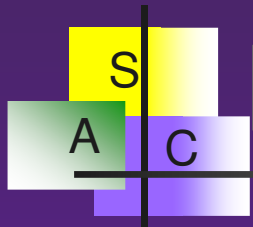
Beef Frank

Juicy

5-minute meal

Jumbo

Score _____



Example of Concept

Turkey Frank

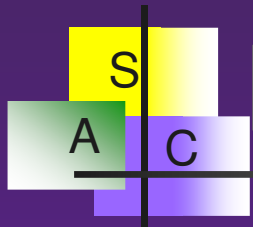
Firm

85 % Fat Free

5-minute meal

Bun Length

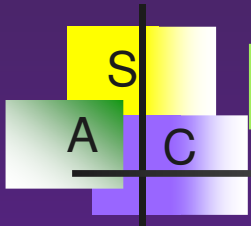
Score _____



Example of Concept

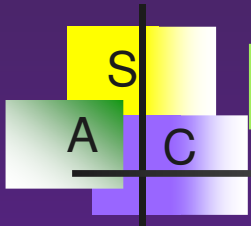
**Meat Frank –
No Filler**

Score _____



Materials and Methods

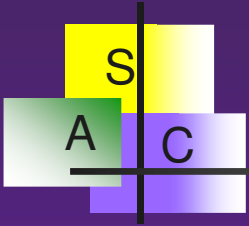
- Consumers were given an explanation of concept testing and practiced scoring concepts by evaluating a set of non-meat related concepts.
- Consumers viewed each concept on the computer screen and directly entered the acceptance score
- Response time, the elapsed time from when the concept appeared on the screen to the time when a consumer entered a score, was recorded by the computer



Materials and Methods

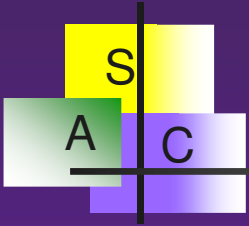
- Fractional factorial design
 - 160 concepts
 - 16 concepts evaluated first without product present
 - 16 concepts evaluated with each of 10 different frankfurter product
 - Each consumer saw all 160 concepts

Materials and Methods – Time Index



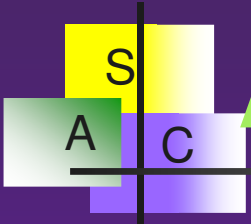
- Is it important to index the time or should it be used “raw”
 - Slightly more than 40% of the variation in response time was dependent on number of words in the concept (correlation: $r=0.65$)
 - The use of “raw” data would be heavily dependent on the number of words
 - Issue of whether response time is independent of liking should not be impacted by number of words.

Materials and Methods – Time Index

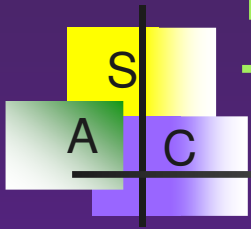


- Time index was created to have a response score that was independent from the number of words on the concept
 - Divided the response time in seconds by the number of words in the concept and multiplied by 100.
 - Used in subsequent analysis

Materials and Methods – Data Analysis



- Correlation coefficients for actual time and acceptance scores were calculated
- Acceptance scores were transformed logarithmically and by computing a simple distance from the center (or neutral) point on the scale.
- Time Index and acceptance scores were analyzed by ANOVA
- Time Index mean values were computed for each concept and were used in the calculation of the main effects and two-way interactions.



Results - Relationship of Response Time and Overall Liking of Concepts

- Correlations between acceptance scores and response time were low
 - Concepts without frankfurter, $r=0.21$
 - Concepts with frankfurter, $r=0.41$
- Transformation of the data did not improve the relationship



Results - Time Effects With and Without Products

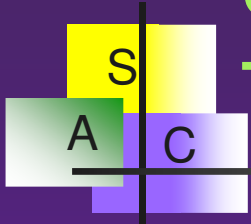
- Overall - Time index (response time) for acceptance decisions was significant for many more main effects and interactions than was the acceptance score



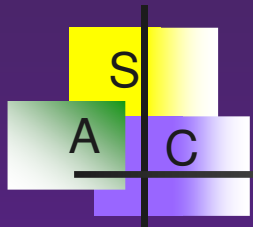
Results - Time Effects With and Without Products

- Concepts evaluated without a frankfurter present
 - Response time was significant for all main effects and half the interactions
 - Acceptance score was significant for only 2 main effects
- Concepts evaluated with frankfurter present
 - Response time was significant for all main effects and all interactions
 - Acceptance score was significant for 4 main effects and 2 interactions

Significant Main Effects for Response Time and Overall Liking



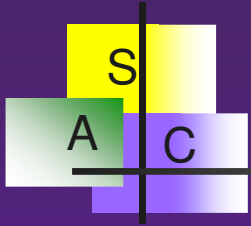
Concept Categories	Concept Only		Concept with Frankfurters Present	
	Response Time	Liking Score	Response Time	Liking Score
Meat	***	***	***	***
Health	***	***	***	***
Sensory	**	NS	**	***
Convenience	***	NS	***	***
Size	***	NS	***	NS
Meat x Health	***	NS	***	*
Meat x Sensory	NS	NS	***	NS
Meat x Convenience	**	NS	***	NS
Meat x Size	NS	NS	***	NS
Health x Sensory	**	NS	***	NS
Health x Convenience	***	NS	***	NS
Health x Size	*	NS	***	*
Sensory x Convenience	NS	NS	**	NS
Sensory x Size	NS	NS	*	NS
Convenience x Size	NS	NS	***	NS



Results

- Concept categories affect response time more than they affect overall liking scores.
- Response time adds additional information to that already provided by the acceptance score
- Response time changes even when acceptance may not

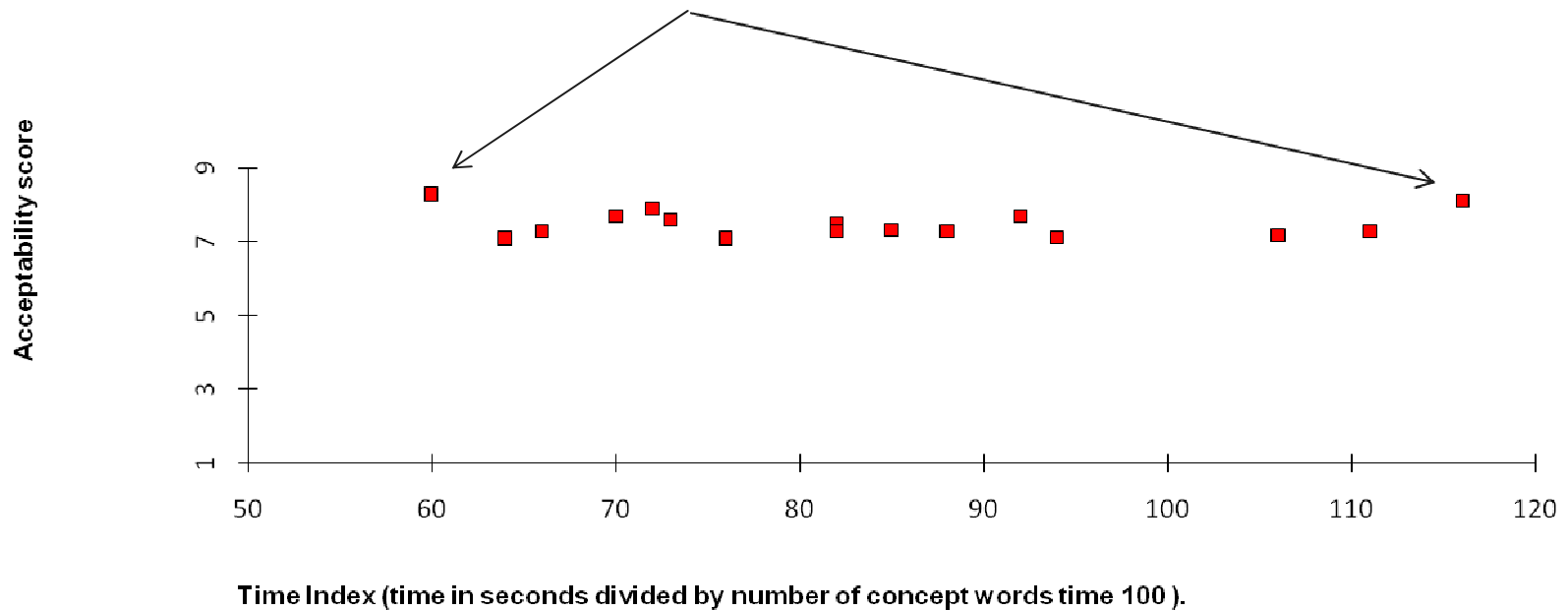
Results – A different way of examining the data



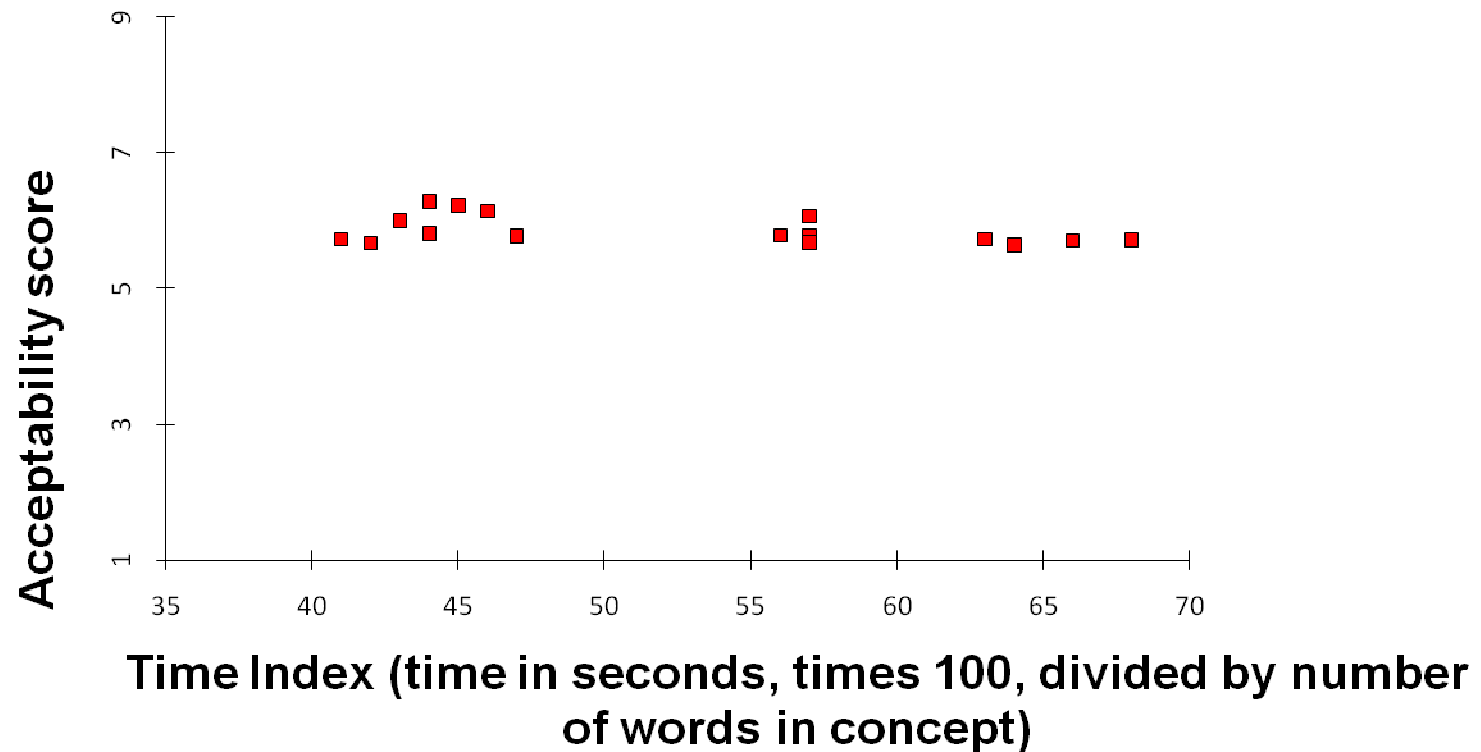
- Comparison of response time for equal acceptance scores
 - Means for the top 16 scoring concepts were not significantly different for acceptance, both when seen without a frankfurter and with a frankfurter
 - Response time index varied greatly.

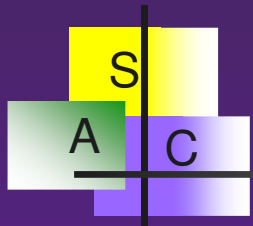
Mean Response Time Index vs. Acceptability Score for the Top 10% of Concepts when Concepts were Evaluated Alone

The top two scoring concepts (numerically) are at opposite ends of the response time index



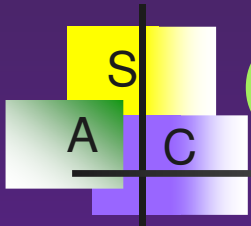
Mean Response Time Index vs. Acceptability Score for the Top 10% of Concepts when Concepts were Evaluated With Products





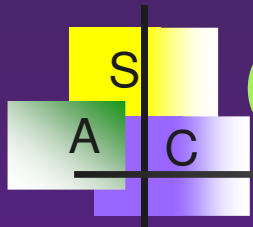
Implications

- If two concepts score equally high, but one concept evokes a quicker response, it would seem that the concept with the shortest response time should be selected.



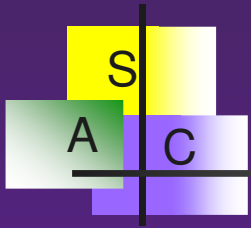
Conclusions

- Response time does not correlate well with acceptance scores of products (concepts)
- Response time may provide additional information for product and market researchers
- Response time appears to be more sensitive than acceptance scores to changes in attributes of concepts
- Response time for concepts that received similar liking scores varied by as much as 100%, indicating that some concepts may have a more immediate impact on consumers



Conclusions

- Additional research is needed to determine if the response time has an impact on subsequent product choice



Questions ??