How to grow a strawberry

Prof. dr. Bart De Langhe
KU Leuven & Vlerick Business School


Chiquita
Ecuador
tropical soul
Chiquita
Ecuador
grows on plants
Chiquita
Ecuador
100% natural energy

Evaluate each brand on each attribute.
Rate importance of each attribute.

- Taste
- Color
- Size
- Recognizability
- Sustainability
- Price

Taste

Price

Size

Color

Sustainability

Recognizability

Importance

Evaluation

Importance

Taste

Price

Size

Color

Sustainability

Recognizability

Evaluation

Importance

Taste

Size

Price

Color

Sustainability

Recognizability

Evaluation


Driscoll's
Only the Finest Berries™


Zespri™
KIWIFRUIT


Chiquita®


HOOGSTRATEN
STRAWBERRIES


Pink Lady®

Navigating by the Stars: Investigating the Actual and Perceived Validity of Online User Ratings

BART DE LANGHE
PHILIP M. FERNBACH
DONALD R. LICHTENSTEIN

This research documents a substantial disconnect between the objective quality information that online user ratings actually convey and the extent to which consumers trust them as indicators of objective quality. Analyses of a data set covering 1272 products across 120 vertically differentiated product categories reveal that average user ratings (1) lack convergence with *Consumer Reports* scores, the most commonly used measure of objective quality in the consumer behavior literature, (2) are often based on insufficient sample sizes which limits their informativeness, (3) do not predict resale prices in the used-product marketplace, and (4) are higher for more expensive products and premium brands, controlling for *Consumer Reports* scores. However, when forming quality inferences and purchase intentions, consumers heavily weight the average rating compared to other cues for quality like price and the number of ratings. They also fail to moderate their reliance on the average user rating as a function of sample size sufficiency. Consumers' trust in the average user rating as a cue for objective quality appears to be based on an "illusion of validity."

Keywords: online user ratings, quality inferences, consumer learning, brand image, price-quality heuristic

Consumers frequently need to make a prediction about a product's quality before buying. These predictions are central to marketing because they drive initial sales, customer satisfaction, repeat sales, and ultimately profit, as well as shareholder value (Aaker and Jacobson 1994; Bolton and Drew 1991; Rust, Zahorik, and Keiningham 1995). Before the rise of the Internet, consumers' quality predictions were heavily influenced by marketer-controlled variables such as price, advertising messages, and brand name (Erdem, Keane, and Sun 2008; Rao and Monroe 1989). But the consumer information environment has changed radically over the last several years. Almost all retailers now provide user-generated ratings and narrative reviews on their websites, and the average user rating has become a highly significant driver of sales across many product categories and industries (Chevalier and Mayzlin 2006; Chintagunta, Gopinath, and Venkataraman 2010; Loechner 2013; Luca 2011; Moe and Trusov 2011; for a recent meta-analysis, see Floyd et al. 2014).

Most people consider the proliferation of user ratings to be a positive development for consumer welfare. User

All authors contributed equally and are listed in alphabetical order. Bart de Langhe (bart.delanghe@colorado.edu) and Philip M. Fernbach (philip.fernbach@colorado.edu) are assistant professors of marketing, and Donald R. Lichtenstein (donald.lichtenstein@colorado.edu) is professor of marketing at the Leeds School of Business, University of Colorado, 419 UCB, Boulder, CO 80309. The authors acknowledge the helpful input of the editor, associate editor, and reviewers. The authors owe special thanks to Dee Warmath and also thank Andrew Long, Christina Kan, Erin Percival, Griffin Bohm, Brittany Hallett, and Bridget Leonard for research assistance, and John Lynch for comments on an earlier draft. In addition, the authors thank participants in seminars and lab groups at the University of Colorado at Boulder, Erasmus University, Ghent University, Stanford University, University of Southern California, Catholic University of Louvain, University of Michigan, and Yale University.

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★★★★½ **4.6 out of 5**

16 global ratings

★★★★☆ **4.1 out of 5**

20 global ratings

Marketing actions can modulate neural representations of experienced pleasantness

Hilke Plassmann*, John O'Doherty*, Baba Shiv†, and Antonio Rangel*‡

*Division of the Humanities and Social Sciences, California Institute of Technology, MC 228-77, Pasadena, CA 91125; and †Stanford Graduate School of Business, Stanford University, 518 Memorial Way, Littlefield L383, Stanford, CA94305

Edited by Leslie G. Ungerleider, National Institutes of Health, Bethesda, MD, and approved December 3, 2007 (received for review July 24, 2007)

Despite the importance and pervasiveness of marketing, almost nothing is known about the neural mechanisms through which it affects decisions made by individuals. We propose that marketing actions, such as changes in the price of a product, can affect neural representations of experienced pleasantness. We tested this hypothesis by scanning human subjects using functional MRI while they tasted wines that, contrary to reality, they believed to be different and sold at different prices. Our results show that increasing the price of a wine increases subjective reports of flavor pleasantness as well as blood-oxygen-level-dependent activity in medial orbitofrontal cortex, an area that is widely thought to encode for experienced pleasantness during experiential tasks. The paper provides evidence for the ability of marketing actions to modulate neural correlates of experienced pleasantness and for the mechanisms through which the effect operates.

orbitofrontal cortex | modulation by marketing actions | neuroeconomics | taste

A basic assumption in economics is that the experienced pleasantness (EP) from consuming a good depends only on its intrinsic properties and on the state of the individual (1). Thus, the pleasure derived from consuming a soda should depend only on the molecular composition of the drink and the level of thirst of the individual. In opposition to this view, a sizable number of marketing actions attempt to influence EP by changing properties of commodities, such as prices, that are unrelated to their intrinsic qualities or to the consumer's state. This type of influence is valuable for companies, because EP serves as a learning signal that is used by the brain to guide future choices. For example, when facing the choice between previously experienced restaurants, one would tend to avoid locales where previously meals were unsavory. Contrary to the basic assumptions of economics, several studies have provided behavioral evidence that marketing actions can successfully affect EP by manipulating nonintrinsic attributes of goods. For example, knowledge of a beer's ingredients and brand can affect reported taste quality (2, 3), and the reported enjoyment of a film is influenced by expectations about its quality (4). Even more intriguingly, changing the price at which an energy drink is purchased can influence the ability to solve puzzles (5).

Despite the importance and pervasiveness of various marketing actions, very little is known about the neural mechanisms through which they affect decisions made by individuals. An exception is a previous study demonstrating that knowledge of the brand of a culturally familiar drink, such as Coke, increases activation in the hippocampus, parahipoccampus, midbrain, dorsolateral prefrontral cortex, and thalamus (6). The authors of the previous study interpreted such activity as evidence for retrieval of brand information during the consumption experience.

Here, we propose a mechanism through which marketing actions can affect decision making. We hypothesized that changes in the price of a product can influence neural computations associated with EP. This hypothesis is based on previous findings showing that affective expectations influence appraisals made about hedonic experiences and, through this, the actual quality of experiences (2, 7, 8). Consider, for example, the experience of an individual sampling a wine for which he or she has information about its retail price. Because perceptions of quality are known to be positively correlated with price (9), the individual is likely to believe that a more expensive wine will probably taste better. Our hypothesis goes beyond this by stipulating that higher taste expectations would lead to higher activity in the medial orbitofrontal cortex (mOFC), an area of the brain that is widely thought to encode for actual experienced pleasantness (6, 10–16). The results described below are consistent with this hypothesis. We found that the reported price of wines markedly affected reported EP and, more importantly, also modulated the blood-oxygen-level-dependent (BOLD) signal in mOFC.

To investigate the impact of price on the neural computations associated with EP, we scanned human subjects ($n = 20$) using fMRI while they sampled different wines and an affectively neutral control solution, which consisted of the main ionic components of human saliva (17). We chose wine as a stimulus, because it is relatively easy to administer inside the scanner using computerized pumps, it induces a pleasurable flavor sensation in most subjects, and it varies widely in quality and retail price. Subjects were told they were sampling five different Cabernet Sauvignons, that the purpose of the experiment was to study the effect of degustation time on perceived flavors, and that the different wines would be identified by their retail prices (see Fig. 1*A*). Unbeknown to the subjects, the critical manipulation was that there were only three different wines, and two of them (wines 1 and 2) were administered twice, one identified at a high price and one at a low price. For example, wine 2 was presented half of the time at $90, its retail price, and half of the time at $10. Thus, the task consisted of six trial types: $5 wine (wine 1), $10 wine (wine 2), $35 wine (wine 3), $45 wine (wine 1), $90 wine (wine 2), and neutral solution. The wines were administered in random order, simultaneously with the appearance of the price cue. Subjects were asked to focus on the flavor of the wine during the degustation period and entered taste pleasantness or taste intensity ratings in every other trial (Fig. 1*B*).

Results

Modulation of Reported Pleasantness and Taste Intensity by Price. We measured the impact of price information on EP by comparing the mean reported liking rating for wines 1 and 2 when administered at a high vs. a low price. We found significant differences for both wines ($P < 0.001$, Fig. 1*C*). In addition, reported pleasantness was correlated with wine prices ($r = 0.59$, $P < 0.000$). We could not find a similar behavioral effect for intensity ratings (Fig. 1*D*). To explore further the role of prices on

Author contributions: H.P., J.O., B.S., and A.R. designed research; H.P. performed research; H.P. analyzed data; and H.P., J.O., B.S., and A.R. wrote the paper.

The authors declare no conflict of interest.

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‡To whom correspondence should be addressed. E-mail: rangel@hss.caltech.edu.

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Influence of Beer Brand Identification on Taste Perception

RALPH I. ALLISON
and
KENNETH P. UHL*

➤ As a company tries to find the factors accounting for strong and weak markets, typical consumer explanations for both tend to be in terms of the physical attributes of the product. Carling Brewing Company used a relatively inexpensive experiment to help dichotomize contributing influences as being either product or marketing oriented and, also, to indicate the magnitude of the marketing influence for various brands. The experiment involved the use of groups of beer drinkers that tasted (drank) and rated beer from nude bottles and from labeled bottles.

As a company tries to find the factors accounting for strong and weak markets, typical consumer explanations for both tend to be about the physical attributes of the product. That is, the product quality often becomes both the hero and the culprit, like Dr. Jekyll and Mr. Hyde, but with the hideous reversal coming not by night but by market. The experiment presented in this paper was also designed to give rough measurements of the magnitude of the marketing influences. Unidentified and then labeled bottles of beer were delivered to homes of taste testing participants on successive weeks. The drinkers' taste test ratings provided the data for the study.

THE EXPERIMENTAL DESIGN[1]

The principal hypothesis subjected to testing through experimentation was this: "Beer drinkers cannot distinguish among major brands of unlabeled beer either on an overall basis or on selected characteristics." Beer drinkers were identified as males who drank beer at least three times a week.

The test group was composed of 326 drinkers who were randomly selected, agreed to participate in the study, and provided necessary classification data. Each participant in the experiment was given a six-pack of unlabeled beer, identified only by tags bearing the letters A, B, C, D, E, F, G, H, I, or J. The labels had been completely soaked off and the crowns had been wire brushed to remove all brand identification from the 12-ounce deposit brown bottles. Each six-pack contained three brands of beer with individual bottles randomly placed in the pack so no one lettered tag predominated in any one position.[2] There were six different pairs placed among the 326 participants. An effort was made to give each participant a six-pack that contained the brand of beer he said he most often drank. The groups and numbers were placed as follows:

	Placed
Group 1 (AB, CD, EF)	53
Group 2 (AB, CD, IJ)	55
Group 3 (AB, CD, GH)	55
Group 4 (AB, EF, IJ)	55
Group 5 (AB, GH, IJ)	54
Group 6 (AB, EF, GH)	54
	326

A and B represented one of the company's beer brands; C and D represented one major regional beer brand; and E and F were one other major brand of regional beer. G and H were one national brand; and I and J were the fifth well-known beer brand used in the experiment. Among these five brands there were some taste differences discernible to expert taste testers.

The lettered tags (one around the collar of each bottle in the six-pack) carried a general rating scale from "1" (poor) through "10" (excellent) on the one side and a list of nine specific characteristics on the reverse side (see Exhibit #1). The specific characteristics, which included after-taste, aroma, bitterness, body, carbonation, foam, lightness, strength, and sweetness,

* Ralph Allison is director of market research for National Distillers Products Company and was formerly director of planning and research for the Carling Brewing Company; Kenneth P. Uhl is associate professor of marketing and assistant dean of the College of Business Administration at the State University of Iowa.

[1] The experimental design and the findings outlined are from one market area. However, similar experiments were conducted and similar results were obtained in several other markets.

[2] Pretesting gave no evidence of a positional or letter bias; *i.e.*, for participants to drink or rate the beer in any particular alphabetical or spatial order.

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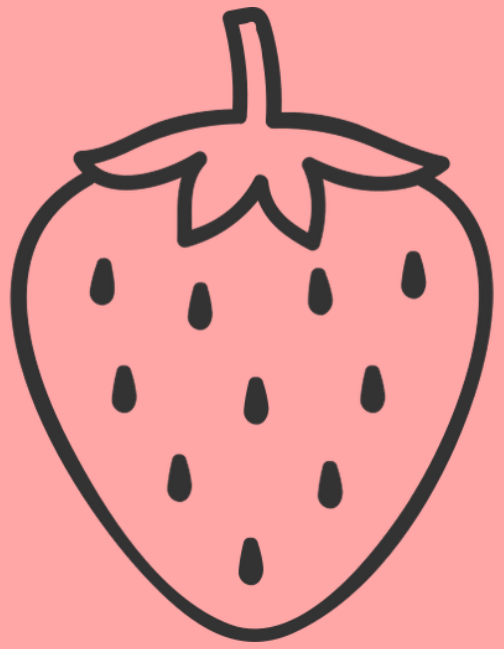
Myth

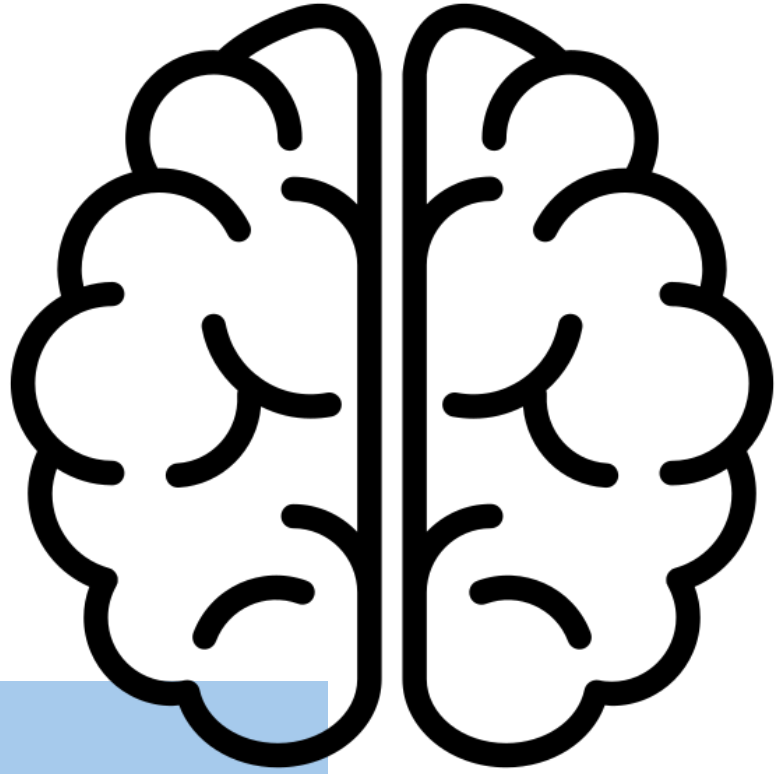
Product ingredients are the most important driver of quality perceptions.



Truth

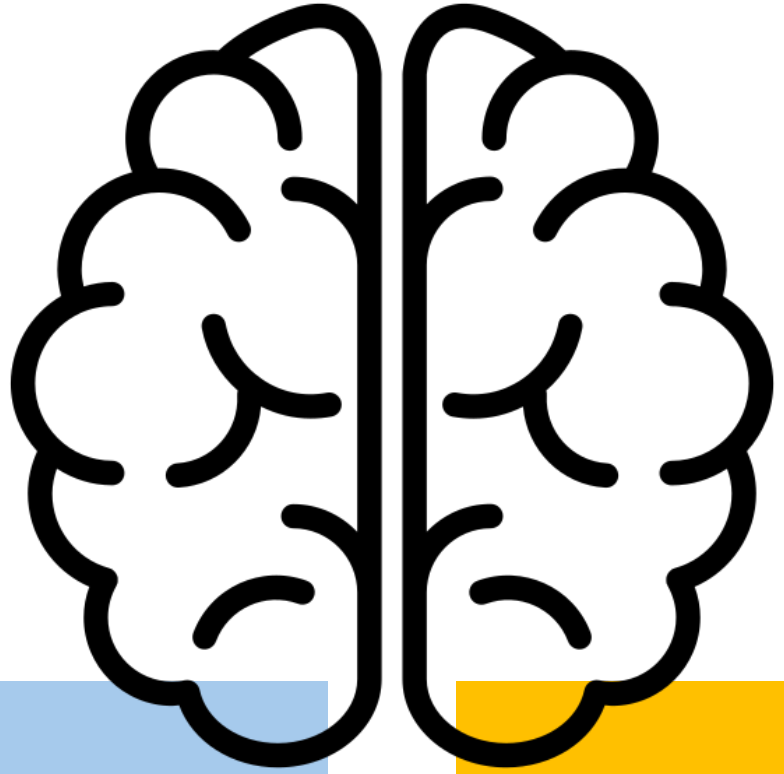
Brand knowledge is the most important driver of quality perceptions.

Brand Knowledge



Recognition:
Are we known?

Brand Knowledge



Recognition:
Are we known?

Image:
What are we known for?

Importance

Taste

Price

Size

Color

Sustainability

Recognizability

Evaluation

Importance

Taste

Size

Price

Color

Sustainability

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Evaluation


Driscoll's
Only the Finest Berries™


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2002, Vol. 109, No. 1, 75–90

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Models of Ecological Rationality: The Recognition Heuristic

Daniel G. Goldstein and Gerd Gigerenzer
Max Planck Institute for Human Development

One view of heuristics is that they are imperfect versions of optimal statistical procedures considered too complicated for ordinary minds to carry out. In contrast, the authors consider heuristics to be adaptive strategies that evolved in tandem with fundamental psychological mechanisms. The recognition heuristic, arguably the most frugal of all heuristics, makes inferences from patterns of missing knowledge. This heuristic exploits a fundamental adaptation of many organisms: the vast, sensitive, and reliable capacity for recognition. The authors specify the conditions under which the recognition heuristic is successful and when it leads to the counterintuitive less-is-more effect in which less knowledge is better than more for making accurate inferences.

What are heuristics? The Gestalt psychologists Karl Duncker and Wolfgang Koehler preserved the original Greek definition of "serving to find out or discover" when they used the term to describe strategies such as "looking around" and "inspecting the problem" (e.g., Duncker, 1935/1945). For Duncker, Koehler, and a handful of later thinkers, including Herbert Simon (e.g., 1955), heuristics are strategies that guide information search and modify problem representations to facilitate solutions. From its introduction into English in the early 1800s up until about 1970, the term *heuristics* has been used to refer to useful and indispensable cognitive processes for solving problems that cannot be handled by logic and probability theory (e.g., Polya, 1954; Groner, Groner, & Bischof, 1983).

In the past 30 years, however, the definition of heuristics has changed almost to the point of inversion. In research on reasoning, judgment, and decision making, heuristics have come to denote strategies that prevent one from finding out or discovering correct answers to problems that are assumed to be in the domain of probability theory. In this view, heuristics are poor substitutes for computations that are too demanding for ordinary minds to carry out. Heuristics have even become associated with inevitable cognitive illusions and irrationality (e.g., Piattelli-Palmerini, 1994).

The new meaning of heuristics—poor surrogates for optimal procedures rather than indispensable psychological tools—emerged in the 1960s when statistical procedures such as analysis of variance (ANOVA) and Bayesian methods became entrenched as the psychologist's tools. These and other statistical tools were transformed into models of cognition, and soon thereafter cognitive processes became viewed as mere approximations of statistical procedures (Gigerenzer, 1991, 2000). For instance, when Ward Edwards (1968) and his colleagues concluded that human reasoning did not accord with Bayes's rule (a normative standard for making probability judgments), they tentatively proposed that actual reasoning is like a defective Bayesian computer with wrongly combined values (misaggregation hypothesis) or misperceived probabilities (misperception hypothesis). The view of cognitive processes as defective versions of standard statistical tools was not limited to Edward's otherwise excellent research program. In the 1970s, the decade of the ANOVA model of causal attribution, Harold Kelley and his colleagues suggested that the mind attributes a cause to an effect in the same way that experimenters draw causal inferences, namely, by computing an ANOVA:

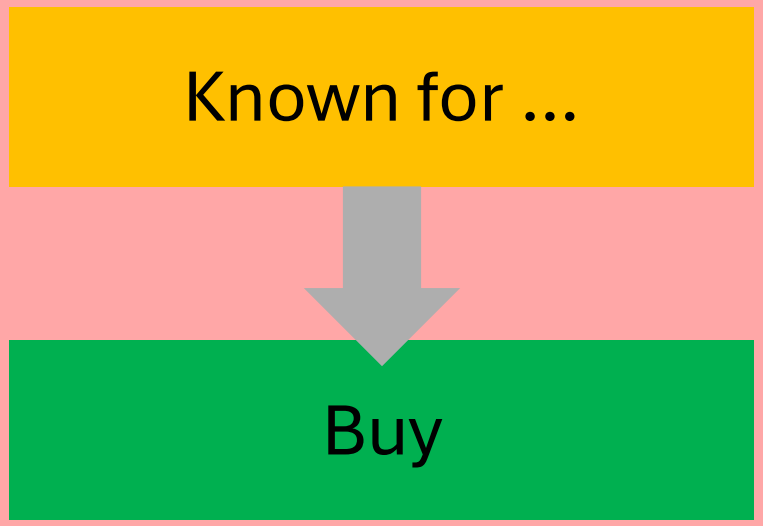
> The assumption is that the man in the street, the naive psychologist, uses a naive version of the method used in science. Undoubtedly, his naive version is a poor replica of the scientific one—incomplete, subject to bias, ready to proceed on incomplete evidence, and so on. (Kelley, 1973, p. 109)

The view that mental processes are "poor replicas" of scientific tools became widespread. ANOVA, multiple regression, first-order logic, and Bayes's rule, among others, have been proposed as optimal or rational strategies (see Birnbaum, 1983; Hammond, 1996; Mellers, Schwartz, & Cooke, 1998), and the term *heuristics* was adopted to account for discrepancies between these rational strategies and actual human thought processes. For instance, the representativeness heuristic (Kahneman & Tversky, 1996) was proposed to explain why human inference is like Bayes's rule with the base rates left out (see Gigerenzer & Murray, 1987). The common procedure underlying these attempts to model cognitive processes is to start with a method that is considered optimal, eliminate some aspects, steps, or calculations, and propose that the mind carries out this naive version.

We propose a different program of cognitive heuristics. Rather than starting with a normative process model, we start with fundamental psychological mechanisms. The program is to design and test computational models of heuristics that are (a) ecologically rational (i.e., they exploit structures of information in the environment), (b) founded in evolved psychological capacities such as memory and the perceptual system, (c) fast, frugal, and simple enough to operate effectively when time, knowledge, and computational might are limited, (d) precise enough to be modeled computationally, and (e) powerful enough to model both good and poor reasoning. We introduce this program of fast and frugal heuristics here with perhaps the simplest of all heuristics: the recognition heuristic.

Correspondence concerning this article should be addressed to Daniel G. Goldstein and Gerd Gigerenzer, Center for Adaptive Behavior and Cognition, Max Planck Institute for Human Development, Lentzeallee 94, 14195 Berlin, Germany. E-mail: goldstein@mpib-berlin.mpg.de and gigerenzer@mpib-berlin.mpg.de

Myth



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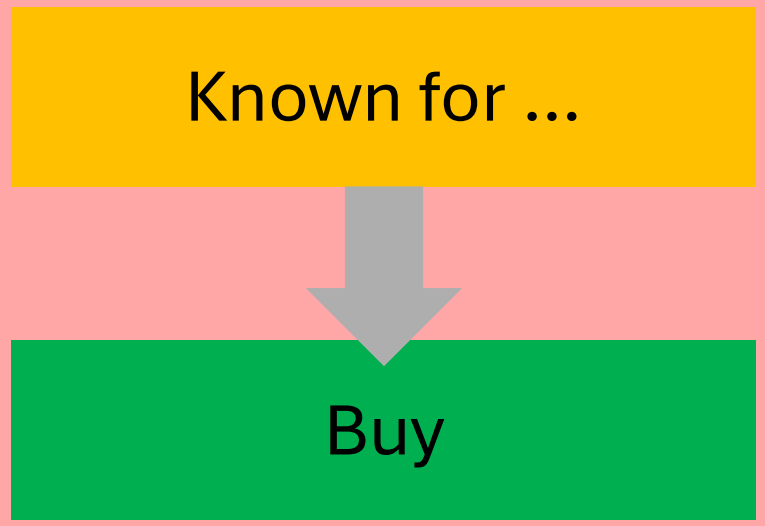
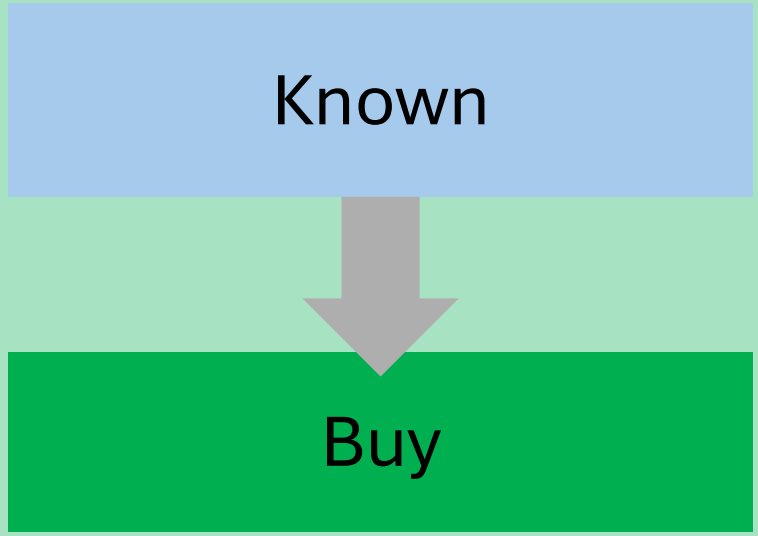


Truth



POSTDECISION CHANGES IN THE DESIRABILITY OF ALTERNATIVES[1]

JACK W. BREHM[2]
University of Minnesota

THE importance of the choice situation is reflected in the considerable amount of theory and research on conflict. Conflict theory has generally dealt, however, with the phenomena that lead up to the choice. What happens after the choice has received little attention. The present paper is concerned with some of the consequences of making a choice.

Previous consideration of the consequences of choice have been limited to relatively unspecified hypotheses (1, 3) or to qualitative analysis (4). However, a recent theory by Festinger (2) makes possible several explicit predictions. According to this analysis of the choice situation, all cognitive elements (items of information) that favor the chosen alternative are "consonant," and all cognitive elements that favor the unchosen alternative are "dissonant" with the choice behavior. Furthermore, other things being equal, the greater the number of elements favoring the unchosen alternative (i.e., the greater the relative attractiveness of the unchosen alternative) the greater the resulting "dissonance." When "dissonance" exists, the person will attempt to eliminate or reduce it. Although space limitations preclude further discussion of the theory, it may be said that several derivations are possible concerning the consequences of making a choice. The present study was designed to test the following:

1. Choosing between two alternatives creates dissonance and a consequent pressure to reduce it. The dissonance is reduced by making the chosen alternative more desirable and the unchosen alternative less desirable after the choice than they were before it.

2. The magnitude of the dissonance and the consequent pressure to reduce it are greater the more closely the alternatives approach equal desirability.

3. Exposing a person to new relevant cognitive elements, at least some of which are consonant, facilitates the reduction of dissonance.

[1] This paper is based on a thesis offered in partial fulfillment of the requirements for the Ph.D. degree at the University of Minnesota. The author wishes to thank his advisor, Dr. Leon Festinger, for his invaluable aid in the formulation and execution of the study. He also wishes to thank the Laboratory for Research in Social Relations, which supported the study.

[2] The author is now in the Department of Psychology, Yale University.

METHOD

In order to test these hypotheses, a procedure was required in which each subject would: (*a*) rate each of a variety of objects on desirability, (*b*) choose between two of the objects rated, and (*c*) rate the desirability of each object again. Also, the extent to which the choice alternatives approached equal desirability had to be subject to control.

These requirements were met in the following way. The *S*s were asked, in the context of consumer research, to rate the desirability of each of eight manufactured articles. As payment for taking part in the research, each *S* was given a choice between two of the rated articles. After the *S* had made his choice, and with the objects then out of sight, he was asked to rate each again. Thus a measure of change in desirability was available for the chosen and unchosen alternatives, and for articles not involved in the choice.

Design and Procedure

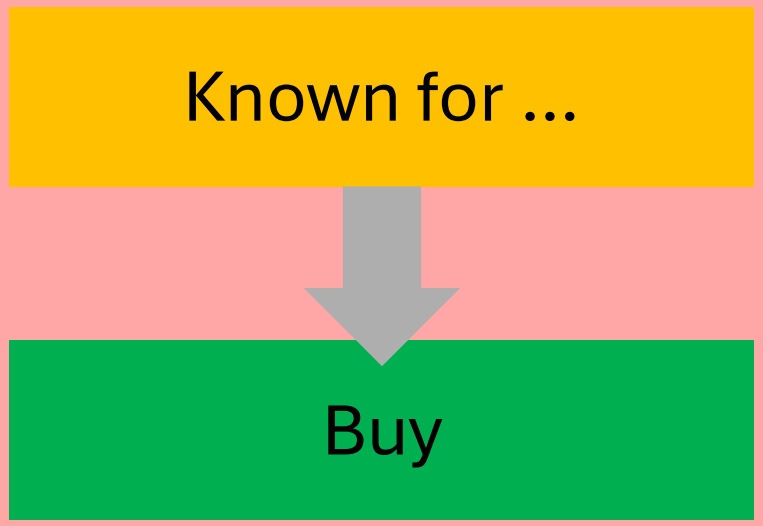
Subjects and rationale. The *S*s consisted of 225 female students, mostly sophomores, from elementary psychology classes at the University of Minnesota. The initial instructions were designed to convince *S* that she deserved, and would receive, payment for participating. Thus, *S* was told that: (*a*) the task was contract work for several manufacturers rather than a regular psychological experiment; (*b*) the experimenter and professor in charge were profiting substantially from the project; (*c*) the *S* herself was being asked to spend several more hours on the project; (*d*) for participation she would receive a product of one of the manufacturers.

The objects. After *S* agreed to participate, it was explained that there were eight manufactured articles, each of which was to be rated as to its desirability. Each object was then taken out of its box, briefly described, and shown to *S*.

The objects were new-looking and made by different manufacturers. They ranged in retail value from about $15 to about $30. They consisted of the following: an automatic coffee-maker, an electric sandwich grill, a silk-screen reproduction, an automatic toaster, a fluorescent desk lamp, a book of art reproductions, a stop watch, and a portable radio.

The rating scale. Objects were rated by marking a continuous line on which eight identifying points were spaced equally. These points were accompanied by written statements from "extremely desirable" to "defi-

Myth



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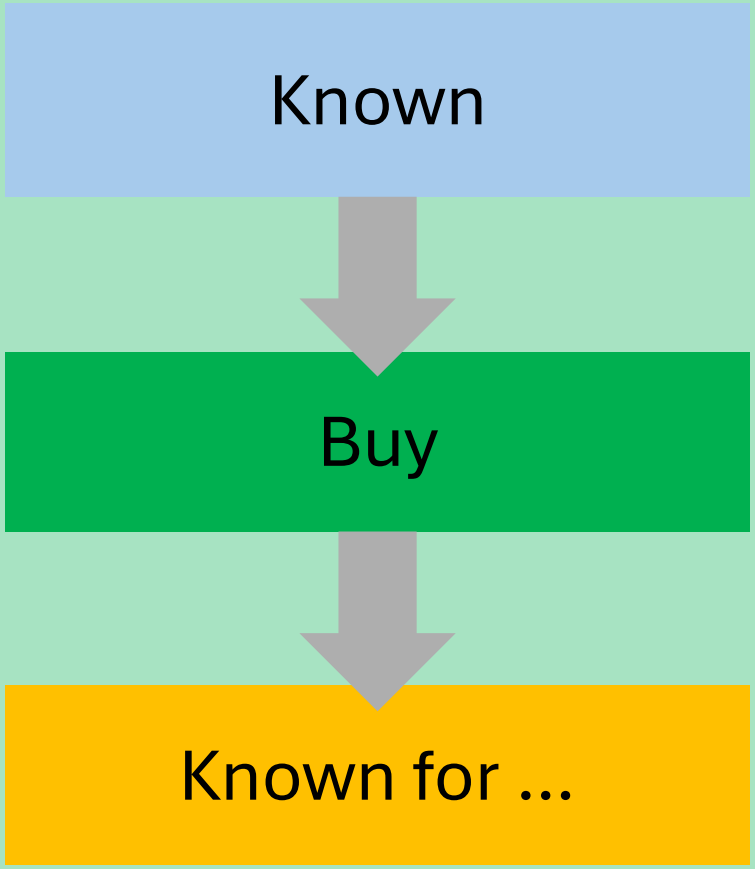

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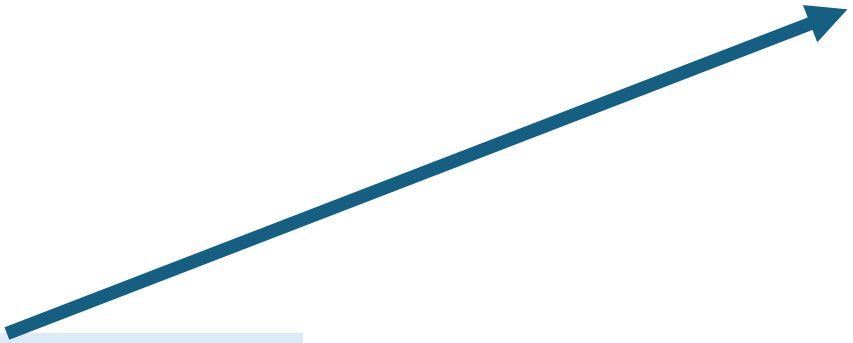

Seen?
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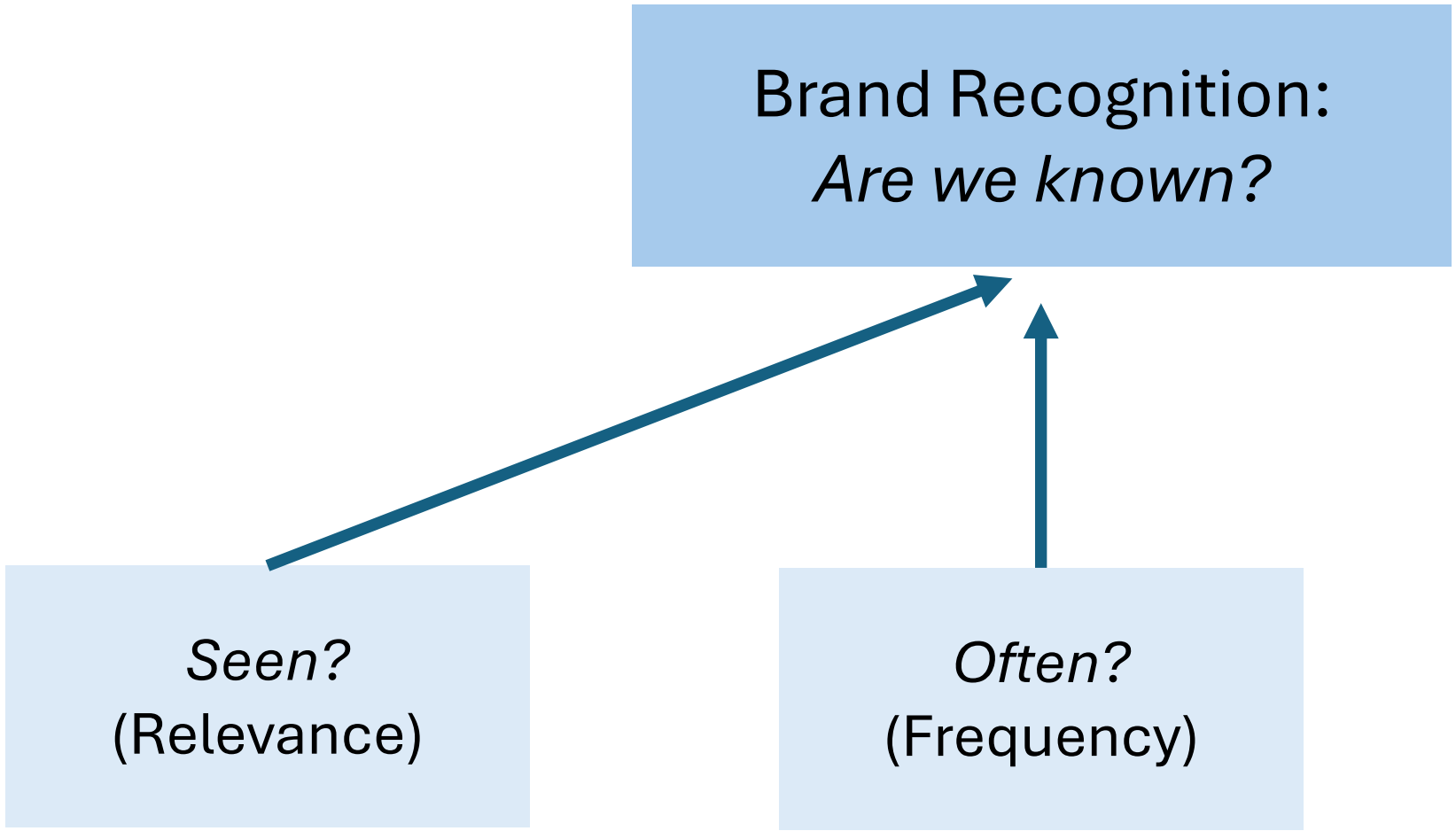
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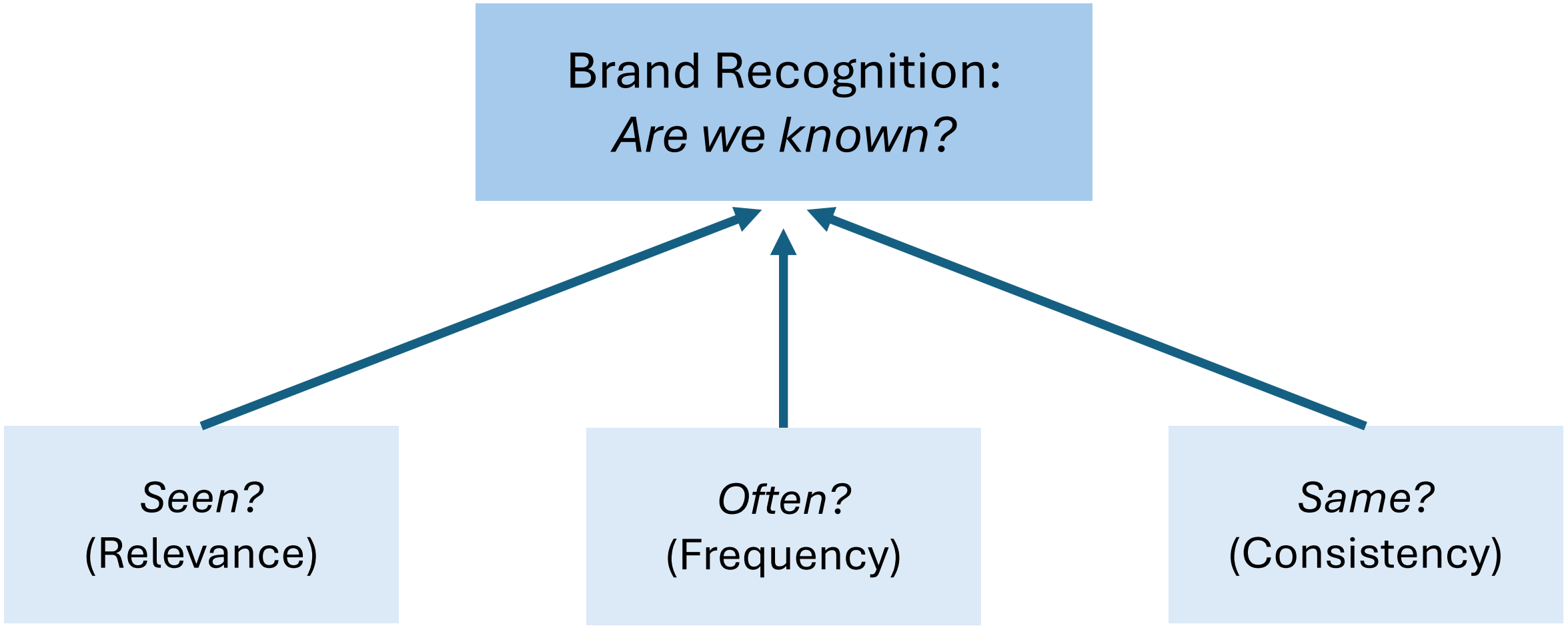
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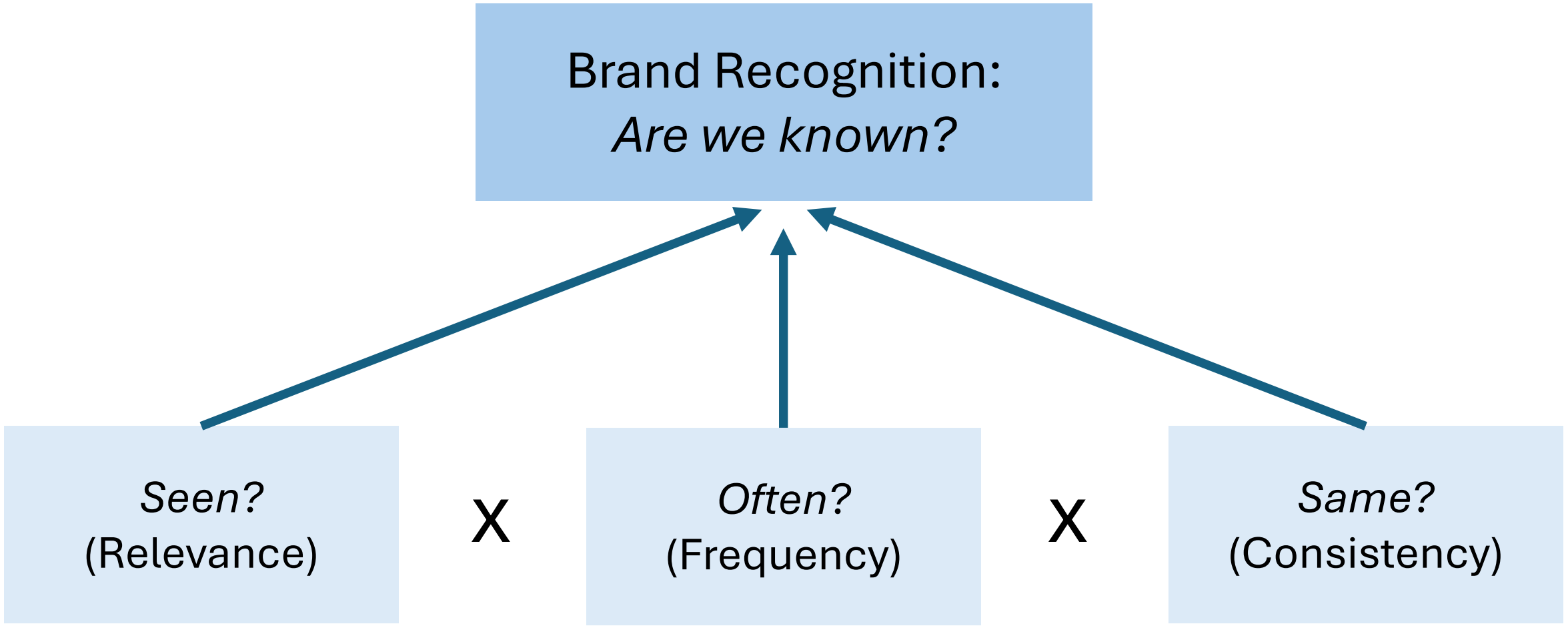
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(Consistency)

How to grow a strawberry

Prof. dr. Bart De Langhe
KU Leuven & Vlerick Business School