

This is the accepted version of the following article: Woodside, Arch G. 2012.  
Consumer Evaluations of Competing Brands: Perceptual versus Predictive Validity.  
Psychology & Marketing. 29 (6): pp. 458-466, which has been published in final form  
at <http://doi.org/10.1002/mar.20534>

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Perceptual versus Predictive Validity**

Pre-publication version of reference:

Arch G. Woodside (2012), Consumer Evaluations of Competing Brands:  
Perceptual versus Predictive Validity, *Psychology & Marketing*, 29 (6): 458–466.

Acknowledgement: The author appreciates the insightful comments of reviewers and Carol M. Megehee, Coastal Carolina University, and Rajan Natarajan, Auburn University, of earlier drafts of this paper. Send correspondence to Arch G. Woodside, Boston College, Carroll School of Management, Department of Marketing, 140 Commonwealth Avenue, Chestnut Hill, MA 02467; telephone: +1-617-552-3069; fax: +1-617-552-6677 (email: arch.woodside@bc.edu).



## **Abstract**

This study applies the concepts of consumer predictive and confidence values of information to consumer evaluations of food quality. Examining hypothetical findings from a thought experiment, the study offers advances in cue utilization, predictive validity, and achievement of consumer's perceived quality and actual quality. Separately, metrics for these concepts were applied in a consumer product-quality evaluation study of three brands of peanut butter. Actual quality was operationally defined in terms of Consumers Union ratings of the peanut butter. Using a between-groups, post-test only experimental design, graduate, female, education students (n = 98) tasted and rated one of three peanut butters on the basis of quality and nine product attributes. These informants received no knowledge of brand names or comparative qualities prior to the test. The analysis indicates a non-significant correlation between actual quality of the brands and quality as perceived by the informants. The major cues used by informants in making their qualitative judgments (cue utilization) differed from the significant dimensions associated with actual quality (predictive validity). The findings inform the suggestion for consumer training in the process of making accurate quality evaluations.

Keywords: predictive value, confidence value, Brunswik lens model, food, peanut butter

## **Consumer Evaluations of Competing Brands: Perceptual versus Predictive Validity**

### **INTRODUCTION**

This article proposes advances in cue utilization theory that builds on prior (e.g., Cox 1973; Fishbein & Ajzen, 1975) and recent findings (e.g., Shiv, Cannon, & Ariely, 2005) on how product-service intrinsic and extrinsic cues affect consumer quality evaluations and consumers' performance outcomes. Using a between-group food-tasting experiment, the article reports a study that tests the relevancy of Brunswik's (1955, 1956) lens model to consumer quality judgments of brands within a product category that vary on objective quality levels.

The findings of the experiment support core tenants of cue utilization theory—consumer judgments of cues intrinsic to the product were most predictive of objective product quality while consumer judgments of cues extrinsic to the product were most predictive of perceived product quality. Along with supporting core tenants of theory, the findings have practical implications for training programs to enable consumers to make brand quality judgments that closely match objective measures of brand quality as well as for brand marketing strategies.

The paper has the following organization. Following the introduction, section two describes cue utilization theory in consumer psychology. Section three applies Brunswik's lens model for the relationships of consumers' cue judgments to objective quality and to perceived brand quality judgments among competing brands. Section four describes the method for a between-groups true post-test only tasting experiment to test the model. Section five presents the

findings of the experiment. Section six concludes with a discussion of how the findings advance theory and offers limitations and practical implications.

## **CUE UTILIZATION THEORY**

Cue utilization theory is the generally accepted account of how consumers arrive at quality judgments (Sprott & Shimp, 2004). This theory proposes that consumers base overall perceived quality of a product, service, or brand on both intrinsic cues (e.g., ingredients) and extrinsic cues unrelated to the product's performance capabilities per se (e.g., price, brand name, packaging). Zeithaml (1988) proposes that intrinsic cues dominate extrinsic cues in influencing consumer perceptions of quality when intrinsic cues can be evaluated with high confidence at the time of purchase. However, for store brand grocery items Richardson, Dick, and Jain (1994) report that extrinsic cues rather than intrinsic cues drive consumer perceptions of product quality.

Major underlying issues relating to cue utilization theory include (1) the relationships among consumers' use of cues in evaluating perceived versus objective quality, (2) the comparison of consumer perceptions of overall quality versus objective measures of overall quality, and (3) the efficacy of training to improve the correspondence (accuracy) of consumer perceptions of overall quality with objective quality if many consumers are unable to accurately judge quality when brands vary substantially on overall objective quality. This article focuses on theory and empirical research relating to the first two issues.

The empirical study here includes a between-subjects experiment demonstrating that few intrinsic cues relate to both consumer quality perceptions and objective quality; consumer judgments about extrinsic cues relate to their perceptions of overall quality but not objective quality; while positive, the relationship between consumer overall perception of quality and objective quality is not substantial. Thus, training may be useful to aid consumers in achieving

higher correspondence in their perceptions of overall and actual quality in contexts where overall quality differs substantially among competing brands.

Though receiving little attention in the literature since its publication, the theoretical contributions by Cox (1973) are highly relevant for advancing cue utilization theory. Cox (1973) identifies two major characteristics of information used by consumers for evaluating products, which he labeled “predictive value” and “confidence value.” Information has **predictive value** to the degree the consumer believes that the information provides valid indicators or cues of relevant characteristics concerning a product or other object’s quality. Cox (1973) provides the example that if you knew for certain that a stereo amplifier contained high-quality internal components, you would say that there was a high probability that the amplifier was of good quality. Internal components, then, would be a high predictive value cue. (But note that high predictive value does not guarantee high performance outcomes.) On the other hand, the knobs on the front of the amplifier would be a low predictive value cue for most consumers; if asked, they would likely admit that the appearance of the knobs does not necessarily relate to the stereo amplifier’s performance quality.

Cox (1973) raises the question of why consumers do not always rely on information of high predictive value. He proposes a confidence value of information dimension to explain this behavior. **Confidence value** is a measure of how certain the consumer is that the cue is what the consumer thinks it is. A consumer may be unable to discriminate with confidence between good and bad internal components of a stereo amplifier. For her, this would be a low confidence (LC) value cue, even though it is high in predictive value (HP). The reciprocal of stimulus ambiguity of information is another name for confidence value. However, the same consumer is likely to be quite confident in judging whether the price of each brand of stereo amplifier is low, average,

or high—her confidence value is high in discriminating brands by price even though she may recognize that price level is not highly predictive of objective quality—price is viewable as a HC-LP cue.

Using a sample of 414 housewives to evaluate brands of nylon stockings, Cox (1973) reports that a low predictive value – high confidence value cue was more likely to be utilized for estimating quality than a high predictive value – low confidence value cue. Thus, such findings indicate that the confidence value of a cue may have veto power over predictive value, that is, while consumers may prefer to use a cue high in predictive value to judge a brand's quality, they only do so when they have high-confidence value in evaluating the meaning of the cue. If consumers are unable to identify a cue possessing both high confidence and high predictive value, they will use a cue with high confidence and low predictive value in judging the brand's overall quality rather than the reverse.

Recent evidence suggests that cue utilization processes by consumers mostly occur unconsciously with consumers' use of low-predictive-high-confidence-value extrinsic cues (e.g., price and advertising claims) has been found to increase their mental and physical performances following brand consumption; participants in such experiments do not subsequently report cue-performance relationships on such extrinsic cues with their subsequent performances (Shiv, et al., 2005).

However, examining the impact on consumer mental and physical performances for two or more levels of a criterion that objectively relates to performance capability and two or more levels of a predictive value at two or more levels of a confidence value of a cue remains for future research. (This issue is beyond the objectives of the present study). Shiv et al. (2005) do not test the impact of two or more levels of a cue objectively known to influence performance



as well as two or more levels of an extrinsic cue – they examine the impact of varying price paid by consumers for a physically identical brand using between-subjects experiments. Thus, their findings show that (1) physical and mental performances by consumers receiving the high level of a LP-HC cue is higher than consumers receiving the low level of the LP-HC cue and (2) consumers in both the high and low value LP-HC cue conditions are nonconscious of the impact of such external cues on actual performance.

Using a two-by-two experimental design, comparing objective performance following consumption of a product (brand) high in intrinsic quality coupled with a low value of a LP-HC cue (e.g., price) likely will swamp the placebo effect of product low in intrinsic quality coupled with a high value of LP-HC cue (i.e., no ingredients that would sustain high performance coupled with a high price). This view is counter to relativistic philosophy. “An extreme form of relativistic philosophy (occasionally termed nihilistic by its detractors) holds that reality does not exist independent of human perception (e.g., Lincoln & Cuba 1985). For example, Collins (1981, p. 54) suggests that ‘the natural world in no way constrains what is believed to be’” (Rao, 2005, p. 401).

Raising the questions, “If perceptions can influence the performance of objectively identical products, is there such a thing as objective quality? Even if objective quality exists, does it matter?” (Rao, 2005, p. 403), is to propose an absurd primrose path. However, testing the hypothesis is necessary that applying a wide-range of objective quality levels influences performance outcomes independently from the influence of nonconscious perceptions of subjective quality. The following discussion of a thought experiment illustrates this perspective.

Formal experiments that include testing the effects on performance outcomes of two or more levels of a key ingredient that relates to objective performance along with testing high

versus low predictive and confidence value cues (e.g., a 2x2x2 experimental design) would provide useful knowledge of the limits of placebo effects and relativistic versus objective perspectives. Table 1 presents the design of a thought experiment (“gedanken” in German, see Cohen, 2005) with hypothetical (expected) findings. A thought experiment includes a “property space analysis” (Lazarsfeld, 1937) of possible influences in a given context and predicts likely outcomes of specific configurations (i.e., causal recipes) of antecedent conditions. A property space analysis includes considering the impact of an outcome condition (i.e., “dependent variable” using an empirical positivistic term) for each of all theoretically possible configurations of antecedent conditions (“independent variables”).

Table 1 here.

The hypothetical findings in Table 1 illustrate substantial main and interaction effects for predictive and confidence value dimensions in a cue as well as objective quality on performance with using a product or service. To increase understanding of these proposed findings, consider the findings to be human trials in using an erectile dysfunction medication. The row in Table 1 represent the objective quality levels including (row 1) a placebo condition of zero-active ingredients and a (row 2) full-dosage level of the active ingredient in the medication. Price level is representative of a LP-HC cue. A product label describing the chemical composition of the medication represents a HP-LC cue.

Cues that are HP-HC and LP-LC are default configurations. Many consumers lack the training and knowledge necessary for using HP-HC. Most consumers are able to find a cue that they are confident in judging at a high versus low level and thus avoid relying on an HP-LC cue.

However, the property space analysis in Table 1 includes both HP-LC and LP-LC configurations for completeness and to illustrate theoretical findings that would be expected for such extreme conditions.

Consumers frequently find themselves in evaluation-dilemma contexts that Cox (1973) describes—using either HP-LC or LP-HC cues for making product quality judgments. Cox (1973) suggests that consumers will rely on LP-HC cues rather than HP-LC cues and Shiv et al. (2005) show that increasing the level of an LP-HC cue does increase objective performance outcomes (cell 5 vs. cell 6 in Table 1). However, Shiv et al. (2005) do not test different levels of objective quality in their studies.

The thought-experiment findings in Table 1 include increases in performance outcomes for both high versus low levels of LP-HC conditions for high versus low objective quality conditions (cells 13 versus 5 and cells 14 versus 6). Note the hypothetical interaction finding among these four cells: the impact on objective performance for the high versus low LP-HC configuration doubles when objective quality is high versus low.

Note also in Table 1 that the hypothetical findings express the view that performance outcomes levels are the same for high levels of LP-HC and HP-HC both in low and high objective quality contexts (cells 5 and 1 and cells 13 and 9, respectively). A high level of a LP-HC cue represents a talisman enabler for achieving high objective performance—within a range of outcome values associating with objective quality.

## **BRUNSWIK LEN'S MODEL**

Unfortunately, consumers' use of the predictive value of information has not been investigated thoroughly (Uekermann, Herrmann, Wentzel, & Landwehr, 2010). The present study focuses on consumers' use of product cues having high and low predictive values. The

analysis is based on a modification of Brunswik's (1955, 1956) lens model and examines consumer evaluations of the quality of three brands of peanut butter. Figure 1 illustrates the Brunswik's lens model as Hammond and Summers (1972) conceptualize and Tapp (1984) applies theoretically to consumer research. Both theoretical and empirical applications of Brunswik's lens model in psychology and marketing include the studies by Prabhaker and Sauer, (1994) and Bélisle and Bodur (2010). Prabhaker and Sauer (1994) emphasize the theoretical value of Brunswik's lens model in theory development to explain how consumer's evaluate competing brands; they show consumers' use of hierarchical heuristics in judging competing brands on one-to-three attributes is an effective strategy for identifying the highest performing brand.

Brunswik's lens model requires that some "objective" criterion or "distal variable," such as some measure of a product's actual quality, be available. The correlation between a given cue dimension and this objective criterion ( $Y_e$ ) serves as an index of the cue's relevance with respect to the criterion; this correlation has been called the cue's ecological validity ( $r_{e,i}$ ). In addition, computing the correlation between the individual's prediction and the actual criterion is possible. This correlation, called the achievement index ( $r_a$ ), reflects the accuracy of the "individual's" judgment. The correlations of the informant's beliefs concerning cues and the informant's estimate of the criterion are the cue utilizations ( $r_{s,i}$ ). The consumer's perception of product quality would be a measure of the "informant's estimate" ( $Y_s$ ).

Figure 1 here.

Early studies employing Brunswik's lens model examine the degree to which informants can learn to from more accurate inferential beliefs toward the distal variable (Fishbein & Ajzen 1975). Several studies show that accuracy increases as the informant's weights (i.e., her own cue utilizations) come to approximate the ecological validity of cues ( $r_{w,i} = r_{e,i}$ ). When informants are given feedback as to the accuracy of their judgments, they progressively learn to place more appropriate weights on the various cues (Azuma & Cronbach, 1966; Summers, 1962). With respect to the type of feedback given, Hammond and Summers (1972) find that telling informants whether their inferences were correct or incorrect is not as effective as giving them information about the degree to which they placed appropriate weights on the various cues.

The validity of consumer predictive values of cue dimensions ( $r_{p,i}$ ) is defined in the present study as the correlation of consumer beliefs that the product possesses specified attributes with the objective criterion ( $Y_e$ ), for example, the correlation of consumers' perceptions of fresh aroma of a brand of peanut butter with an objective measure of overall quality of the brand of peanut butter. The measure of  $r_{p,i}$  was used as a surrogate for  $r_{e,i}$  in the empirical study. That is, the cue's actual relevance to an objective criterion was not measured. No objective measure of fresh aroma for the product evaluated (peanut butter) was used and  $r_{e,i}$  was not computed. The correlations of consumer perceived fresh aroma with an objective criterion (an independent measure of quality) are examined as measures of  $r_{p,i}$ .

The present study measures cue utilizations ( $r_{s,i}$ ). Cue utilization likely relates to a consumer's confidence value of an attribute. Consumers are likely to be confident in using cues (attributes) with significantly positive cue utilization correlations for forming their beliefs toward the objective criterion. This study reports the cue utilization ( $r_{s,i}$ ) predictive validity ( $r_{p,i}$ ) and achievement ( $r_a$ ) of consumers' perceived quality and actual quality for brands of peanut butter

varying in actual quality. This type of analysis may be a useful research step for developing programs to improve consumer judgments or product quality.

## **METHOD**

### **Informants**

The informants were 98 female graduate students from the College of Education of a large university located in the eastern region of the United States. Three informants were eliminated from the analysis because of missing data, thus a total of 95 informants were actually used in the study.

### **Product**

Three different brands of peanut butter commonly found in local supermarkets were utilized. Consumers Union (2008) tested the three brands prior to the study and rated them substantially different in quality. All three brands were judged as being acceptable by Consumers Union; however, one was rated “excellent,” another “good” and the third only “fair.” Actual quality was operationally defined for the purpose of this study in terms of these *Consumer Reports* ratings. No information concerning brand names or comparative qualities was given to the informants.

Similar operational definitions of actual quality ratings have been used to compare advertising (Rotfield & Rotzoll, 1976) and price (Sproles, 1977) with product quality. However, *Consumer Reports* ratings are but one method to measure actual qualities. The validity of this method has not been established and this limitation is relevant to the present study.

### **Attributes**

Nine product attributes or cue dimensions were included in the analysis of actual quality and perceived quality of the brands. Five cues used by Consumers Union's food experts in rating the peanut butters were utilized. Price and national advertising cues were added since many market researchers postulate a positive relationship between these two dimensions and either actual or perceived quality (Gardner, 1971; Jacoby, Olson, & Haddock, 1971; Natarajan, & Goff, 1992; Peterson, 1970; Stafford & Enis, 1969; Woodside, 1974). Prior informal conversation with ten known consumers of peanut butter suggested that two additional cues – recent experience in eating peanut butter (within seven days) and the perceived probability that one's family would like a particular brand – might affect the customer's perception of the brands' qualities.

### **Procedure and Data Collection Instrument**

The three different brands of peanut butter were displayed in identical and unmarked containers on a table located in the canteen section at the university dining facility. A sign over the table announced "Peanut Butter Quality Test." Graduate, female, education majors were selected as informants on the basis of convenience and individually escorted to the table.

Using a post-test only with random-assignment-to-groups design (Campbell & Stanley, 1966; Cook & Campbell, 1979), each informant was asked to taste and rate one of the peanut butter brands. The specific brand to be tested in each case was randomly chosen prior to the informant's arrival at the table.

A questionnaire was administered to each informant immediately after she had sampled the assigned brand of peanut butter. Seven-point semantic differentials with bipolar adjectives of very unlikely to very likely were used to measure perceptions of product quality and the extent to which the brand possessed eight attributes: (1) an aroma of freshly roasted peanuts, (2) a smooth

texture, (3) a distinct peanut flavor, (4) tasted creamy, not gritty, (5) stuck to the roof of one's mouth, (6) was a nationally advertised brand, (7) would be liked by one's family and (8) was a high-priced brand. A dichotomous response (yes or no) was used for a final question concerning whether the informant has eaten peanut butter within the last seven days.

Available research (Alvarado & Linnemann, 2010) on the predictive value of consumer tastings of a product related to consumer food consumption (23 brands of coffee) applies a non-scientific comparison of "12 non-expert consumers to determine if their discriminations matched the [one] expert's judgment. The results of the consumer panel demonstrated that discrimination between coffees by consumers was predicted by acidity differences assessed by the cupper. The same held for body but not necessarily for fragrance and aroma... The paper revealed that discrimination between the coffees by the consumer panel matched the coffee cupper's [expert's] evaluation differences. The high consistency of the results obtained from the consumer panel underpins that the respondents did not have much difficulty in rating the coffees with the same scores as the professional coffee judge" (Alvarado and Linnemann, 2010, p. 1023).

The purposes of the present study include applying a formal behavioral science design with Brunswick's lens model to test the efficacy of consumer judgments in food tastings. The findings from the rigorous design of the present study serve to deepen and extend the research that Alvarado and Linnemann (2010) report.

## **FINDINGS**

As Hammond (1955) and Hirsch, Hammond, and Hirsch (1964) suggest, multiple regression and correlation analyses were used to analyze the data. Actual quality ratings, consistent with the evaluations of Consumer's Union, were assigned to the three brands. Coding



of actual quality for the purpose of analysis was as follows: (a) very good quality = 3, (b) good quality = 2 and (c) fair quality = 1.

Figure 2 reports cue utilizations, predictive validities, and the achievement index. Tables 2 and 3 provide the findings of the regression analyses. Respondents' reports on eating or not eating peanut butter during the past seven days had no influence on the findings and consequently, this independent variable is not included in the discussion of the findings.

Figure 2 here.

Two findings emerge from the analyses. One, the achievement index ( $r_a = .18$ ) reflects the low accuracy of the informants' judgments of quality. That is, little correlation exists between actual quality of the peanut butters and quality as perceived by the informants. Additionally, the major cues used by informants in making their qualitative judgments (cue utilizations) differ from the significant dimensions associated with actual quality (predictive validities). Actual quality, for example, correlates highly with perceived texture and creaminess whereas perceived quality correlates highly with perceived family-liking, national advertising, aroma, and flavor.

The specific purpose of the regression analyses was to better identify and compare the important determinants of perceived and actual quality. The stepwise procedure was used in order to account for the correlations among the independent variables.

Two variables – texture and creamy taste – were the major determinants of actual quality (Table 2) in the study. These two factors accounted for 44 percent of the explained variance in the dependent variable. The third variable entered into the stepwise regression model –

perception of the brand as being nationally advertised – added little to explained variance. No other independent variable was found to be a statistically significant determinant of actual quality.

Table 2 here.

Perceived quality was influenced largely by (1) the extent to which the informant believed her family would like the brand and (2) the brand's aroma (see Table 3). These two variables accounted for 72 percent of the variance in judgments of quality. Two other variables – perceptions of the brand as being high-priced and nationally advertised – accounted for an additional 2 percent in explained variance of perceived quality.

Table 3 here.

## **DISCUSSION**

Cox (1973) argues that predictive value is a basic force in determining information value (and hence cue utilization) but that confidence value acts as a qualifying variable and carries a strong veto. That is, unless the consumer feels sufficiently confident about evaluating a cue she will be less likely to use it – no matter how high its predictive value. Cox (1973) concludes that a consequence of this phenomenon is that a great amount of high predictive value information is never used or is, at best, underutilized. Furthermore, Cox argues that consumers often over use much low predictive value information because its confidence value is high. The results of this study provide support for Cox's thesis.

Informants in the experiment used low predictive value cues, such as subjective perceptions of price, national advertisement or family-liking, in judging the peanut butters rather than utilizing the more relevant and predictive cues of texture, peanut butter flavor and creamy vs. gritty taste. Aroma was the only high predictive value cue given significant weight in making quality judgments. These cues may or may not have been utilized because of their greater confidence value (i.e., because informants felt better able to make judgments along these lines).

These results may follow from informants using a simplifying or satisficing choice strategy rather than an optimizing strategy. Wright (1975) differentiates between optimizers, who try to maximize the quality of their choice (select the “best” alternative) and satisficers, who seek merely a “satisfactory” alternative. With peanut butter, satisficers might be content to have their families finish the whole jar (hence the emphasis on family liking it), while optimizing consumers might be more inclined to apply Consumers Union standards to their purchases or evaluations. Whatever the rationale, however, informants did focus on cues that differed from the significant perceived determinants of actual quality as operationally defined.

A need for consumer education in the process of making quality evaluations is implied by the findings. This may be true not only for peanut butter but for other products as well. Consumers may compulsively use price and national advertising as indicators of product quality when such cues may have little bearing on the actual quality (cf. Nataraajan and Goff 1992). Woodside (1974), for example, examines the effects of six levels of actual prices, including no price, on perceived quality ratings of an electric lunch box and found a positive linear relationship between the level of price cue and quality evaluations.

Rotfeld and Rotzoll (1976) examine the relationship between advertising expenditures and actual product quality and find inconclusive results. They conclude that, among nationally

advertised brands, product quality is not well correlated with the amount of national advertising. The chances of selecting a higher quality brand, however, did tend to be higher when the customer chose from a group of nationally advertised brands.

Fishbein and Ajzen (1975) hypothesize that if consumers only knew how inaccurate their judgments of perceived quality were, they would place more weight on cues with higher ecological validity. A consumer who is familiar with attributes relevant to product quality should be less likely to judge quality on the basis of such cues as perceived family-liking, price, or national advertising.

This study contains several limitations which may affect the results. First, the sample was both small in size and homogeneous in composition. The data presented here represent perceptions of a small group of female graduate students and, consequently, may not be accurate with respect to peanut butter purchasers in general. A second limitation involves the use of only three brands of the product. In a typical purchase decision, consumers usually confront a much larger set of alternatives from which to choose. This feature should be incorporated in future attempts to investigate perceived quality and actual quality relationships through use of modified Brunswik's lens model. Third, only one method was used to establish the actual quality ratings of the three brands of peanut butter. Additional research should be performed using other measures of actual quality.

This article shows how thought experiments are helpful in clarifying and deepening theoretical propositions and, via some thought experiments, such mental exercises suggest one or more methods for testing hypotheses. The thought experiment in the present study describes how objective quality levels have influences that interact but are likely distinct from placebo effects (i.e., varying external cue levels such as low versus high price) in influencing

performance outcomes. Such thought experiments often provide useful and very specific implications for future research.

Further research would be useful to learn the nature of the relationships between predictive and ecological validities. Do correlations of consumers' cue perceptions with an objective criterion correspond closely with correlations of objective measures of cues and the same objective criterion? Finally, training programs to improve consumers' use of cues with high ecological validities needs to be developed and tested. Studying consumer predictive and confidence values of information may be useful particularly for consumer educational programs. Such studies should provide guidance for identifying the relevant content and evaluating the success of such programs.

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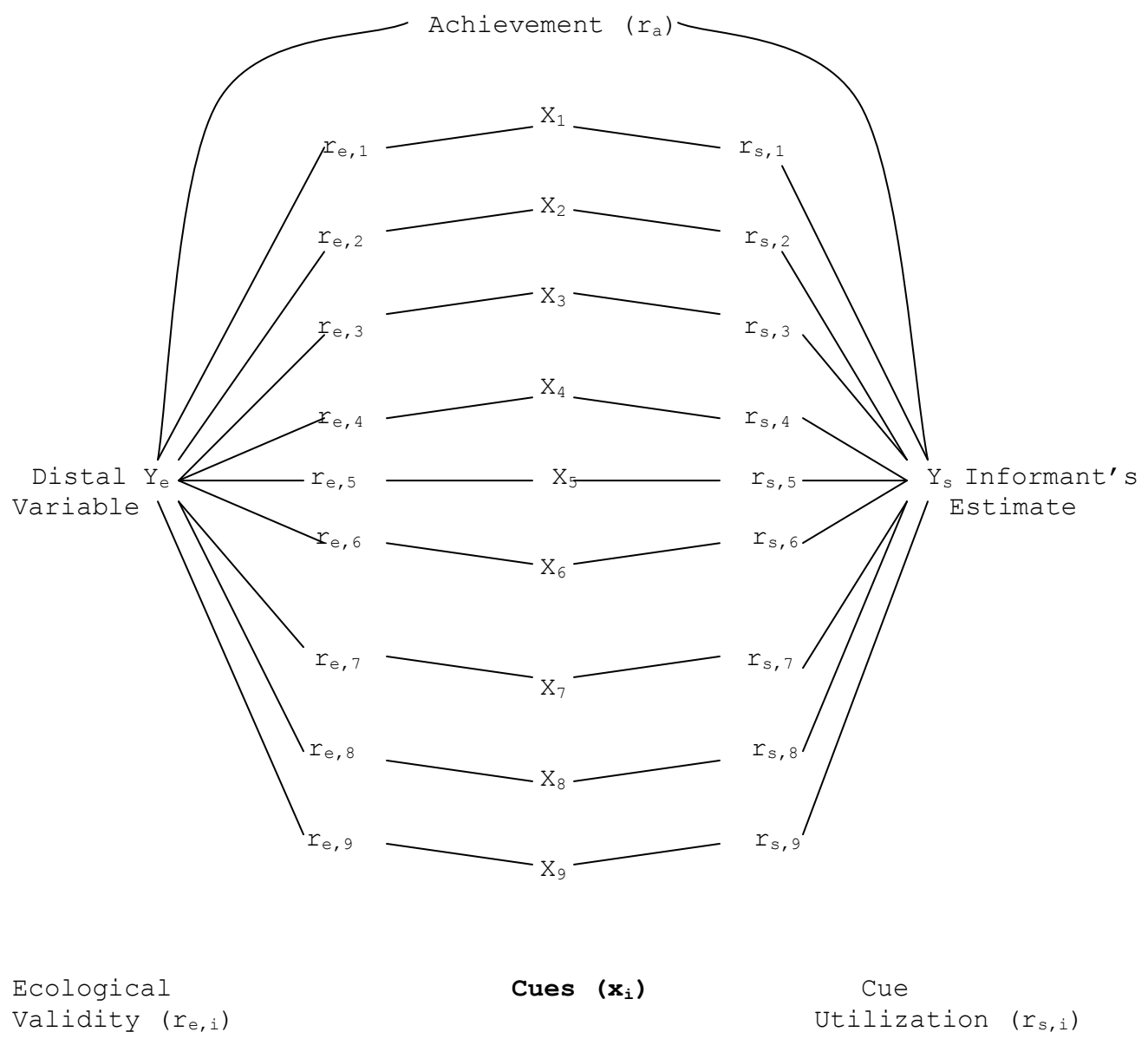
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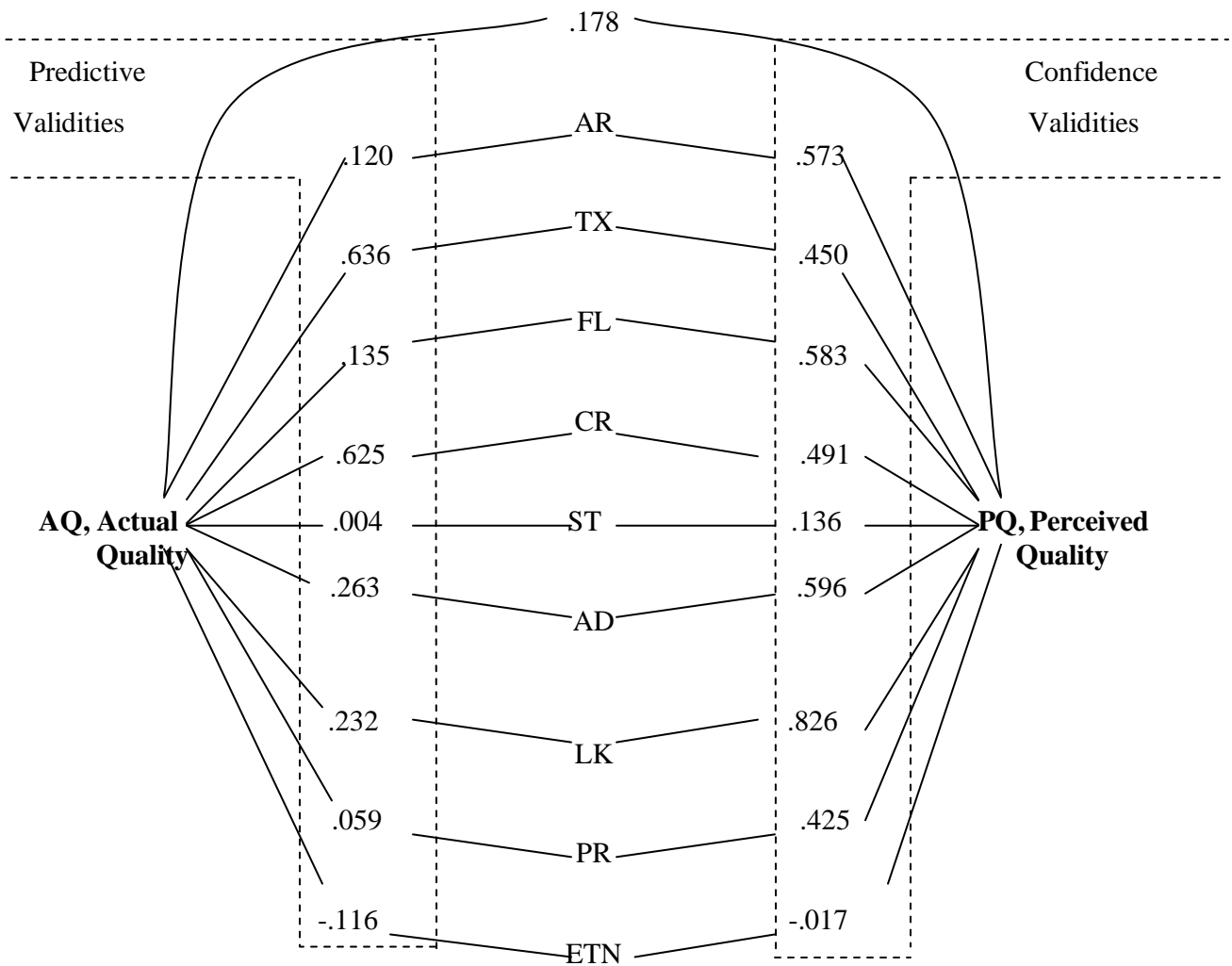
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**Figure 1**  
**Brunswik's Lens Model**



**Figure 2**  
**Brunswik's Lens Model as Applied to Perceptions of Peanut Butter Quality**

Note: Numbers are Pearson product-moment correlations

Dictionary: AR = Aroma, AD = Nationally Advertised, TX = Texture  
LK = Family-liking, FL = Flavor, PR = Price, CR = Creaminess  
ETN = Eaten recently, ST = Stickiness.

**Table 1**  
**Thought Experiment Design and Hypothetical Performance Findings**  
(z transformations of raw scores)

Level of an intrinsic cue objectively confirmed to impact performance	High predictive and high confidence value cue condition		High predictive and low confidence value cue condition		Low predictive and high confidence value cue condition		Low predictive and low confidence value cue condition		Average of Total
	High	Low	High	Low	High	Low	High	Low	
<b>Low (0.00)</b>	(1) +0.50	(2) 0.00	(3) - 0.50	(4) -1.00	(5) <b>+ 0.50<sup>a</sup></b>	(6) <b>-0.50<sup>a</sup></b>	(7) -1.50	(8) -2.00	-0.5625
<b>High (+ 1.5)</b>	(9) +2.00	(10) +1.00	(11) +0.75	(12) +0.50	(13) <i>+2.00<sup>b</sup></i>	(14) <i>+0.50<sup>b</sup></i>	(15) +0.75	(16) +0.50	+1.00
<b>Average of Total</b>	+1.25	+0.50	+0.125	-0.25	+1.25	0.00	-0.375	-0.75	.2187

Notes: <sup>a</sup> Values in **bold** reflect the two treatment conditions and representative of objective performance outcomes that Shiv et al. (2005) report; <sup>b</sup> values in *italics* versus **bold** reflect the prediction of an interaction effect of varying high and low levels of both a LP-HC cue and an intrinsic cue confirmed to influence performance.

**Table 2**  
**Predictive Values of Actual Quality**

<u>Regression Analysis</u>					
Variables	b	beta	F	p	R <sup>2</sup> / (F) <sup>a</sup>
Texture	.128	.379	8.14	<.001	.44
Creaminess	.102	.318	5.71	<.005	(36.1)
(Constant)	.865				

<sup>a</sup> d.f. = 2, 92

Note: The “best” regression model is reported – “best” in that the partial coefficients were each statistically significant and the independent variables each substantially contributed to explained variance in the dependent variable.

**Table 3**  
**Predictive Values of Perceived Quality**

Variables	b	Regression Analysis			R <sup>2</sup> /(F) <sup>a</sup>
		beta	F	p	
Family-Liking	.588	.599	62.01	<.001	.74
Aroma	.102	.318	5.71	<.001	(64.64)
Price	.129	.113	3.77	<.01	
Nationally Advertised	.126	.127	3.48	<.05	
(Constant)	-.281				

<sup>a</sup> d.f. = 4, 90

Note: See footnote to Table 1.