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The Dual Processes of the Attraction Effect and the Impacts of Accountability and Information Ambiguity

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ABSTRACT

The Dual Processes of the Attraction Effect and the Impacts of Accountability and Information Ambiguity

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There is ample evidence showing the existence of an attraction effect. This effect describes the phenomenon that a new alternative, when added to a choice set, increases the preference and choice probability of an existing alternative. The major findings reported in this area indicate that the alternative is benefited when it dominates or partially dominates the newly added item, or when it becomes the compromise choice after the addition of the new entrant. Such distortion in preference and choice has also been found to be stronger when consumers have the need to justify their choices to others.

A number of explanations for the attraction effect have been proposed. These include the use of choice rules or strategies, shifts in attribute importance and perceptions, changes in overall brand perceptions, perceptual framing of the decision problem, and consideration set memberships. Past research provides mixed results for these explanations, suggesting the need for further study in this area.

The central theme of this dissertation is the investigation of the decision process by which the attraction effect occurs. Based on the theoretical frameworks of adaptive decision behaviour and the search for reasons in choice, we postulate two basic processes

that may lead to the demonstrated attraction effect. The first, an attribute-based process, suggests that the attraction effect results from consumers' evaluations, comparisons, or any other effortful computations on attribute values. The second, a reason-based process, implies that the attraction effect results from consumers' reliance on a dominance and/or a compromise relationship contained in the choice task.

It is hypothesized that these two basic processes lead to the attraction effect directly or indirectly through their influences on relative brand evaluations. Moreover, this dissertation posits that accountability increases the impact of both attribute-based and reason-based processes on the attraction effect. In addition, several hypotheses are proposed regarding the interaction of accountability and information ambiguity on the two-way decision processes of the attraction effect.

A 2 (accountability) x 2 (information ambiguity) experimental design is conducted to test the dual processes of the attraction effect as well as the impacts of accountability and information ambiguity. The experimental data is analyzed using both, multivariate analyses of variances and structural equation models.

The findings from this research suggest that brand competition is both a race to meet consumer needs at attribute values and a battle to add distinctive cues such as a dominance relationship over the structure of consumer's choice set.

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While many have contributed to the completion of this dissertation, I admit that no research can be perfect, and I myself remain responsible for any unintended errors and weaknesses.

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Chapter 1:

Introduction

This thesis deals with the decision processes that lead to the attraction effect. This first chapter provides an overview showing the major perspectives on the impact of a new brand entry on consumer preference and choice. The objectives and importance of this research are briefly discussed. A thesis outline with a rationale for subsequent chapters is given at the end of this chapter.

1 The Impact of a New Brand Entry on Preference and Choice

Consumer researchers have shown increasing interest in context effects in choice (Glazer, Kahn, and Moore 1991; Simonson and Tversky 1992). One issue of great concern is how the addition of a new brand into a choice set affects consumer preference and choice with respect to the existing alternatives in the set (Huber, Payne, and Puto 1982).

In the past, most preference and choice models were based on the regularity principle (Luce 1959). These models all imply that, when a new brand is added, it cannot affect the choice probability of an existing alternative in the set. Over the years these

models have been criticized for the assumption of independence of irrelevant alternatives. Green and Srinivasan (1978), for example, noted that the independence property may not be a realistic assumption in many consumer behaviour contexts. In fact, there is much evidence showing that the regularity hypothesis is not generally satisfied (see, McFadden 1986).

One of the most frequently cited reasons for the violation of the regularity principle is the substitution effect (Tversky 1972), which posits that when added, a new alternative will draw more share from the similar alternatives than from the dissimilar ones. Many mathematical choice models have been proposed (e.g., Tversky and Sattath 1979; McFadden 1980; Currim 1982; Moore and Lehmann 1989) to account for the substitution effect. A good success in modeling the substitution effect has been reported in a number of studies (Kamakura and Srivastava 1984). In accordance with the substitution effect, Laroche and Brisoux (1989) found negative influences of competing (similar) brands on a focal brand's attitude and intention formations. The general assumption of the substitution effect is that a new brand cannibalizes more share from the brands to which it is similar.

Huber, Payne, and Puto (1982) first discovered the so-called attraction effect, in violation of both regularity and substitution hypotheses. Their findings show that adding an asymmetrically dominated item to a choice set increases the choice probability of the dominating (similar) item in the set. Huber and Puto (1983) extended this effect to situations involving a relatively inferior entrant. Others further confirmed the attraction effect by adding an asymmetrically dominated or a relatively inferior alternative (e.g.,

Ratneshwar, Shocker, and Stewart 1987; Mishra, Umesh, and Stem 1993; Simonson 1989; Simonson and Tversky 1992). In particular, Simonson (1989) and Simonson & Tversky (1992) demonstrated the attraction phenomenon in situations involving an extreme alternative. They found that an alternative is able to gain share when it becomes the compromise or middle option in the set.

2 Why Study the Attraction Effect ?

Consumer researchers have recently paid greater attention to the attraction effect. This interest is perhaps due to the significant theoretical and marketing implications of this effect. From a theoretical point of view, the attraction phenomenon implies that normative assumptions of consumer choice models should be revised in certain conditions. According to the traditional value maximization theory, an inferior alternative should be disregarded and should have no effect on the choice probability of the dominating alternatives (cf., Pan, O'Curry, and Pitts 1995). The observed attraction effect is contrary to this traditional assumption. In particular, as previously discussed, it contradicts the widely accepted regularity and substitution hypotheses.

Ratneshwar, Shocker, and Stewart (1987) pointed out that the presence of a significant attraction effect could call into question many current practices of product concept testing and conjoint analysis, which have, in turn, largely ignored the presence of other products in eliciting customer reactions. Thus, a better understanding of the attraction effect will enable consumer researchers to develop a more complete theory of context effects on choice (Huber and Puto 1983).

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In practice, the attraction effect could have important implications for several aspects of marketing, such as, new product design, promotion strategies, comparative advertising, and sales tactics (see, Simonson and Tversky 1992). While conventional wisdom suggests that an inferior product should not be marketed or would not exist for long if marketed, when its effect on a firm's other products is taken into account, the answer is no longer as clear (cf., Ratneshwar et al. 1987). The attraction effect may make marketers revise the traditionally held belief that an added brand cannibalizes more from an existing alternative to which it is similar. The findings reported in this area imply that a firm that develops a new-to-the world product might introduce its inferior version first in order to legitimize a new and improved subsequent version (Ratneshwar et al. 1987).

3 Why Focus on the Decision Processes of the Attraction Effect ?

While researchers have little difficulty in finding an attraction effect, the basic decision processes for this effect are relatively unexplored. Payne (1982) noted that an essential aspect of attempts to improve human decision making is understanding how individuals make decisions. Similarly, Lockhead (1980) stated that the decision processes which ultimately lead to the choice of an alternative must be studied if we want to gain adequate knowledge about human decision making. It is gradually becoming clear that human decision making cannot be understood simply by studying final decisions (Svenson 1979). In particular, what makes the issue of the attraction processes more important is that the major findings reported in this area have reflected bounded rationality of consumer preferences, which violates the commonly held assumption of value maximization in

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marketing (Simonson and Tversky 1992). To incorporate context effects in the analysis of consumer choice, we need to understand how preferences are influenced by the choice set structure (cf., Simonson and Tversky 1992). On the other hand, the development of effective marketing strategies also requires an understanding of the manner in which consumers choose among alternatives. Previous studies (Ratneshwar et al. 1987; Simonson 1989) have shown that this is fertile ground for attraction effect researchers.

4 The Objectives of the Study

Most of the previous studies investigating the attraction effect used aggregate choices as the dependent variable. As a result, much remains to be known as to the basic processes leading to the attraction phenomenon. The use of process tracing methods such as verbal protocols would be potentially useful in gaining direct insights into the reasons for the occurrence of the attraction effect. Against this background, this study attempts to improve our understanding of the decision processes or mechanisms that underlie the attraction effect.

Based on the theories of adaptive decision behaviour and the search for reasons in choice, we postulate two basic processes that may lead to the attraction effect. The first, an attribute-based process, suggests that the attraction effect results from attribute evaluations, comparisons, or any other effortful computations on attribute values. The second, a reason-based process, implies that the attraction effect results from consumers' reliance on the readily available dominance and/or compromise relationship in the choice task. As a second objective of this research, the possible impacts of accountability and

information ambiguity on the two-way decision processes leading to the attraction effect are further examined.

5 Organization of the Thesis

Chapter 2 presents a literature review of previous studies on the attraction effect. Its emphasis is on theoretical explanations for major findings reported in the area. Chapter 3 presents theoretical foundations of this study along with research hypotheses. An experimental study is detailed in Chapter 4. Chapter 5 provides data analyses and results. Finally, research conclusions and implications are presented in chapter 6.

Chapter 2:

Previous Research on the Attraction Effect

1 What Is the Attraction Effect ?

As defined by Huber, Payne, and Puto (1982), the attraction effect refers to an increase in the probability of consumer choice of the dominating alternative when an asymmetrically dominated alternative is introduced to the choice set. An asymmetrically dominated alternative is dominated by at least one alternative in the choice set and not dominated by at least one other. The attraction effect can be illustrated by the example from Johnson and Puto (1987): "One choice set consists of two initial restaurants A and B. Restaurant A has a driving time of 5 minutes and a 3-star quality rating whereas restaurant B has a driving time of 25 minutes and a 5-star rating. Adding alternative C, which has a driving time of 35 minutes and a 4-star quality rating (clearly dominated by restaurant B on both dimensions), will increase the choice probability for B and decrease it for A."

As previously mentioned, Huber et al. (1982) first observed the attraction effect using choice sets in which there is a dominance relationship. Huber and Puto (1983) extended this effect to situations involving the addition of a relatively inferior alternative. They showed that the attraction effect can also occur if a choice set includes a nearly-dominated option. Simonson (1989) further reported the existence of the attraction effect even with a choice set consisting of no dominance or near-dominance relationship. Specifically, he found that an alternative is able to gain market share when it becomes a middle option after the addition of a new alternative. As he explained, the middle option is perceived as a compromise choice, thus safer or less risky.

Figure 1 is a diagrammatic representation of the attraction effect observed by previous researchers:

Figure 1
Diagrammatic Illustration of the Attraction Effect
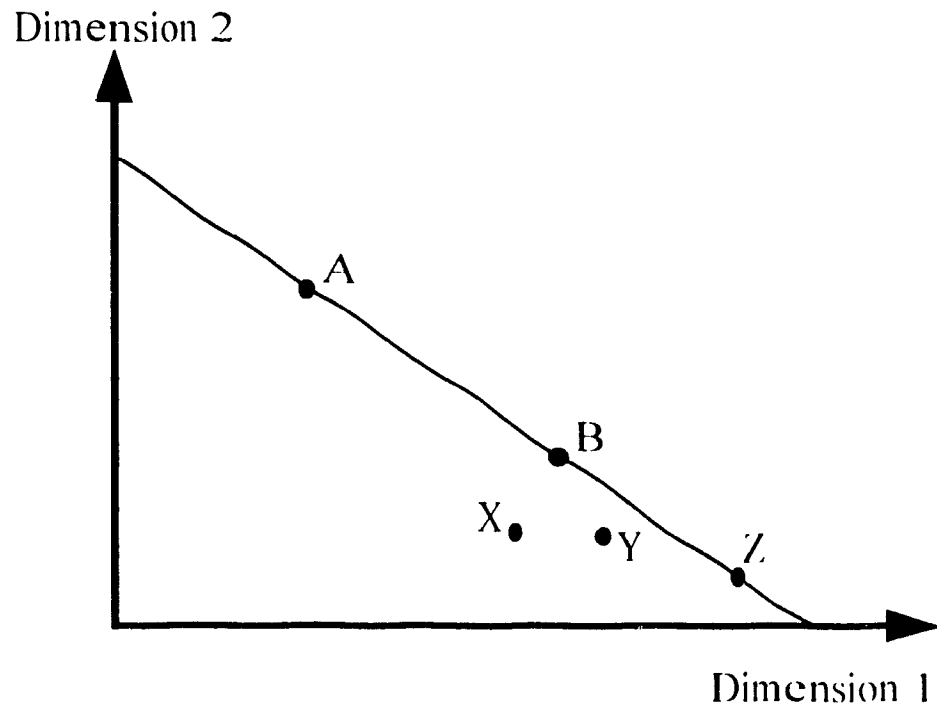
Brand A = Competitor; Brand B = Target; Core set = Brands A and B;

Set with an asymmetrically dominated alternative = Brands A, B, and X;

Set with a relatively inferior alternative = Brands A, B, and Y;

Set with a compromise alternative = Brands A, B, and Z.

Brand A and B constitute the original core choice set if only these two brands are present initially. Notice that neither A nor B dominates the other since each is superior on at least one dimension. These two brands are referred to as non-dominating alternatives. Brand X is considered to be an asymmetrically dominated alternative because it is inferior to B on both dimensions but is better than A on the dimension 1. Such a brand X is more similar to brand B than to brand A, thus, B is called the target and A is called the competitor. The rectangular area which comprises brand X (Figure 1) is the region of asymmetrically dominated alternatives (by brand B), whereas the triangular area which comprises brand Y is the region of relatively inferior alternatives. While alternatives from this region such as brand Y cannot be called "inferior" in an absolute sense without knowing an individual's taste, they are "less desirable" in that they merely reflect a relatively worse tradeoff on the dimensions in switching from B to Y than that obtained by switching from A to B (cf., Huber and Puto 1983). The compromise structure of the decision context can be represented by the choice set consisting of brands A, B, and Z, in which the target B is considered as a compromise option.

To summarize, the attraction effect occurs if the introduction of an asymmetrically dominated alternative X, a relatively inferior alternative Y, or an extreme alternative Z (Figure 1) increases the choice probability of the target B at the expense of the competitor A. In a broader sense, the attraction phenomenon refers to the positive impact of a new brand entry on preferences of existing alternatives in a choice set.

2 Empirical Evidence

The attraction effect has been observed in a number of studies using a variety of stimuli including consumer products, gambles, and political candidates.

To test the attraction effect, Huber et al. (1982) conducted a within-subject experiment involving six product categories (cars, restaurants, beer, lotteries, film, and TV sets). For each product class, student subjects were first presented with a core choice set which consisted of two non-dominating brands and each brand was defined on two attribute dimensions, such as A and B in Figure 1. Then, they were asked to choose the most preferred brand from the given choice set. Two weeks later, the same subjects were presented with a three-alternative choice set for each product class. The new choice set included the two original brands and a third brand. The newly added brand was manipulated in the way that it was fully dominated by brand B but not by brand A, such as X in Figure 1. Thus, B is the target, A is the competitor, and the new entrant X is the asymmetrically dominated brand. In this case, the addition of the new brand X constitutes full dominance structure in the three-alternative choice set (A, B, and X). An example of the choice sets used by Huber et al. (1982) is given below:

Sample Choice Situation

| | Beer | |
	Price/sixpack	Quality rating (100 = best)
Brand A (Competitor)	$1.80	50
Brand B (Target)	$2.60	70
Brand X (Decoy)	$3.00	70

As before, subjects were instructed to make a brand choice from each of the three-alternative sets provided. By comparing the choice data between the before- and after-entry conditions, Huber et al. showed a significant shift of choice in favour of the dominating brand B at the expense of the competitor A. This pattern is held across the six product categories examined.

Using a between-subject design, Huber et al. (1982) found similar results. Specifically, half of the subjects were told to make a choice from the core set constituting brands A and B, while the other half were asked to choose a brand from the choice set consisting of, in addition to A and B, a new brand X (Figure 1). They reported that a significant number of subjects switched from the competitor A to the target B than vice versa due to the addition of the asymmetrically dominated alternative. Again, the results are similar over product classes.

Huber and Puto (1983) provided further support for the attraction effect by introducing a relatively inferior brand to a core choice set. Results from within- and between-subject analyses showed that the choice probability of the target stimulus significantly increases as the new brand is added. Moreover, Huber and Puto extended the core choice set to include three alternatives, and each alternative was described on three dimensions. Similarly, the added decoy was positioned to be relatively inferior to one of the existing alternatives in the core set. The following tabulation presents an example of the extended choice sets used by Huber and Puto (1983):

Sample Extended Choice Situation

	Cars		
	Ride Quality (100 = best)	Acceleration (seconds from 0 to 50 mph)	Mileage in city driving
Competitor I	60	10	21
Competitor II	50	9	21
Target	50	10	24
Decoy	40	11	27

Notice that neither brand dominates the other in the core set (two competitors and target), and the addition of the decoy makes the target become the middle or compromise option. Though the increasing complexity of the choice task, Huber and Puto also

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observed the attraction effect by investigating the preference shifts between the before- and after-entry of the new brand. The results were confirmed for several product categories.

In a series of experiments. Simonson and Tversky (1992) replicated the previously observed attraction effect using relatively more realistic stimulus materials. In one experiment, half of the subjects were given two brands of microwave ovens, whereas the other half were presented with these two brands with a third brand added to the set. The choice alternatives were described in a fashion similar to that used in Consumer Reports, which is shown in the tabulation below:

Brand A: Emerson: .5 cu. ft.; regular $109.99; sale price 35% off

Brand B: Panasonic I: .8 cu ft.; regular $179.99; sale price 35% off

Brand X: Panasonic II: 1.1 cu. ft.; regular $199.99; sale price 10% off

Notice that neither brand A nor B dominates the other. Brand X was positioned close to B but in a fashion so that it was relatively less attractive since the selection of B seemed to be a bargain (10% off vs. 35% off). Their results showed that the choice share of brand B in the three-alternative set was significantly higher than that in the two-alternative set (A and B). That is, adding the weak brand (X) to the core set (A and B) "helps" the strong brand (B).

In another experiment. Simonson and Tversky (1992) demonstrated the attraction phenomenon using a choice set involving alternatives across product categories. In the first situation, subjects were offered two brands of paper towels and one brand of facial tissues.

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while in the second situation they were given one brand of paper towels and two brands of facial tissues. As manipulated by the researchers, the quality of one of the samples in the category with two options was superior to that of the other. That is, a dominance relationship existed between the two brands of paper towers in the first case, and between the two brands of facial tissues in the second case. It was found that the dominating brand in each case was a clear winner. Specifically, a significant number of subjects chose the high quality paper tower and high quality facial tissue when they dominated another option in the same category.

In the third experiment of Simonson and Tversky's study, subjects were asked to trade the $6 they received for a pen. Some of the subjects were only presented with an elegant Cross pen, while the others were given an additional pen with a lesser known brand name. Consistent with the attraction effect prediction, the researchers found that the inclusion of the less attractive pen increased the proportion of choices in favour of the more attractive Cross pen.

Using real brands of cameras taken from the Best catalog, Simonson and Tversky provided further support to the attraction effect. The stimuli used in this experiment were 35mm Minolta cameras. In one case, subjects saw two pictures of cameras presented along with a full description of functions and prices. In the other case, a third camera was added. The newly added camera was a top-level model, and the addition of it made one of the two existing brands become the compromise or middle option. Their results showed that the choice share of the middle option significantly increased at the cost of the other existing camera (i.e., the competitor).

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Pan, O'Curry, and Pitts (1995) investigated a more complex and "real world" choice setting which involved the choice of political candidates in the 1994 Illinois State Primary election and the 1992 U.S. Presidential election. Two experiments were conducted, respectively, for the two election events within the context of the attraction effect. For the Illinois State Primary election, two and three major social issues were used as bases to choose the candidates. An asymmetric dominance structure in the three-candidate choice set was manipulated on the basis of the media reports. Subjects were asked to choose their candidates from either a choice set consisting of two major non-dominating candidates or a set with an asymmetrically dominated candidate added. Pan et al. demonstrated that the candidate had significantly benefitted when he dominated another candidate in the election. The findings are consistent with the attraction effect phenomenon. For the U.S. Presidential race, the three candidates considered were Clinton, Bush, and Perot. In this case, an asymmetric dominance structure was not objectively manipulated but subjectively developed by subjects themselves. Subjects were asked to rate the desirability of each of the three candidates on two major issues -national defence and health care. On the basis of their responses, subjects were classified into seven groups with different perceptual structures of choice sets: Bush dominates Clinton, Bush dominates Perot, Clinton dominates Bush, Clinton dominates Perot, Perot dominates Bush, Perot dominates Clinton, and no asymmetric dominance. As expected, Pan et al. showed that the dominating candidate significantly gained market share as compared with the situation with no asymmetric dominance structure. Again, the results provide support for the attraction effect. In general, the findings by Pan et al. indicate that: (1) the attraction effect is not

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limited to a consumer choice context, and (2) an asymmetric perceptual dominance structure produces similar choice outcomes consistent with the attraction effect as an objective dominance choice set manipulated by researchers.

In addition, there is also evidence showing the attraction effect for gambles (Tversky et al. 1988), job candidates (Sattath 1989), as well as other consumer products, including personal computers, dental insurance, CD players, and stereo speakers (Simonson and Tversky 1992; Lehmann and Pan 1994). With gambles, for example, Tversky et al. (1988) showed that gambles were more preferred when they dominated another than when they did not.

In summary, the attraction effect has been observed in broad stimulus contexts. For consumer goods, the reported findings in the area involve product categories ranging from low to high levels of involvement, and from fictitious brands to "real-world" stimuli. The presence of asymmetric dominance, near-dominance, or compromise relationship in a choice set is a necessary condition for the attraction effect to occur. Given the existing evidence, Simonson (1989) concluded by remarking that "the phenomenon of the attraction effect is real, rather than an artifact of any particular experimental stimuli or manipulation."

There are several points that are worth researchers' attention. First, the decision contexts of the attraction effect are relatively simple, involving usually two or three alternatives that differ on just two or three, somewhat arbitrarily selected, attribute dimensions. Second, the choice set structures used for the study of the attraction effect are commonly objective rather than subjective. Third, most studies have focused on the

attraction effect at the aggregate level. Finally, the attraction effect phenomenon is widely observed in laboratory settings.

3 Explanations for the Attraction Effect

While previous researchers have little difficulty in showing the attraction effect, relatively little has been known about the causes. The speculated reasons for this effect include perceptual biases in attribute importance and brand judgments, perceptual framing of the decision problem, the use of choice rules or strategies, need to justify, and changes in consumers' consideration set membership.

3.1 Perceptual Biases in Attribute Importance and Brand judgments

Huber, Payne, and Puto (1982) proposed that the attraction effect might be the result of perceptual distortions in attribute weights due to range and frequency effects. Pan and Lehmann (1993) advanced this idea by showing the impact of new brand entry on overall brand perceptions.

3.1.1 Range and Frequency Effects

Range and frequency effects on perceptual judgments were originally described by Parducci (1974). The range effect represents the idea that extending the range of two stimuli on a particular dimension will decrease the perceived difference between the two stimuli on that dimension, whereas the frequency effect refers to the notion that increasing the number of alternatives between two stimuli along a specific dimension will increase the perceived difference between the two stimuli on the same dimension.

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Along with their tests of the attraction effect, Huber et al. (1982) systematically examined the range and frequency hypotheses as explanations for the observed findings. They used several choice sets for each product in which the decoy's locations were varied. Table 1 provides the choice sets for beer, which are representative of the stimulus materials used by the authors. Figure 2 is a graphical description of the decoy's locations for each choice situation.

Table 1
The Choice Situations for Beer
(A Test of Range and Frequency Effects)

	Price/sixpack	Quality rating
Range increasing (R)		
Target	$1.80	50
Competitor	$2.60	70
Added decoy	$1.80	40
Extreme range increasing (R')		
Target	$1.80	50
Competitor	$2.60	70
Added decoy	$1.80	30
Frequency increasing (F)		
Target	$1.80	50
Competitor	$2.60	70
Added decoy	$2.20	50
Range-frequency (RF)		
Target	$1.80	50
Competitor	$2.60	70
Added decoy	$2.20	40

Figure 2
A Graphical Description of the Choice Situations for Beer
(A Test of Range and Frequency Effects)
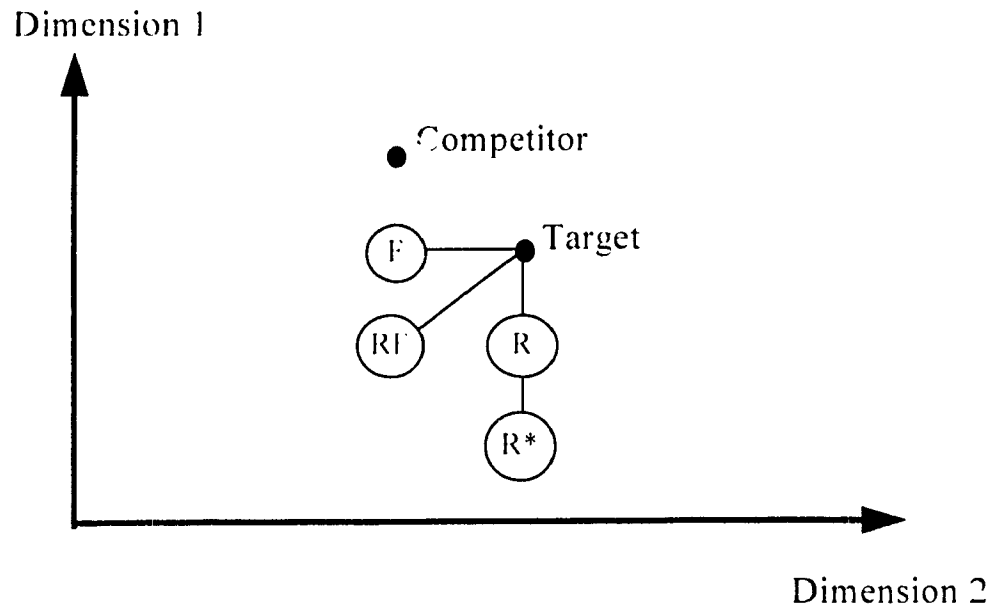
Notice that the added decoy in each of the four choice situations (i.e., range increasing, extreme range increasing, frequency increasing, and range-frequency) is asymmetrically dominated by the target brand. In the first situation, the decoy (R)

increases the range of the dimension on which the target brand is weaker. Compared to R, the decoy (R') in the second situation is more extreme which causes a larger range increase. The decoy (F) in the third case increases the frequency of stimuli along the dimension on which the target is superior. And finally, the decoy (RF) in the forth situation simultaneously increases the range of the dimension on which the target is inferior and increases the frequency on which it is superior.

Consistent with the range effect, Huber et al. (1982) expected that increasing the range of the dimension on which the target brand is inferior decreases the importance of a fixed difference on that dimension. Referring to the first choice situation of Table 1, for example, the range of quality rating between target and competitor is 20 points, and this range increases to 30 points after adding the decoy (R). Huber et al. predicted that such an extension will make the 20-point difference between target and competitor look less extreme or smaller, and as a result, lead to the attraction effect. In a similar logic, they hypothesized that the more extreme decoy (R') would produce a greater perceptual distortion in favour of the target, as compared to the less extreme decoy (R). Consistent with the frequency hypothesis, Huber et al. expected that the frequency increasing decoy (F) has the potential of shifting subjects' attention and thus weight given to the dimension on which the target is superior. According to them, this weight shifting drives the attraction effect.

While the hypothesized attraction effect was generally obtained by Huber et al., there was little support to the range explanation for the findings. Specifically, the extreme range increasing decoy (R') had no greater biasing power on preference shifts than the less

extreme decoy (R). Similar results were also reported by Huber and Puto (1983). They found that the greater range extension had no significant impact on the magnitude of the attraction effect. These results led Huber and Puto (1983) to conclude that range extension explanation may not be sufficient to account for the attraction effect.

Huber et al. (1982) also found no support for the frequency hypothesis as the choice share of the target was not significantly affected by the addition of the frequency increasing decoy. In addition, the combination of range-frequency decoy (RF) produced only a somewhat significant attraction effect. The results suggests that weight shifting may not be a key driving force for occurrence of the attraction effect. Pan and Lehmann (1993) provided a more direct test for the weight change explanation. They computed the ratio of the importance rating on attribute 1 to that on attribute 2. The within-subjects difference in the weight ratio between before and after adding a decoy was compared, but no significant difference was found for each of the four decoy conditions they manipulated. They further tested the pattern of weight shifting using a regression model. Again, there was no significant relative shifts of weights across various decoy conditions.

However, Pan and Lehmann provided much evidence showing that the attraction effect can be accounted for by changes in brand perceptions due to the addition of a range or frequency increasing decoy. Table 2 gives the choice tasks used in their study.

Table 2
Positions for Existing and New Brands on Testing
Range and Frequency Effects

Calculator Battery

	Expected Life (hours)	Price/pair ($)
Competitor (A)	29	3.25
Target (B)	20	2.15
Range Entrant (R)	16	1.60
Frequency Entrant (F)	24	2.70

Compact Sedan

	Fuel Efficiency (mpg)	Acceleration (seconds to reach 60 mph)
Competitor (A)	29	10
Target (B)	38	14
Range Entrant (R)	42	16
Frequency Entrant (F)	34	12

Light Bulb

	Expected Life (hours)	Light Output (lumens)
Competitor (A)	750	1200
Target (B)	1050	850
Range Entrant (R)	1200	675
Frequency Entrant (R)	900	1025

TV set

	Durability	Screen Resolution (lines)
Competitor (A)	84	285
Target (B)	60	375
Range Entrant (R)	48	420
Frequency Entrant (F)	72	330

Notice that the entrant R in each product category is in fact a relatively inferior brand, and the entrant F is a compromise choice (i.e., middle option). As it was positioned, brand R is a range-extension decoy, whereas F is a frequency-increasing decoy. To apply range and frequency hypotheses to both attributes, Pan and Lehmann proposed that, when a new brand enters outside two existing brands, the two existing brands are perceived to be more similar (range effect); and when a new brand enters between two existing brands, the two existing brands are perceived as less similar (frequency effect).

The data from both within- and between-subjects experiments showed consistent support for the range and frequency prediction in brand perceptions. More importantly, it was found that the perceptual changes due to range and frequency manipulations were comparable to the shifts in brand preference and choice. Moreover, the latter results were consistent with a previously observed attraction effect. The findings suggest that a new brand entry is able to alter perceived similarity of existing alternatives in the choice set, and the latter causes an attraction effect. These results seem robust as Pan and Lehmann used different types of measures for similarity judgments, brand preference, and choice. Additionally, they also employed different methods in their analyses.

To summarize, the empirical results reported by previous researchers show that the attraction effect can be accounted for by changes in brand perceptions (i.e., similarity judgments), but not by shifts in attribute importance. Perceptual biases in brand judgments due to an added decoy are consistent with range and frequency effects.

3.1.2 Categorization Effect

Pan and Lehmann (1993) also proposed that a new brand entry may have an impact on brand perceptions through a categorization effect. As they hypothesized, if a new brand is positioned near an existing brand, thereby forming a subgroup, the existing brand would be perceived as more similar to the new entrant and less similar to other existing brands in the choice set. As a result, the dominated brand within the subgroup loses in comparison to the existing brand (Carpenter and Nakamoto 1989). Pan and Lehmann reported empirical evidence confirming the hypothesized categorization effect in brand perceptions. Moreover, they showed that the decoys used for categorization manipulation significantly change brand preference and choice in favour of the target stimulus. The results seem to suggest that changes in brand perceptions due to categorization effect can be used to explain previously observed attraction effects in some cases.

Kardes, Herr, and Marlino (1989) provided another piece of research which focused on the categorization processes of brand perceptions within the context of the attraction effect. The authors suggested that assimilation in brand judgments would lead to substitution in choice and that contrast in judgments would lead to attraction. Assimilation occurs when a new item is positioned close to other items, and contrast occurs when a new item is positioned far away from other items (Higgins and King 1981). On the basis of these context effects in perceptual judgments, Kardes et al. hypothesized that a moderately discrepant inferior decoy would make the target brand less attractive (assimilation), and an extremely discrepant inferior decoy would make the target more attractive (contrast).

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To test their expectations, Kardes et al. (1989) conducted a between-subject experiment in which four decision contexts were manipulated for the product category of beer: moderately discrepant decoy, extremely discrepant decoy, no decoy, and target brand only. These choice situations are depicted in the following tabulation.

	Beer	
Condition 1	Price/sixpack	Taste quality (100 = best)
Brand A (competitor)	2.80	50
Brand B (target)	4.75	85
Decoy C (moderately discrepant)	4.50	80
Condition 2		
Brand A (competitor)	2.80	50
Brand B (target)	4.75	85
Decoy D (extremely discrepant)	4.50	65
Condition 3		
Brand A (competitor)	2.80	50
Brand B (target)	4.75	85
Condition 4		
Brand B (target)	4.75	85

Decoy C in Condition 1 was positioned moderately inferior to the target brand, as compared to decoy D in Condition 2. These two decoys were used to test assimilation and contrast effects, respectively. The other two decision contexts were used as control conditions. Kardes et al. compared subjects' attitudinal judgments and choices across the four experimental conditions. While the authors had little trouble finding context effects in both judgments and choices, the direction of the effects was not as they expected. Specifically, a contrast effect in attitudinal judgment and a substitution effect in choice were in fact found when a assimilation effect was anticipated. And, neither contrast nor attraction effects were observed when a contrast effect was expected. These findings cast doubt on the mediating role of assimilation and contrast effects in producing substitution and attraction effects (Herr and Kardes 1989).

In short, the existing results show that in some cases the categorization processes in brand perceptions are related to the attraction effect. Nevertheless, more rigorous tests are still needed.

3.2 Extremeness Aversion

Simonson and Tversky (1992) suggested that consumers have the tendency to prefer alternatives that are not extreme. This is known as the extremeness aversion hypothesis According to the authors, extremeness aversion has the potential to explain the attraction phenomenon, particularly within the context where one alternative is positioned as a middle option.

The extremeness aversion hypothesis extends the notion of loss aversion (Tversky

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and Kahneman 1991). Loss aversion has its roots in prospect theory (Kahneman and Tversky 1979, 1982; Tversky and Kahneman 1981). Prospect theory, as a psychologically based descriptive theory of individual choice under risk (Puto 1987), deals with the effects of decision frames on choices. This theory generally assumes that in the decision context an individual identifies a reference point (i.e., the standard of comparison) and then evaluates the alternatives as gains or losses relative to the reference point. The general proposition of prospect theory is that the decision maker tends to be risk-averse for choices involving gains (positive frame) and risk-taking for choices involving losses (negative frame). The literature contains numerous examples of choice reversals for decision problems that are identical except for the way in which they are framed. The classic example is the dramatic choice reversals due to switching the decision frame from lives saved to lives lost (see, Kahneman and Tversky 1979). In their reference-dependent theory of consumer choice, Tversky and Kahneman (1991) recently presented much evidence showing that choice depends on reference level: changes of reference point often lead to reversals of preference.

Prospect theory has been applied to the marketing and consumer behaviour contexts (Puto 1987; Weiner, Gentry, and Miller 1986). In particular, over the last few years, a considerable amount of research has focused on the subject of reference prices and has examined how consumer choice is affected by decision frames (e.g., Blair and Landon 1981; Kalwani et al. 1990; Liefeld and Heslop 1985; Mayhew and Winer 1992; and Urbany, Bearden and Weilbaker 1988). In these marketing applications, researchers have generally found support for the prospect theory. For example, Puto et al. (1985) have

explored industrial buyers' choices as a function of the way they framed the buying decision problem. Consistent with prospect theory, reference points that emphasized gains were accompanied by risk-averse choices and reference points that emphasized losses were accompanied by risk-taking choices. Rowe and Puto (1987) reported similar findings in an experiment involving consumers' choices of retail stores. Subjects who framed the choice as a gain tended to choose the guaranteed option and subjects who framed the choice as a loss tended to choose the risky option.

In price perception research involving prospect theory, consumers are assumed to be asymmetric in their responses to the purchase price in that they are more sensitive to a loss than to a gain. In fact, Gurumurthy and Little (1988) found that losses and gains with respect to the reference price had significant and asymmetric effects on choice probabilities. Putler (1989) and Kalwani et al. (1990) also found asymmetric reference price effects for gains and losses. Krishnamurthi et al. (1992) investigated whether consumers exhibit asymmetry (i.e., different sensitivity) to negative ("loss") and positive ("gain") differences between the reference price and the purchase price in brand choice. They found that consumers loyal to a brand responded to gain and loss with the same sensitivity in brand choice decisions. Contrary to prospect theory, they showed that consumers not loyal to any brand responded more strongly to gains than to losses. The authors explained that these consumers might have been motivated to obtain a good deal rather than avoid paying more than they normally would have payed for the product.

The above studies all focused on the influence of internal reference price on purchase probabilities. Internal reference price has very important implications for

purchase evaluations (e.g., perceptions of the value of the deal and attitude toward the deal) because this internal reference price serves as a neutral comparison point (or range) such that prices above it are evaluated negatively and prices below it are evaluated favourably (Monroe 1990; Thaler 1985). The price that the consumer expects to encounter for the brand, or thinks is normal or fair for that brand, serves as the internal reference price (Mayhew and Winer 1992). Blair and Landon (1981), Liefeld and Heslop (1985), and Urbany, Bearden and Weilbaker (1988) all tested external reference prices in a retail advertising context. The three studies found, respectively, that external reference prices decrease search behaviour, increase estimates of retailers' regular prices, and increase the perceived value of the offering.

Mayhew and Winer (1992) presented an empirical comparison of the relative impact of internal and external reference prices on brand choice. They found that both internal and external reference prices had significant effects on purchase probabilities. Also, in accordance with prospect theory, losses had a greater effect on probabilities of purchase. Thus, Mayhew and Winer concluded that consumers may use multiple reference points in evaluating price in purchase decisions.

In general, there is substantial evidence showing the effect of decision framing on price perceptions. The reported findings are in accordance with prospect theory.

On the basis of prospect theory, Tversky and Kahneman (1991) proposed the notion of loss aversion, which suggests that the same difference between two options will be given greater weight if it is viewed as a difference between disadvantages (relative to a reference point) than if it is viewed as a difference between two advantages. Simply

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speaking, the notion means that losses (outcomes below the reference state) loom larger than corresponding gains (outcomes above the reference state).

Consider, for example, the decision tasks in Figure 3 (adopted from Tversky and Kahneman 1991):

Figure 3
A Graphic Demonstration of Loss Aversion

Dimension 2

S*

Y

R*

T   R   X

S

Dimension 1
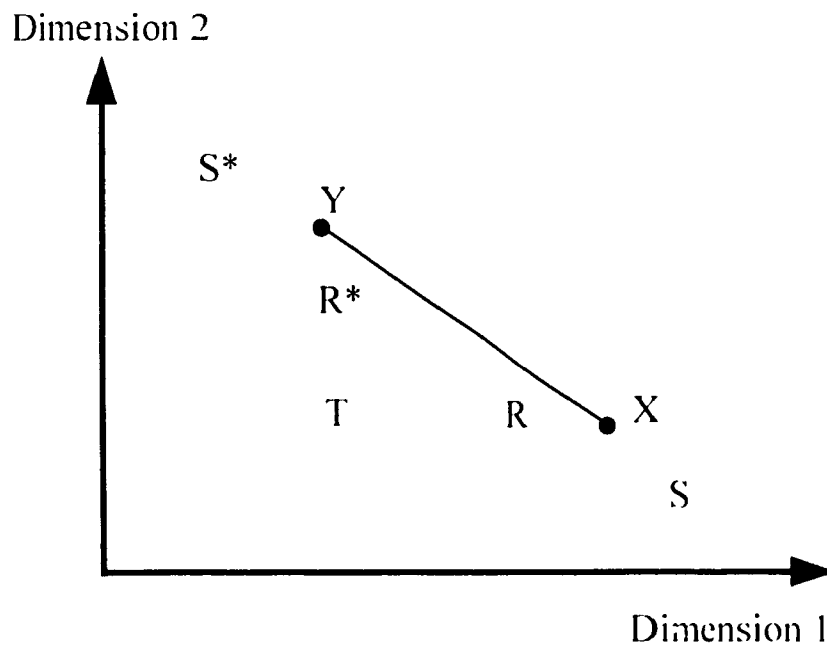
According to the loss aversion hypothesis, a person who is indifferent between brand X and brand Y from the alternative T will prefer X over Y from the reference point R, and Y over X from the reference point R', because the difference between X and Y in dimension 1 involves disadvantages relative to R and advantages relative to R*. A similar argument applies to dimension 2. Moreover, the notion of loss aversion can also be applied to evaluations of alternatives which differ from the reference point on two dimensions. In the representation of Figure 3, for instance, when alternatives X and Y are evaluated from the reference point S (or S'), the decision problem is that a combination of a small gain and a small loss is compared with a combination of a large gain and a large loss. According to loss aversion hypothesis, X is more likely to be preferred over Y from the reference point S. The relation is reversed when the same alternatives are evaluated from the reference point S*. The empirical results in Tversky and Kahneman's article provide strong support for the principle of loss aversion.

It can be shown that, if any of the four reference points (i.e., R, R*, S, and S*) is considered as an added new brand, and the two alternatives X and Y as the existing options, the preference pattern derived from the notion of loss aversion is consistent with the previously reported attraction effect. In fact, extremeness aversion focuses on advantages and disadvantages of an alternative that are defined in relation to the other alternatives under consideration, rather than in relation to a neutral reference point. Consistent with loss aversion hypothesis, Simonson and Tversky (1992) suggested that disadvantages loom larger than the respective advantages, and thus, people tend to avoid extreme options and favour intermediate ones. It can be seen that middle options have only

small disadvantages in relation to other extreme alternatives, therefore, are perceived as safer, less risky, or compromise choices (Huber and Puto 1983; Simonson 1989). Empirically, it has been found that the addition of a brand to a choice set of two non-dominating brands increases the choice share of the adjacent brand relative to the share of the nonadjacent brand (Simonson and Tversky 1992; Simonson 1989). However, there is no direct evidence showing that the observed results are due to perceptual framing of the decision problem as the shift in choice pattern was analyzed only at the aggregate level.

In summary, extremeness aversion hypothesis derives from the notion of loss aversion and suggests that people have the tendency to choose an alternative that does not stand in an extreme position (in terms of attribute values). Though a strong support for consumers' preferences toward middle or compromise options, it is not clear yet whether the preference pattern is the result of perceptual bias derived from the extremeness aversion hypothesis. We believe that individual level, protocol data are potentially useful for a better understanding of the hypothesized mechanism.

3.3 The Use of Decision Rules or Strategies

In addition to the perceptual explanations for emergence of the attraction effect, researchers have also suggested that the use of certain decision rules might distort the choice in favour of the target stimulus when a new brand is added. A number of alternative rules have been proposed, including counting the "number of wins", relative attribute comparison, tradeoff contrast, and salience of value difference.

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3.3.1 Counting the "Number of Wins"

The idea of "counting noses" for the attraction effect is suggested by Huber, Payne, and Puto (1982). This decision rule suggests that each brand is compared with all other brands in the choice set on an attribute-by-attribute (or within-attribute) basis and the brand with the most wins will be chosen.

Consider, for example, the decision context where there are two non-dominating alternatives and a third asymmetrically dominated alternative, such as A, B, and X in Figure 1. According to Huber et al. (1982), consumers in such decision situation may rank the available options on one attribute dimension at a time, and then count the number of wins on both dimensions. It can be seen that the rank order of the three alternatives along dimension 1 is: B (target) > X (decoy) > A (competitor), while the rank order along dimension 2 is: A (competitor) > B (target) > X (decoy). If the number of attribute wins determines brand preferences, then the target is a clear winner in this situation.

It should be noted however, that the counting rule cannot explain all instances of the attraction effect, only that it may explain the attraction phenomenon in some cases, particularly within an asymmetric dominance context as highlighted above.

3.3.2 Relative Attribute Comparison

Huber and Puto (1983) introduced another decision rule, namely relative attribute comparison. This rule describes that the consumer is assumed to use one brand as an anchor and then to calculate a gain and a loss on attribute values by switching from the anchor to other alternatives in the choice set. Consider, for example, the following choice

situation manipulated by Huber and Puto (1983)·

Beer		
	Price/sixpack	Quality rating (100 = best)
Brand A (competitor)	$2.60	70
Brand B (target)	$1.80	50
Brand Y (decoy)	$1.60	40

Notice that brand Y is a relatively inferior decoy, and brands A and B are two non-dominating alternatives. According to relative attribute comparison, a person starts to use the decoy Y as an anchor, then s/he computes the relative merits of the other two brands in the set. It is easy to see that a switch to the target gains 10 points in quality at an additional cost of only 20 cents, while a switch to the competitor gains 30 points at the higher incremental cost of 100 cents. Thus, the competitor looks less desirable in comparison to the target. Huber and Puto argued that this decision rule may explain the emergence of the observed attraction effect in most cases.

The rule of relative attribute comparison implicitly assumes that the consumer involves "mental arithmetic" calculation of transactions. A theoretical basis of this perspective seems the transaction utility theory (Thaler 1980; 1985). Transaction utility theory incorporates many of the principles of prospect theory. Like prospect theory, transaction utility theory seeks to explain contextual effects on choices It assumes that

individuals first evaluate potential transaction and then either approve or disapprove each potential transaction (Thaler 1985). Thaler distinguished between acquisition utility, which comes from the need-satisfying attributes of the product. and transaction utility, which depends solely on the perceived merits of the exchange. For a multiattribute option, an individual is hypothesized to set up a mental account that specifies the advantages and the disadvantages associated with the option, relative to a multiattribute reference point. The overall value of the option is given by the balance or tradeoff of its advantages (gains) and its disadvantages (losses) in relation to the reference point. Thus, the option is acceptable if the value of its advantages are greater than the value of its disadvantages (see, Kahneman and Tversky 1984).

Relative attribute comparison seems to have the potential to explain the attraction effect in some cases, but there is no empirical evidence in Huber and Puto's (1983) paper showing the link between this type of decision strategy and the attraction effect.

3.3.3 Tradeoff Contrast

Simonson and Tversky (1992) offered another decision rule, known as tradeoff contrast, for explaining occurrence of the attraction effect. This strategy suggests that consumers prefer alternatives that are clearly better on attributes. To identify the best option, consumers are assumed to make pairwise comparisons of attribute values in a tradeoff manner.

Let's take an example to describe the tradeoff contrast strategy and see how it may cause the attraction effect. Consider the following decision situation, which is a

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representative choice set used by Simonson and Tversky:

Personal Computers

Situation 1	Price	Memory
Brand X	$1000	640K
Brand Y	$1175	760K
Brand Z	$1400	840K

Here, brands Y and Z constitute the core choice set, and brand X is a relatively inferior decoy. As positioned, Y is the target and Z is the competitor. Also, notice that Y is a middle option in the three-alternative set. According to tradeoff contrast hypothesis, consumers will calculate the advantages and disadvantages of one alternative in relation to the others, and then compare the merits of exchange. For the above choice task, consumers are assumed to involve computations as follows:

$$Y\text{-}X = (\$1175\text{-}\$1000)/(760K\text{-}640K) = \$1.46/K$$

$$Z\text{-}X = (\$1400\text{-}\$1000)/(840K\text{-}640K) = \$2.00/K$$

$$Z\text{-}Y = (\$1400\text{-}\$1175)/(840K\text{-}760K) = \$2.81/K$$

It is easy to see that among the three comparisons, the exchange rate between Y and X is the lowest. This suggests the selection of brand Y as the best buy. In this case, the addition of the decoy X to the core set (Y and Z) in effect provides consumers with other pairs of comparisons in which the merits of exchange is larger than that implied by the comparison between the two existing alternatives in the core set. That is why, in Simonson and Tversky's thinking, the attraction effect occurs when three alternatives are under consideration.

Similar to the relative attribute comparison heuristic, the tradeoff contrast rule has its theoretical foundation in transaction utility theory. Consumers are assumed to set up a mental account in terms of the merits of exchange between two alternatives, and the rate of exchange determines consumer preference and choice.

In a number of experiments, Simonson and Tversky (1992) demonstrated that when three alternatives are presented, the relatively superior alternative or the middle option is chosen more often than when it is paired with only one other alternative. The observed attraction phenomenon is explained by the authors on the basis of the tradeoff contrast hypothesis. However, it remains unclear whether the decision rule they claimed really underlied their findings. In addition, the tradeoff contrast strategy cannot explain all instances of the attraction effect.

3.3.4 Salience of Value Difference

Heath and Chatterjee (1991) investigated circumstances where the relative attribute comparison rule discussed earlier may hardly explain the observed attraction effect.

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Consider the choice materials used by Heath and Chatterjee:

	Beer	
	Price	Quality
Competitor	4.95	75
Target	4.25	65
Decoy	4.85	65

These three alternatives constitute the decision context in which the decoy is fully-dominated by the target and nearly-dominated by the competitor. Suppose the relative attribute comparison operates in this situation. The consumer anchors on the decoy, switching to the target s/he loses nothing in quality but saves 60 cents. Switching to the competitor, however, costs an additional 10 cents with a gain of 10 quality points such that each added quality point costs only 1 cent. Heath and Chatterjee argued that whether the target or the competitor looks more attractive here is not quite clear according to the rule of relative attribute comparison. They went on to suggest another decision rule called salience of value difference. This decision strategy suggests that consumers compute the value, defined as the ratio of one attribute over the other, for each of the available alternatives in the set, and then compare the value differences between the alternatives. The authors indicated that only the obvious differences can be recognized.

For the choice task described above, the values (quality/price) of the competitor,

target, and decoy are 15.15, 15.29, and 13.40, respectively. It seems the value difference between the target and the decoy is more obvious in this situation. Heath and Chatterjee claimed that it is the salient target-decoy value difference rather than the relative attribute comparison rule that makes the target look more appealing than the competitor when the decoy is added.

The authors experimentally examined the salience of value difference heuristic for explaining the attraction effect. The decision contexts they manipulated are given below:

| | Beer | |
	Price	Quality
Situation 1		
Brand A	4.25	65
Brand B	4.95	75
Brand X	4.95	72
Situation 2		
Brand A	4.25	65
Brand B	4.95	75
Brand Y	4.95	67
Situation 3		
Brand A	4.25	65
Brand B	4.95	75
Brand Z	4.95	65

Brands X, Y, and Z were the decoys in the three choice situations, respectively. As shown, these decoys varied in quality but their prices were manipulated to be the same as that of brand B's. Notice further that the strength of the decoys relative to brand B decreases from Situations 1 to 3. Particularly, decoy Z in Situation 3 is dominated by not only brand B but by brand A as well.

As expected, the attraction effect was observed when either X, Y, or Z was introduced to the core choice set (A and B). More importantly, Heath and Chatterjee also found that the choice share of brand B decreased as the added brands became weaker. In particular, subjects were indifferent between A and B, when Z was added. Heath and Chatterjee interpreted the results using the salience of value difference rule. It can be shown that the dominating alternative(s) in each of the three choice situations was the winner according to the decision rule they suggested. However, one may argue that the reported findings might result from subjects' systematic perceptual biases as the positioning of the decoys in Heath and Chatterjee's study was analogous to the frequency increasing manipulation discussed before.

3.4 Changes in Consideration Set Formation

Lehmann and Pan (1994) explored the attraction effect from the notion of consideration set formation. They argued that dominating and compromise brands tended to be included in consumers' consideration sets, and as a result, were more likely to be chosen. The hypothesized effects were assumed to be stronger in smaller markets than in

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larger markets.

In a within-subject experiment. subjects were first exposed to several product categories, each having a set of two existing brands in small markets and eight existing brands in large markets. All of the existing brands were positioned on the efficient frontier in a two attribute space. Then, subjects were provided with the same product categories and existing brands with a new brand added in each product class. Lehmann and Pan found that consumers significantly decreased their considerations of the brand when it became dominated or extreme after a new brand entry, but that there was no significant increase in consideration of the dominating or compromise brand after entry. The results provide partially support to Lehmann and Pan's arguments. As expected, the observed impact of new brand entry on consideration set formation was stronger in small markets (two-existing brands). This may suggest that a dominating or compromise relationship is more easily detectable in small markets than in large ones. Moreover, the choice pattern reported by Lehmann and Pan was similar to that of consideration set membership. Using a between-subject design. Lehmann and Pan further confirmed the within-subject results with choice tasks involving six existing brands and two or three attribute dimensions for each brand.

The overall results in Lehmann and Pan's paper show that an added brand has the potential to increase the likelihood of the dominating or compromise brand included in consumers' consideration sets. In the view of Lehmann and Pan, the attraction effect results from the impact of new brand entry on consideration sets.

3.5 Moderating Variables

In developing possible explanations for the attraction effect, some researchers have looked at variables that may moderate the observed effect. Several moderating variables have been proposed in the literature. The major ones are presented as follows.

3.5.1 Product Knowledge

As one of the frequently examined variables that influence decision making, product category knowledge has been proposed to moderate the attraction effect. Ratneshwar et al. (1987) and Mishra et al. (1993) hypothesized that the attraction effect is greater for those who are unfamiliar with the product category (vs. familiar).

The argument in both studies is that, compared to those with more product class knowledge (experts), consumers with less knowledge (novices) are not better equipped with the ability to process product information, and have more difficulty in making distinctions between alternatives in the choice set, and as a result, are more likely to show context effects in preference and choice. This argument emphasizes the greater reliance of novice consumers on context inferences of attribute values of a particular stimulus when making their decisions. An alternative view pertains to decision differences between experts and novices. Ratneshwar et al. reasoned that, while experts were able to process in a compensatory or tradeoff manner, novices tended to use simple and constructive strategies in their decision processes. For Ratneshwar et al., deliberate tradeoffs of attribute values cannot lead to the attraction effect as decisions made using a tradeoff

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procedure represent rational choices from a utility perspective. By contrast, simple heuristics are task-determined and therefore are expected to be affected by context effects (Ratneshwar et al. 1987). Indeed, as typically used by attraction effect researchers, choice tasks involve readily available contextual cues such as an asymmetric dominance relationship, which are likely to be used as basis for simplifying the consumer decision process (Simonson 1989). However, the reasoning of experts seems contradictory to some of the decision rules proposed by other researchers. For instance, the tradeoff contrast strategy discussed earlier implicitly assumes that a tradeoff process drives the attraction effect. In a recent paper, Wernerfelt (1995) suggested that the attraction effect may also reflect a consumer's rational construction of the decision problem.

The empirical results in both studies (Ratneshwar et al. 1987; Mishra et al. 1993) do not provide much support for the hypothesized influence of product class knowledge on the attraction effect. Of the three product classes examined (beer, TV sets and cars), the significant effect of product knowledge was only found for beer in Mishra et al.'s article. As expected, they found that an increase in product class knowledge decreases the magnitude of the attraction effect. The authors attributed the nonsignificant effect of knowledge on the observed attraction effect in the other two cases (TV sets and cars) to student subjects' general lack of knowledge about those two product classes. In Ratneshwar et al.'s paper, product knowledge or familiarity, though in the hypothesized direction, was found to not significantly moderate the attraction effect for all of four product classes examined (TV sets, orange juice, beer, cars). The researchers suspected that the results might be due to the inadequate operationalization of the product familiarity

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construct. The measure of product familiarity in their study was based on the measure developed by Park (1976). It stresses subjective assessment of familiarity with product characteristics. In fact, Mishra et al. employed a multiple-criteria assessment (Alba and Hutchinson 1987) to capture the richness of the product knowledge construct. Such improvement in measurement, however, did not produce stronger results.

The findings showed that the attraction effect did not vary with the levels of product class knowledge. Thus, one may conclude that the differences in decision processes between experts and novices make no significant difference in the so-called attraction phenomenon. While for experts the observed attraction effect may be explained in a comprehension process of attribute values, for novices the phenomenon is likely to be accounted for in a simplified decision process. In other words, experts and novices differ in the mechanisms producing the attraction effect.

3.5.2 Stimulus Meaningfulness

Stimulus meaningfulness is another construct that has been proposed to influence the attraction effect. A stimulus is considered meaningful if individuals are able to make a set of contrast with respect to the distinctions between stimulus objects on each attribute dimension (cf., Ratneshwar et al. 1987).

Ratneshwar et al. (1987) argued that in the numerical form of some attributes such as quality and taste, as they are often used in the attraction effect research, rests a lack of meaningfulness to individuals. For example, "What does it mean for a beer to have a quality rating of 70 rather than 50?" or "What does it mean for a TV set to have a

distortion level of 2.5 percent, as compared to 1.5 percent?" According to the authors, the nature of numerical attribute values causes considerable ambiguity in the answers to these questions, and thus, reduces consumers' ability in distinguishing between stimulus objects. However, if the elaboration of the ambiguous attribute information is provided, it will increase consumers' ability to differentiate among particular stimuli (Ratneshwar et al. 1987). The authors suggested that elaboration can be done by providing consumers with more descriptions of numerical attribute values. For instance, the description, "Quality rating of 70: Taste very clean and fresh," elaborates on the numerical description, "quality rating of 70."

Ratneshwar et al. expected that the attraction effect might be an outcome of the lack of meaningfulness of the attribute information. In particular, they hypothesized that the attraction effect would diminish as the attribute information is made more meaningful or relevant. A similar hypothesis is also seen in Mishra et al.'s paper (1993). As in the case of product category knowledge, the possible influence of information ambiguity on the attraction effect is expected to take place in two different ways. One way pertains to the inference of a particular stimulus meaning from other stimulus offerings in the decision context. The other refers to the use of simple choice heuristics instead of tradeoffs on attribute values (Ratneshwar et al. 1987). In the arguments made by Mishra et al., the emphasis is placed on the latter. They wrote, "if the information presented makes less sense to a person, it is more likely that such a person will resort to a decision-simplifying paradigm. On the other hand, if the presented information is perceived as relevant, it should facilitate the decision-making process, and the resulting decision structure should

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be a clean and stable one" (p. 333). As mentioned earlier, some decision rules proposed by other researchers (e.g., Simonson and Tversky 1992) in fact reflect a comprehension process on attribute values in producing the observed attraction effect.

Ratneshwar et al. (1987) experimentally manipulated subjects in two conditions. Half of the subjects in the experimental condition were given elaborations of the attribute values, while the other half in the control condition were given only numerical values. Except for the case of beer, the results in their paper provide support for the hypothesized moderating influence of information meaningfulness on the attraction effect. Further evidence is also obtained by Mishra et al. (1993) using similar experimental procedures as in Ratneshwar et al.'s study. They showed that the attraction effect decreased as information meaningfulness increased for each of three product categories including beer.

Stewart (1989) asserted that the failure to eliminate or decrease the attraction effect for the elaborated version of beer in Ratneshwar et al.'s article might have been due to inadequate verbal descriptions of attributes with sensory experiences like taste. In his view, the attraction effect could have only been eliminated by providing consumers with actual sensory experiences. In an experiment, Stewart manipulated the elaboration condition by allowing subjects to taste the available brands of beer in a given set. As expected, the attraction effect was significantly diminished in the elaborated condition. Stewart further confirmed his findings using another product stimuli (chocolate candy).

However, it might be argued that, by providing direct sensory experiences, subjects might be induced to concentrate on the sensory attribute (e.g., taste). As a result, respondents perhaps payed less attention to the other attribute dimension (e.g., price). If

correct, the alternative with the lowest quality in the set would be easily eliminated. As demonstrated in Stewart's study, the newly added brand in each case (beer and chocolate candy) was relatively inferior, and thus, likely to be deleted from the choice set. Because of this, subjects who were offered actual sensory experiences may have lost ground with respect to exhibiting the attraction effect. In fact, Stewart reported some evidence showing that the sensory attribute was heavily weighted by the subjects.

While the above studies provide evidence showing the moderating role of information meaningfulness in the attraction effect, there are also empirical results suggesting that the attraction effect is not affected by stimulus meaningfulness. As reviewed before, Simonson and Tversky (1992) demonstrated the attraction effect in a number of experiments even for product stimuli that are relatively realistic and highly meaningful in attribute descriptions. In Simonson's (1989) experiments, the attraction effect was also observed even though subjects were given the attribute-level ranges of market offerings. In a more recent study, Pan, O'Curry, and Pitts (1995) further obtained the attraction effect using real political candidates as stimuli. Evidently, the impact of information ambiguity on the attraction effect is mixed. However, one may conclude that stimulus meaningfulness is not sufficient to capture the rich attraction phenomenon.

3.5.3 Accountability

Accountability - pressure to justify one's subjective judgments or decisions to others - has widely been recognized as a crucial factor that influences consumer information processing (Tetlock 1983a). Researchers have identified a variety of motives

for people to justify their decisions, including the desire to enhance one's self-esteem, anticipation of the possibility of regret or cognitive dissonance, the need to increase people's perceptions of themselves as rational beings, the desire to show competence, impression management, social exchange, conformity, as well as ingratiation (see, Simonson 1989).

There are many situations in which consumers may feel accountable to others Schellinck (1980), for example, described three such situations:

1. Other parties are expected to evaluate the brand choice. (e.g., purchasing agents buying for client departments will have to explain their choices).

2. There is group consumption of the product. (e.g., a mother buying toothpaste for her family might be expected to explain her choice of brand).

3. There is visible consumption of the product. (e.g., a man purchasing a new set of clubs may anticipate explaining his choice to his associates at the golf club).

Accountability determines the amount of effort expended during the decision processes. As accountability increases, the consumer will be motivated or forced to consider a wide range of information in order to avoid making any judgmental or decision bias (Tetlock and Kim 1987; Kruglanski and Freund 1982; Hagafors and Brehmer 1983).

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However, under certain circumstances the more complex modes of information processing may also increase judgmental errors or decision biases (Tetlock and Boettger 1989).

In the decision contexts of the attraction effect, Simonson (1989) presented appealing evidence showing that accountability or the need for justification can lead to greater distortions in choice. The major argument offered by the researcher is the notion that consumers seek reasons to prefer one alternative over another, particularly when they expect to justify their decisions to others. There are many potential reasons which can be used as bases in the consumer decision making. For a specific decision problem, however, certain reason(s) may become salient or diagnostic, and thus more likely to be used by consumers.

From the perspective of choice based on reasons, Simonson attempted to explore the causes of the previously observed attraction effect. He argued that, in the decision contexts of the attraction effect, an asymmetric dominance or compromise relationship is the "best" reason for consumers to justify their decisions, especially when they have uncertainty about the preferences of others. In Simonson's view, the introduction of an asymmetrically dominated or relatively inferior alterative causes the attraction effect by augmenting the dominance or near-dominance reason for choosing the dominating alternative. However, in the case of the attraction effect due to compromise relationship, the introduction of an extreme alternative makes the middle option become attractive as it appears as a better tradeoff solution.

Simonson experimentally examined his expectations by manipulating the levels of subjects' need for justification (i.e., accountability). He hypothesized that the attraction

effect is stronger for people in the high justification condition than for those in the low justification condition. Consistent with the hypothesis, Simonson found that the attraction effect increased when student subjects were told that their decisions would be evaluated in class and that they might be asked to justify their decisions.

To gather insight into the reasons for the occurrence of the attraction effect, Simonson also conducted a small experiment where think-aloud protocols were collected from 23 student subjects. The subjects were given only the three-alternative choice sets with an asymmetric dominance or compromise relationship. The protocol results showed that the selection of the dominating or compromise alternatives was associated with more elaborations of available alternatives. This seems to suggest the adoption by subjects of a comprehension process in which they search to differentiate options from each other in a choice set (Tversky and Simonson 1993). Since Simonson did not measure the attraction effect at the individual level, the obtained cognitive thoughts may only provide a general pattern of the decision processes in the contexts of the attraction effect. Besides, there was no protocol analysis reported in Simonson's paper regarding the differences in decision processes between subjects in high and low justification conditions. The lack of an individual level analysis on the decision processes makes the explanation for the attraction effect less conclusive. Therefore, further studies employing process tracing methods are clearly needed to verify Simonson's arguments.

3.5.4 Other Influencing Variables

Using structural equation analysis, Mishra et al. (1993) modeled the impacts of a number of variables on the attraction effect in the decision context with an asymmetric dominance relationship. The variables examined by these researchers include, in addition to product class knowledge and stimulus meaningfulness discussed earlier, task involvement, decoy similarity, decoy popularity, and preference strength.

They found, respectively, that the attraction effect decreased as consumers were more involved with the decision task and had strong preference for a brand in the choice set. They also showed that the attraction phenomenon increased with an increased level of the perceived decoy-target similarity and decoy popularity. These findings enrich our understanding regarding the possible effects of some task and contextual variables on the attraction phenomenon. However, it is not clear how those variables operate in producing the results reported in Mishra et al.'s article.

4 Summary

There is ample empirical evidence supporting the attraction phenomenon. This phenomenon reflects context effects on choice, which deviates from choice pattern predicted by the standard model of value maximization. The findings reported in this area suggest that this deviation involves situations where the choice between two alternatives depends on the presence of a third, asymmetrically dominated, relatively inferior, or an extreme, alternative. In an attempt to uncover the newly observed choice anomaly, researchers have proposed a number of explanations. In general, the speculated reasons

focus on the possible impacts of a new brand entry on perceptual biases and the use of decision rules or strategies. In addition, there are also studies which have looked at the role played by product class knowledge, stimulus meaningfulness, the need for justification, and the like, in the demonstrated attraction effect. Nevertheless, it is still not fully understood as to the processes that lead to the attraction phenomenon. Note that, very rarely, prior researchers have actually collected and analyzed individual-level, protocol data.

Appendix I is a summary of the major empirical studies on the attraction phenomenon. This overview focuses on the following aspects: decision contexts (dominance, near-dominance, or compromise relationship), research methodology (subjects, stimuli, design), as well as theoretical explanations (perceptual biases, the use of decision rules, or moderating variables).

Chapter 3:

Theoretical Foundations and Research Hypotheses

The attraction effect reflects the influence of decision context on brand preferences. It has been viewed as a phenomenon of imperfect choice or a choice anomaly (Huber et al. 1982; Mishra et al. 1993). Current research on the attraction effect has shifted towards the causes of the observed phenomenon (Simonson and Tversky 1993; Wernerfelt 1995).

Given the various explanations for the attraction effect, researchers (Ratneshwar et al. 1987; Simonson 1989; Lehmann and Pan 1994) suggest that process tracing methods such as concurrent or retrospective protocol analysis are potentially useful tools which may be utilized in order to gain direct insight into the reasons for the findings reported in the area. Particularly, the relative simplicity of the choice tasks used for the attraction effect studies may lend itself well to the production of manageable data on decision processes. Hence, less difficulties would be attached to the use of process tracing methods.

Research on consumer decision making has been both widespread and informative. Recent development in this area has focused on adaptive decision behaviour (Payne, Bettman, and Johnson 1988; 1992). Similarly considerable interest has been directed towards reason-based choice (Montgomery 1983; 1989; Simonson 1989). In both streams

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of research, the impact of decision context has been an important issue. The present study attempts to use these research streams as theoretical bases to provide direct insights into the mechanisms underlying the attraction effect by examining protocol data.

1 Adaptive Decision Making

Numerous empirical findings of recent decision research support the notion that a decision process is governed by a number of decision rules or strategies (Abelson and Levi 1985). Decision strategies are adaptive to a particular choice task (Payne 1982) Adaptation may occur in two contrasting modes: top-down process and bottom-up process (Payne, Bettman, and Johnson 1992). The cost/benefit framework for strategy selection implicitly assumes a top-down adaptation, whereas the constructive view of decision making reflects a bottom-up adaptation.

A Top-Down Adaptation. Many researchers advocate that the selection of a particular strategy is a function of cost-benefit analysis of using the various decision rules (Beach and Mitchell 1978; Payne, Bettman, and Johnson 1988; 1992). Costs are primarily seen as effort required to use a decision rule while benefits are primarily portrayed as the ability of a strategy in selecting the best alternative or the "accurate" choice (Payne et al. 1992). The implicit viewpoint in the cost-benefit framework is that a decision maker assesses the required cognitive effort and accuracy of various strategies for a given choice task. Then, s/he selects the strategy that is expected to achieve his/her goals. This top-down view of strategy selection suggests that a decision maker is adaptive to task demands at the start of a decisional episode by selecting a relatively efficient strategy and then using this strategy until a choice is made. In this case, successful adaptation requires the decision

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maker's knowledge about the relationships among choice context, strategies, and decision outcomes (Klein and Yadav 1989).

A Bottom-Up Adaptation. Payne et al. (1988; 1992) go one step further in the top-down process of strategy selection. They suggest that decision strategies may develop during the course of solving a choice problem in a more bottom-up and constructive fashion. Bottom-up adaptation is that throughout a decisional episode an individual can subsequently replace an original strategy by another decision rule as a result of adapting to task demands. The general underlying assumption is that decision makers can learn about the problem structure during the course of making a decision and may change their strategies as the structure changes. Consistent with the bottom-up view of adaptation, Klein and Yadav (1989) noted that decision makers may rely on relatively simple forms of feedback about the choice context as they go through the choice process, rather than systematically assessing it prior to strategy selection.

In fact, there is much evidence showing the adaptive use of heuristics in a more bottom-up fashion (Payne et al. 1988; 1992; Klein and Yadav 1989). General support for such adaptive behaviour lies in the fact that decision makers tend to use multiple strategies in arriving at a final choice (Payne 1976; Lussier and Olshavsky 1979; Gertzen 1992). The use of hybrid strategies or phased heuristics in decision making implies that people adapt on-line during the decision-making process. Specifically, individuals adapt to changing environments and use combinations of different strategies, often constructing a strategy as they proceed (Bettman and Zins 1977). Of particular importance is the finding that an elimination strategy, such as elimination by aspects, is often used to reduce the choice set

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to a manageable size and the remaining alternatives then are processed in a more compensatory manner (Johnson and Puto 1987).

The choice set typically used in the past attraction effect studies has been relatively simple, consisting of two or three alternatives and two attribute dimensions per alternative. According to the view of adaptive decision behaviour, consumers in such a simple decision situation are more likely to use attribute-based strategies, taking into account comparative characteristics of the alternatives when making a final decision. This process may account for the occurrence of the attraction phenomenon.

Recently, Wernerfelt (1995) suggested that the attraction phenomenon can be seen as an outcome of consumers' rational inferences about utilities from market offerings. In fact, some of the previously proposed theoretical explanations for the attraction effect, such as the consumer's reliance on relative attribute comparison (Huber and Puto 1983) and the tradeoff contrast (Simonson and Tversky 1992), also imply the role of attribute comprehension and inferences in producing the attraction phenomenon. Consequently, we put forward the following hypothesis:

Hypothesis 1:

The attraction effect results from consumers' evaluations, comparisons, or any other computations on attribute values - namely, the attribute-based process.

2 The Search for Reasons in Decision Making

A number of researchers have proposed a view that under certain situations, decision makers tend to make their choices on the basis of available reasons and justifications (Simonson 1989). An example of the reason-based choice can be seen in Slovic's (1975) paper. He reported that when faced with a choice between two equally valued alternatives, decision makers tend to prefer the one that is better on the more important attribute. According to the author, such an approach to problem solving is likely to occur because the chosen option can be easily justified to oneself and others as being the best decision.

The current theorizing on reason-based decision making has advanced the idea that the decision process involves the search for a dominance structure - a cognitive representation in which one alternative can be perceived as dominant over the others (Montgomery 1983; 1989). The search for a dominance structure in decision making is an appealing process because it provides a ground for justifying the final choice (Montgomery 1983). It permits decision making be based on clear reasons without reliance on relative weights, attribute tradeoffs, or other effortful computations, thus easing the demands on the decision maker's limited information processing capacity. In this sense, the desire to search for a dominance structure is compatible with the characterization of consumers as limited information processor (Montgomery 1989). As Montgomery further argues, decision makers have the tendency to protect their choices from the competing alternatives, thus the construction of a dominance structure is a desirable goal for decision makers.

In the context of brand decisions, the dominance-search model suggests that brand

preference and choice is a function of the dominance structure in the choice set. In most cases, however, a dominance structure may not exist in a pure sense. Therefore, the decision maker needs to restructure the given information in such a way that a dominance structure is obtained. Montgomery (1989) proposed a number of operations that can be used to achieve this. For example, the decision maker may **de-emphasize** a given disadvantage of the promising alternative and/or **bolster** the disadvantages of non-promising alternatives. According to Montgomery, these operations may result in a fully developed dominance structure in which the preferred alternative appears better than the other alternatives on all of the attributes under consideration, or the disadvantages of the preferred choice are completely eliminated, neutralized or counterbalanced. Another possibility of dominance structuring is that the decision maker can only arrive at a less developed dominance representation in which the disadvantages of the preferred alternative are considered as small or negligible, or the decision maker simply restricts his/her attention to combinations of attributes (Montgomery 1989).

Unfortunately, little empirical evidence has been reported thus far to support the depiction of decision making as a search for dominance. In studying the effect of the dominance relationship on adaptive decision making, Klein and Yadav (1989) have recently showed that increasing the number of dominated alternatives significantly improved choice accuracy and reduced choice effort. These findings clearly indicate that decision bahavior is affected by the dominance structure encountered (or constructed) in the decision process.

In addition to the dominance structure, Simonson (1989) indicated that decision

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behaviour may also be accounted for by the compromise structure - a cognitive representation in which one alternative is seen as a compromise choice (or a middle option) in terms of its attribute values between the existing alternatives. Drawing from the notion of loss aversion (Tversky and Kahneman 1991), Simonson and Tversky (1992) argued that decision makers tend to avoid the selection of extreme alternatives. The construction of a compromise structure is likely to make decision makers feel safe or less risky about their decisions (Huber and Puto 1983; Simonson 1989). It implies that the compromise representation found among decision alternatives may serve as another good basis for justifying a choice. As in the case of searching for a dominance structure, this decision process similarly involves less considerations of attribute values.

In short, decision making has been described as a process of searching for contextual factors that may provide reasons or justifications for the final choice. Two of these factors are the dominance and compromise relationships among the alternatives in the choice set. The view of reason-based decision making implies that little information comprehension is required for making a decision. Rather, the main decision task is to establish a dominance and/or a compromise relationship among the alternatives, which in turn can lead to the final choice.

The perspective of reason-based decision making provides an alternative explanation for the occurrence of the attraction effect. As mentioned earlier, decision contexts used in the past studies of the attraction effect incorporated dominance (or near dominance) and/or compromise relationships. According to the reason-based theory of decision making, these characteristics of the decision context are likely to be used as bases

for justification when consumers make their decisions. Therefore, we postulate our second hypothesis as follows:

Hypothesis 2:

The attraction effect results from consumers' reliance on a dominance and/or a compromise relationship contained in the choice task - namely, the reason-based process.

It should be noted that Simonson (1989) attempted to examine the reason-based process in explaining the attraction effect. In one of his experiments, Simonson collected think aloud protocols from subjects. However, because the attraction effect was measured only at the aggregate level, the obtained cognitive thoughts could not be used to explain the individual subject's decision process leading to the attraction effect. This lack of an individual level analysis of the decision process renders the author's explanation for the attraction effect less conclusive.

3 The Dual Process Model of the Attraction Effect

Hypotheses 1 and 2 implicitly assume two alternative decision processes leading to the attraction effect. Noting that decision behaviour is likely to consist of multiple systems that interact in various ways (Payne 1982), we expect that the two-way processes explaining the occurrence of the attraction effect are more complementary than competitive.

Evidently, most of the prior attraction effect studies have used brand preference and choice as dependent variables. As such, the obtained attraction effect may suggest a direct relationship between an attribute-based process and the attraction effect, and/or between a reason-based process and the attraction effect. The direct impacts of the two-way decision processes on the attraction effect are stated in Hypotheses 1 and 2. Alternatively, we cannot rule out the possibility that the attraction effect is derived from changes in overall brand evaluations, and that the latter is influenced by the dual processes. Specifically, we postulate that attribute- and reason-based processes may cause the target brand being evaluated more positively relative to the competitor after the addition of a decoy, and the relative evaluation of the target in turn produces the attraction effect. Here, an indirect relationship between the two-way decision processes and the attraction effect is hypothesized, with relative evaluation of the target as an intervening variable. The indirect impact of the dual processes on the attraction effect is outlined in the hypotheses given below.

Hypothesis 3:

The impact of attribute-based process on the attraction effect is mediated by relative evaluation of the target brand.

Hypothesis 4:

The impact of reason-based process on the attraction effect is mediated by relative evaluation of the target brand.

The combination of Hypotheses 1-4 can be represented by the model depicted in

Figure 4. This conceptual model identifies an attribute-based process and a reason-based

process as two key influences (directly and indirectly) on the attraction effect

Figure 4
The Dual Process Model of the Attraction Effect
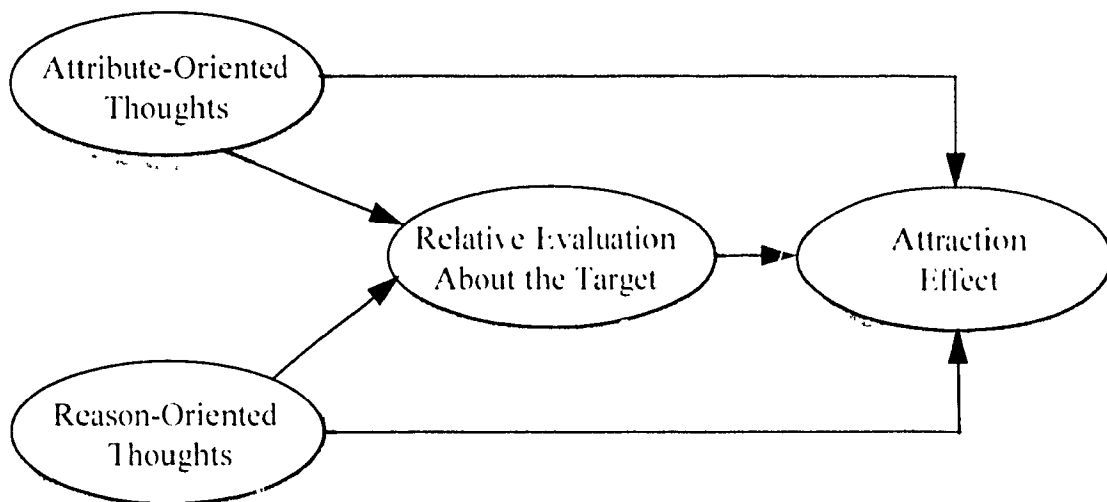
4 The Effects of Accountability and Information Ambiguity on Attraction Processes

Our second research issue concerns the effects of accountability and information ambiguity on the two-way decision processes of the attraction effect. Evidently, prior researchers have shown significant influences of accountability and information ambiguity on the attraction effect.(Simonson 1989; Ratneshwar et al. 1987; Mishra et al. 1993). However, relatively little is known as to the underlying mechanisms. As a further step, we postulate a number of hypotheses regarding possible impacts of the two variables on the dual processes underlying the attraction effect.

4.1 The Effect of Accountability

A large body of research evidence indicates that accountability tends to induce people to make more analytic, systematic, thorough, and vigilant information processing (Tetlock 1985). For example, Tetlock (1983a) showed that accountability to someone with unknown opinions motivated subjects to express more complex thoughts on controversial policy issues, and to pay particular attention to inconsistent information. Hagafors and Brehmer (1983) indicated that accountability is able to change the nature of judgment process. In fact, they found that having to justify one's judgement led to a more analytical and comprehensive use of information. Similarly, Kruglanski and Freund (1983) reported that accountability generated more cognitive modes of thoughts.

Tetlock and Boettger (1989) noted that under some circumstances, encouraging people to take more information into account may result in decision biases. They explained

that accountability motivates people to use a wide range of information in making decisions. However, it did not induce people to discriminate between diagnostic information and that of a nondiagnostic variety. This suggests that the complexity of thinking does not necessarily lead to better decisions. In fact, Simonson (1989) observed that accountable subjects involve more biases in brand decisions compared to unaccountable subjects. We expect that Simonson's findings might be due to differing degrees in the use of the information relevant to the decision tasks between accountable and unaccountable subjects. Specifically, consumers who expect to defend their choices may have a greater motivation to attend to and comprehend all the information available in the choice task. These consumers should allocate greater cognitive effort to their attribute review process. They should also pay more attention to the readily available reason-specific information such as a dominance relationship as opposed to consumers who do not expect to justify their choices.

Hypothesis 5:

The use of an attribute-based process increases with increased levels of accountability.

Hypothesis 6:

The use of a reason-based process increases with increased levels of accountability.

4.2 The Effect of Information Ambiguity

Ambiguity of attribute information may arise from a consumer's lack of knowledge or experience with the product category. On the other hand, the descriptors of stimulus objects may be fuzzy or less meaningful (Mishra et al. 1993). Consumers' ability to process in terms of depth and comprehension is limited by the lack of meaningfulness in attribute descriptions. As such, they may find it difficult to assimilate information into their decision-making process.

The level of difficulty of a problem is a major determinant of problem-solving behaviour (Kotovsky and Simon 1990). Consumers with ambiguous attribute descriptions are likely to rely more on certain diagonistic cues such as a dominance relationship rather than the elaboration of attribute values. This suggests that the use of reason-based process will increase when attribute information is ambiguous or less meaningful. On the other hand, consumers tend to increase their use of attribute-based process as attribute information is made less ambiguous or meaningful. Formally, we expect that information ambiguity is likely to force individuals to pay more attention to the readily available dominance and/or compromise relationship when making their decisions. This saves them a thorough processing of ambiguous attribute information. This is, in turn, consistent with a perspective based on cost of thinking (Shugan 1980). By contrast, if the stimulus materials are made more meaningful, this should facilitate the attribute review process. Therefore, we postulate that information ambiguity is negatively related to an attribute-based process and positively related to a reason-based process.

Hypothesis 7:

The use of an attribute-based process increases with decreased levels of information ambiguity.

Hypothesis 8:

The use of a reason-based process increases with increased levels of information ambiguity.

To incorporate Hypotheses 5-8 into the dual process model of the attraction effect (Figure 4), we developed a more complete framework which is shown in Figure 5. This framework suggests the mediating role of the two-way decision processes in the occurrence of the attraction effect.

Figure 5
The Full Model of the Attraction Effect

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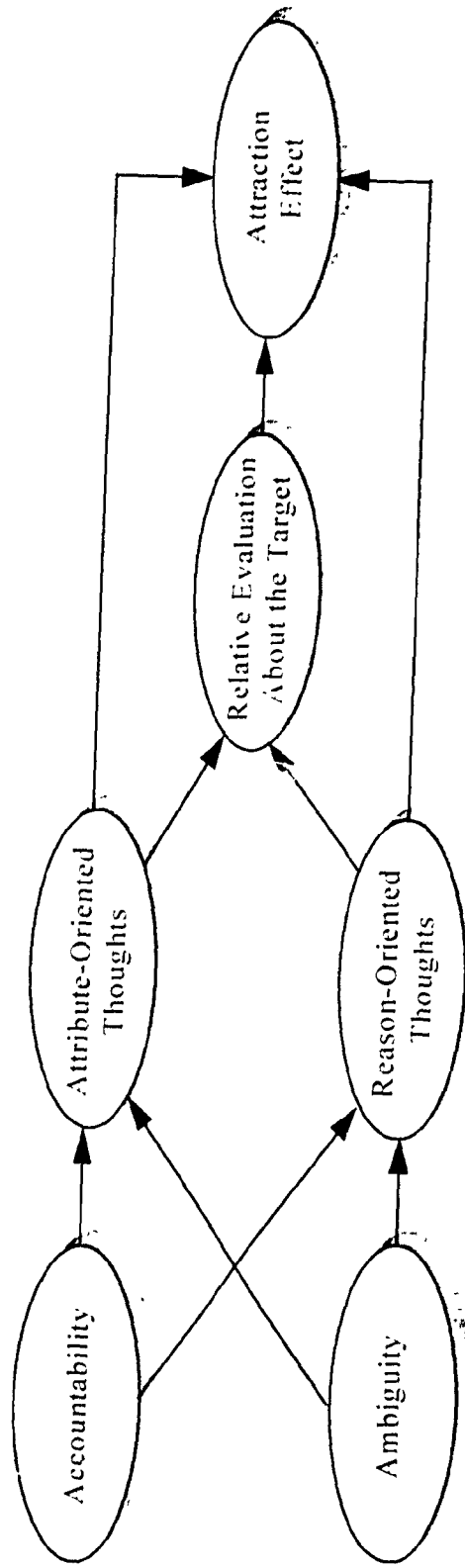
4.3 The Effects of Accountability by Information Ambiguity

As hypothesized earlier, both the use of attribute-based and reason-based processes increase with increased levels of accountability. However, the presence of ambiguous objects can increase the cost of thinking (Shugan 1980), or decrease the perceived diagnosticity of the relevant information (Dick, Chakravarti, and Biehal 1990), and as a result, reduce the comprehension process of attribute values for the high accountable consumers. Instead, these people should seek solutions by relying more on particular characteristics of the decision task, and thus, increase the extent of their use of a reason-based process. Conversely, if the information presented makes more sense to the consumers who are in the high accountable condition, it is more likely that such people will increase elaborations on attribute values, and decrease their reliance on the available choice set structures such as dominance relationship. For consumers who are in the low accountable condition, however, the extent of their reliance on an attribute-based process and a reason-based process are less likely to be influenced by the low or high information ambiguity. This is partly because low accountable consumers lack motivation to attend the comprehension process, and therefore, pay little attention to the diagnosticity of stimulus materials. These discussions lead us to put forward the following two hypotheses:

Hypothesis 9:

Accountability has a greater impact on the attribute-based process when information ambiguity is low (versus high).

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Hypothesis 10:

Accountability has a greater impact on the reason-based process when information ambiguity is high (versus low).

We further predict that, because increasing consumers' accountability leads to a greater use of an attribute-based process in the low ambiguity condition than in the high ambiguity condition, it will cause the attribute-based process to have a greater impact on the attraction effect, or alternatively, on relative evaluation about the target brand, when the presented information is made more meaningful (versus less meaningful).

Hypothesis 11:

With increased levels of accountability, the strength of the impact of the attribute-based process on the attraction effect is a decreasing function of information ambiguity.

Hypothesis 12:

With increased levels of accountability, the strength of the impact of the attribute-based process on relative evaluation of the target brand is a decreasing function of information ambiguity.

Similarly, we propose that the greater use of a reason-based process with increased levels of accountability in the high ambiguity condition (versus low ambiguity condition) will cause a greater impact of reason-based process on the attraction effect, or on relative brand evaluation toward the target.

Hypothesis 13:

With increased levels of accountability, the strength of the impact of the reason-based process on the attraction effect is an increasing function of information ambiguity.

Hypothesis 14:

With increased levels of accountability, the strength of the impact of the reason-based process on relative evaluation about the target brand is an increasing function of information ambiguity.

Noting that, accountability increases the impact of the attribute-based process on relative brand evaluation in the low level of information ambiguity (Hypothesis 12), while in the high level of ambiguity, accountability increases the impact of the reason-based process on relative brand evaluation (Hypothesis 14). As a result, increasing consumers' accountability may produce no significant differences in relative brand evaluation between the low and high levels of information ambiguity. Accordingly, it seems reasonable to hypothesize that:

Hypothesis 15:

With increased levels of accountability, the strength of the impact of relative evaluation of the target brand on the attraction effect does not vary with the low or high level of information ambiguity.

5 Summary

On the theoretical bases of adaptive decision making (Payne et al. 1988; 1992) and search for reasons in choice (Montgomery 1989; Simonson 1989), we identify two basic decision processes leading to the observed attraction effect: an attribute-based process and a reason-based process. The attribute-based process refers to consumers' comparisons, evaluations, and/or other effortful computations on attribute values. The reason-based process refers to the consumers' reliance on dominance and/or compromise relationships contained in the choice task. These two-way decision processes can occur either independently or simultaneously. And this, depending on other individual and task factors.

It is implicitly hypothesized that the dual decision processes cause the attraction effect directly and/or indirectly through their impacts on relative evaluations of the target brand. Furthermore, the impacts of accountability and information ambiguity on the two foundamental processes leading to the attraction effect were investigated above. Finally, we described how varying levels of consumers' accountability and information ambiguity should affect the decision processes and outcomes.

Chapter 4:

An Experimental Study - Research Methodology and Procedures

The issues to be researched are (1) the impact of the attribute-based process and the reason-based process on the attraction effect, as conceptualized in Figure 4; and (2) the impact of accountability and information ambiguity on the two-way processes for the occurrence of the attraction effect, which is depicted in Figure 5. Specific hypotheses were developed in Chapter 3.

Since the primary objective of this study is the investigation of decision processes leading to the attraction effect rather than the generalization of previously observed findings, an experimental setting was chosen so as to maximize internal validity.

Prior to the main experiment, a pilot study was conducted to ensure the variation of manipulated independent variables, observed dependent variables, as well as procedures used. The details of the main study are reported below.

1 Method

1.1 Subjects and Stimuli

Subjects for the study were graduate and undergraduate students at a major Canadian university. Most of previous studies on the attraction effect have also used student samples (e.g., Simonson 1989; Mishra et al. 1993). Two hundred students were recruited on the campus and paid for their participation. Subjects' ages ranged from 19 to 40, with a mean age of 24 years. The sample comprised 54 percent of males.

Two product categories were used: cars and stereo speakers. They were selected as product stimuli, in part, for their different risk and consumer involvement levels, and also for their relevance to the subject population (Mishra et al. 1993). In particular, earlier studies have reported varying degrees of the attraction effect using the two product categories (Lehmann and Pan 1994). As such, an understanding of the role of decision processes in the occurrence of the attraction effect for the two product classes will potentially be useful for a robust test of our research hypotheses.

1.2 Choice Sets

Exhibit 1 presents the choice sets used in this study. As commonly employed in earlier studies (e.g., Huber et al. 1982; Simonson 1989), each alternative was described on two attributes. Subjects were told to assume that the alternatives were similar on all other attributes. The attributes and their associated levels selected for each product were similar to those used in previous studies: city mileage per gallon and ride quality for cars, and sound quality and price for stereo speakers (Ratneshwar et al. 1987; Lehmann and Pan 1994).

Exhibit 1
Choice Sets Used in the Study

Cars

	Brand A	Brand B	Brand C
City mileage per gallon	19	32	30
Ride quality rating	80	60	40

Detailed description of the ride quality ratings

40   The car's suspension soaked up ordinary bumps and eased road hardness Some occupants, however, were bothered by the car's tendency to rock a little sharply from side to side Rough roads caused more noticeable, harsher motions The suspension topped out over the biggest bumps.

60:      The car's firm suspension gave a steady controlled ride on even rough roads With a full load in the car, the ride was occasionally uncomfortable for the rear passengers, but on the whole, the ride quality was good.

80:      The ride was majestic. The suspension with its electronically controlled automatic leveling, gave a smooth, gentle ride on almost all kinds of roads Only the very largest bumps caused some discomfort to the passengers.

Stereo Speakers

	Brand A	Brand B	Brand C
Sound quality	80	70	60
Price/pair	$229	$179	$169

Detailed description of the sound quality ratings

60:      Sound has somewhat distortion from perfection, but most listeners will not find it serious enough to be objectionable

70:      Sound has slight distortion, but few people can detect it

80:      Sound has virtually no distortion

In keeping with earlier practice, for each product category, subjects were presented

with two choice sets: a core set of two non-dominating alternatives (A and B) and a three-

alternative set in which a new entrant (C) was added to the core set. The new brand was

manipulated in the way that it was relatively inferior to brand B. Thus, B is the target

brand and A is the competitor. Figure 6 is a graphic representation of the three-alternative

choice sets used.

Figure 6
A Graphic Illustration of the Choice Set Structure
Manipulated in the Study
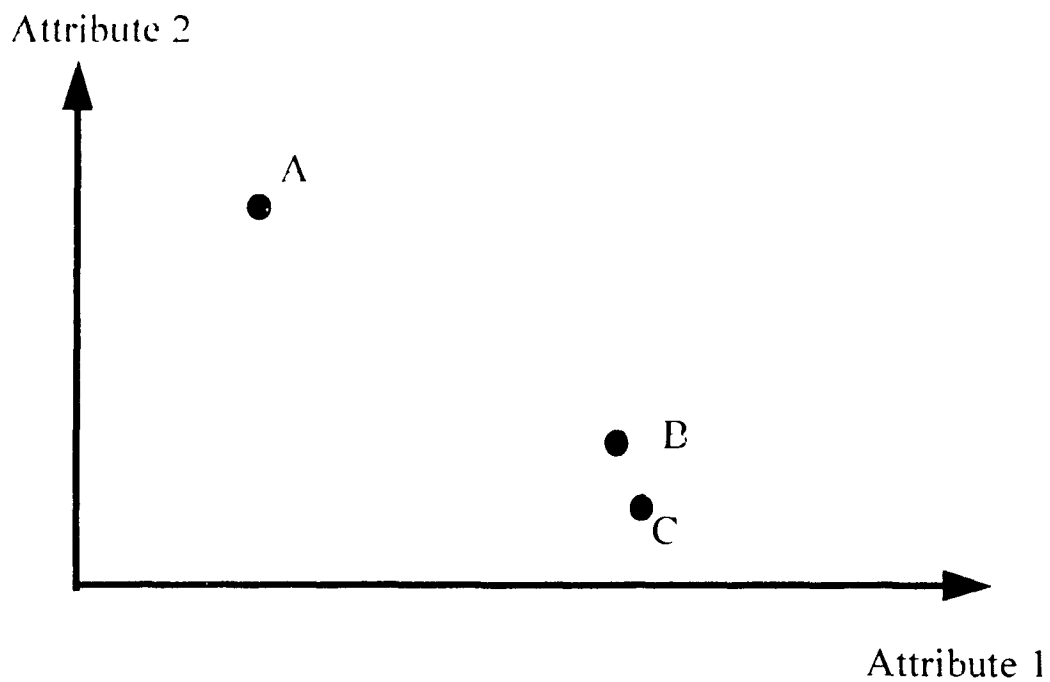
Brand A = Competitor; Brand B = Target; Core set = Brands A and B;
Set with relatively inferior alternative = Brands A, B, and C.

Structurally, the addition of brand C objectively establishes not only a dominance (or near-dominance) relationship but also a compromise relationship as well for the choice tasks. These characteristics of the choice set would enable us to fully test the two-way decision processes of the attraction effect.

1.3 Study Design

Accountability and information ambiguity were manipulated independently. There were two levels of accountability (low and high) and two levels of information ambiguity (low and high). This produced four treatment conditions corresponding to a 2 x 2 (accountability by information ambiguity) factorial design.

Testing the impacts of the two-way decision processes on the attraction effect does not require manipulations of accountability and information ambiguity. Therefore, the four experimental conditions were pooled together in the data analysis. However, for testing the impacts of accountability and information ambiguity, we performed a separate analysis for each design condition.

For each experimental cell, the study was conducted on a within-subject basis to compare the preference pattern in the core set consisting of two non-dominating brands A and B to that in the three-alternative set including the original two brands (labelled as X and Y, respectively, to reduce the demand effects) and a new brand. As a result, this study is a mixed design The between-subject aspect of the design assigns respondents to one of the four experimental conditions. By contrast, the within-subject aspect of the design requires the two choice tasks (before- and after-entry) for each product class to be

completed by each subject. Consequently, we can estimate the attraction effect for each respondent. As we have stated earlier, individual-level estimates of the attraction effect are essential to the understanding of the underlying decision processes.

2 Manipulation of Independent Variables

2.1 Accountability

The manipulation of accountability in this study is similar to that used by Simonson (1989). Subjects in the high accountability condition were told: "The purpose of this research is to investigate consumer brand preferences. Suppose you were shopping for yourselves and had to make brand choice decisions in each of the following two product categories - cars and stereo speakers. *Please note that we are interested in how well you make your decisions. Therefore, your choices will be evaluated individually, and you might be asked to justify your decisions. Print your name on the first page of the questionnaire.*"

Subjects in the low accountability condition, on the other hand, were told: "This research deals with consumer brand preferences. Suppose you were shopping for yourselves and had to make brand choice decisions in each of the following two product categories - cars and stereo speakers. *Please note that there is no right or wrong decisions. Your choices will remain totally confidential. Since the purpose of this study is not to assess the correctness of your decisions, you don't have to put your name on the questionnaire.*"

The creation of the high accountability condition was unsuccessful in the pilot study. We realized that it was not realistic to induce subjects to believe that their choices

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would be evaluated, because the experiment was conducted in other instructors' classes which were irrelevant to the domain of the study. As a result, in the main study, we decided not to use students in regular classes. Instead, we recruited subjects individually within the campus.

2.2 Information Ambiguity

Following Ratneshwar et al. (1987), we manipulated the ambiguity of attribute information using two stimulus descriptions: original and elaborated. In the original condition, subjects were only given the attribute values without any descriptions of those numbers. In the elaborated condition, however, subjects were presented with, in addition to attribute values, attribute elaborations, as shown in Exhibit 1. The attribute elaborations for cars were adopted from Ratneshwar et al. (1987), while for stereo speakers they were developed on the basis of Consumer Reports.

3 Procedure

Subjects were randomly assigned to one of the four design conditions. They were first instructed to read the covered story related to the manipulation of accountability. Then, they were presented with the core choice set (A and B of Exhibit 1), and asked to choose the brand they would buy, and to provide preference ratings and brand evaluations. Next, they repeated this set of tasks for the other product category. After taking a ten minute break, they were given the three-alternative set consisting of the two original brands and a new brand in each product category. Once again, subjects were instructed to

go through the descriptions about the accountability manipulation. Then, they responded to similar questions to that in the core choice tasks. In addition, they were required to complete a number of questions relating to manipulation checks of accountability and information ambiguity. They were also asked to complete questions regarding confidence in brand evaluations and choices, product familiarity, and attribute importance ratings. Finally, they were presented with a set of demographic questions.

To provide direct evidence on the decision processes of the attraction effect, retrospective verbal protocols (Ericsson and Simon 1984) were collected from the respondents. Subjects were asked to describe how they arrived at the decision immediately after each choice task involving the three-alternatives. As in Ratneshwar et al. (1987), they were instructed to state everything that went on in their minds while they made their choices. Caution was made to avoid cuing subjects to specific task aspects (Biehal and Chakravarti 1989).

Overall, each subject responded to four choice tasks (two choice tasks per product category - before and after new brand entry x two product categories). In accordance with prior research, the available options were presented in an alternative (row) by attribute (column) matrix format, as in Exhibit 1. The presentation order of the available options, product category, and type of stimulus description was randomized across the subjects. The entire procedure took from 30 to 45 minutes per subject to complete..

4 Measures

Attribute-based and Reason-based Processes. Subjects' protocols were separated into individual thoughts, and then coded by two independent judges into categories for attribute-oriented thoughts and reason-oriented thoughts. Thoughts related to the search for the dominance and/or compromise structure provided in the choice tasks were categorized as reason-based. Thoughts related to comparisons, evaluations, or other computations on attribute values, which do not reflect subjects' focus on the dominance and/or compromise structure were categorized as attribute-based. This study distinguished between these two decision mechanisms by determining the type of cognitive response (i.e., attribute-oriented or reason-oriented). The number of thoughts was used as an indicator of the extensiveness of the decision process. This measure is similar to that used by Sujan (1985) in the study of category-based and piecemeal processes underlying brand evaluations. Additional support can be found in Boush and Loken (1991), who employed similar measures to assess processes related to evaluations of brand extensions

Exhibit 2 presents the details of the coding procedure for the two-way decision processes. The criteria for determining the reason-based thoughts were largely based on the operations proposed by Montgomery (1989) for establishing of a dominance relationship. Given the purpose of this research, the operations were modified in such a way that the criteria covered dominance as well as compromise relationships objectively contained in the decision context. The criteria used in delineating the attribute-based thoughts come from the elementary information processes described by Johnson and Payne (1985). A count of the total number of elementary information processes (EIPs) used for

decision making provides a measure of the effort associated with the use of a certain decision strategy (Payne, Bettman, and Johnson 1988; 1992). This study is particularly concerned with consumers' evaluations, comparisons, or any other types of computations on attribute values that would indicate a construction of the overall worth of a specific alternative from the pieces of attribute information provided.

A word of caution is in order with respect to interpreting the coding procedure. For example, De-emphasizing and Bolstering, criteria for reason-oriented thoughts, appear to be similar to Comparing, a criteria for attribute-oriented thoughts. The distinstion between them lies in that de-emphasizing and bolstering primarily focus on the comparisons between brands between which there is a dominance relationship. Any thoughts related to comparisons between the dominanting and the dominated brand (such as, brands Y and X in Exhibit 2) are deemed to be indications of searching for the dominance relationship contained in the choice task. If comparisons occur between non-dominating brands (such as, brands Y and Z), the related thoughts are classified as the category of attribute-based processes as they do not involve the search for dominance structure contained in the choice task.

Exhibit 2
Coding Scheme for Responses

An Example of the Decision Task - Cars

	Brand X (decoy)	Brand Y (target)	Brand Z (competitor)
City mileage per gallon	34	32	19
Riding quality rating	40	60	80

Note: (a) Structurally, brand X is nearly dominated by brand Y but not by brand Z.
(b) Brand Y is a compromise or middle option in the three-alternative set.

Reason-oriented Thoughts

1. Search for Dominance Relationship
2. Search for Compromise Relationship

(a) *De-emphasizing* a given disadvantage of the near-dominating alternative or a given advantage of the nearly-dominated alternative.

Example: Brand Y (the near-dominating alternative) and Brand X (the nearly-dominated alternative) have similar city mileage per gallon (32 vs. 34 MPG).

(b) *Bolstering* a given advantage of the near-dominating alternative or a given disadvantage of the nearly-dominated alternative.

Example: Brand Y has a much higher ride quality rating than Brand X (60 vs. 40).

(c) *Cancelling* a given disadvantage of the near-dominating alternative by relating it to a disadvantage of the nearly-dominated alternative.

Example: The MPG of Brand Y is not as good as Brand X's, but Brand Y offers a much higher comfort than Brand X - big deal.

(d) *Compromising* the disadvantages of an alternative by relating it to the disadvantages of the other alternatives.

Example: Brand Y provides a fair compromise between MPG and comfort, and the others (Brands X and Z) tend to stretch to extremes.

Exhibit 2 - continued

Attribute-oriented Thoughts

Cognitive responses which do not reflect the search for
dominance and/or compromise relationships

(a)   *Comparing* two alternatives on an attribute.

      Example: Brand Z has a very low MPG than Brand Y (19 vs 32)

(b)   *Evaluating* an alternative along the attribute dimension.

      Example: The ride quality of Brand Y itself is acceptable.

(c)   *Calculating* the size of the difference of two alternatives for an attribute

      Example: The quality rating of Brand Z exceeds that of Brand Y by 20 points.

(d)   *Assessing* the size of the difference of two alternatives for an attribute.

      Example: The 20 point difference in quality rating between Brand Y and Brand Z is not significant for me.

(e)   *Computing* the ratio of one attribute over the other.

      Example: The ratio of gas mileage over ride quality for Brand Y is about 1/2 (32/60).

Relative Brand Evaluation. Subjects were asked to rate each alternative on three 7-point semantic differential scales anchored by the following points: unfavourable/favourable; bad/good; and unsatisfactory/satisfactory. These items have been commonly used as measures of brand evaluations or attitudes (Ajzen and Fishbein 1980). In this study, we are interested in relative rather than absolute brand evaluations. Specifically, we computed the before- and after-entry evaluation ratio for each item between the target and the competitor. The difference in the evaluation ratio indicates the relative change of one's evaluation of the target (compared to the competitor). A positive ratio difference ensues if a newly added alternative increases the perceptions about the target or decreases the perceptions about the competitor. Thus, the ratio difference for each item provides a measure of the relative evaluation of the target brand. The difference measure of brand evaluation used in this study is similar to the measure of relative preference proposed by Pan and Lehmann (1993). A direct measure of brand evaluation would fail to reveal the attraction effect that would have resulted from changes of brand perceptions following a new entry.

Brand Preference. Following Mishra et al. (1993), the instructions for preference ratings were: "Please indicate brand preferences on a 1-100 scale, giving most points to the brand you prefer most, and allocating points in proportion to the ratio of your preferences for the given brands (Make sure the points add up to 100)." There is evidence that the constant sum measure of preference is valid and reliable to predict brand choice (Mishra et al. 1993).

Brand Choice. Subjects were asked: "Given that you have to buy one brand based on this information alone, which one would it be ?" The responses to this question were used to measure brand choice, as in Mishra et al. (1993).

Attraction Effect. The attraction effect measure used in this study was adopted from Mishra et al. (1993). It computes the difference between the observed preference share of the target brand and the estimated share of the target derived from the principle of proportionality (Luce 1959). A positive difference found upon the addition of the new brand into the choice set signifies the occurrence of the attraction effect. Here, the attraction effect is defined as the net change in market share of the target brand after adjustment for the expected proportional loss based on the constant ratio model. As such, the existence of the attraction effect can lead to an increase or decrease in choice probability of the target brand with the introduction of a new brand (Mishra et al. 1993). A better understanding of this broader definition of the attraction effect can be seen from the following example given by Mishra et al. (1993).

Consider a core set share of 60 for the target brand X and 40 for the competitor Y. If the decoy Z captures a share of 20, the expected shares of brands X and Y will decline proportionately to 48 (= 60-20 x .6) and 32 (= 40-20 x .4), respectively. The attraction effect will exist i. the observed share of brand X (target) is greater than 48. This operationalization of the attraction effect allows us to test the decision processes at the individual level using structural equation models. For a detailed validation of this measure please refer to Mishra et ai. (1993).

Other Measures. The other measures used in this study included: choice confidence, confidence in brand evaluations, product familiarity, and attribute importance ratings. Choice confidence was measured by the question: "How confident are you in having made the best choice?" To measure confidence in brand evaluations, subjects responded to the item: "Rate the overall confidence about your evaluations of each brand using a 0 to 10 scale where 0=not confident at all and 10=extremely confident." Product familiarity was measured using an operationalization developed by Park (1976), in which subjects marked one of three levels of familiarity with each product category. Finally, the importance of attributes was measured using a 0 to 10 scale where 0=not important at all and 10=very important.

Chapter 5:

Data Analyses and Results

1 Manipulation Checks

1.1 Accountability

Subjects responded to three questions on 9-point scales. These were used as a manipulation check of accountability. The three questions were: (1) While you made your decisions, how much attention did you give in justifying your choices (Less/More)?, (2) When you made your final choices, how concerned were you about making bad decisions on your part (Not concerned at all/Very concerned)?; and (3) While you made your choices, how concerned were you about the possibility that your choices might be evaluated (Not concerned at all/Very concerned)? The responses to the three measures were compared for the high and low accountability conditions. All of the three items were rated significantly higher in the high condition than in the low condition, respectively (Mean = 5.70 versus 4.07, p < .001; Mean = 5.99 versus 3.98, p < .001; and Mean = 6.01 versus 3.75, p < .001). The results indicate that the accountability manipulation was effective for the subjects.

1.2 Information Ambiguity

Four items on 9-point scales were used to check the manipulation of information ambiguity for each of the two product classes. The anchor points of the scales ranged from "not at all" to "very much". The four items were: (1) How important was the attribute information?; (2) How useful was the attribute information?; (3) How meaningful was the attribute information; and (4) How helpful was the attribute information? Comparisons between the responses to these measures for the elaborated and original stimuli conditions were done. Compared to subjects in the original condition, subjects in the elaborated condition perceived the given information as significantly more important (Mean = 6.60 versus 4.80, p < .05 for cars; Mean = 7.35 versus 6.33, p < .01 for speakers), useful (Mean = 6.96 versus 4.90, p < .05 for cars; Mean = 7.19 versus 6.03, p < .01 for speakers), meaningful (Mean = 6.70 versus 4.73, p < .05 for cars; Mean = 7.10 versus 5.50, p < .01 for speakers), and helpful (Mean = 6.53 versus 4.95, p < .001 for cars; Mean = 6.90 versus 5.32, p < .01 for speakers). This pattern is identical across the two product categories.

2 Distinguishing a Reason-based Process from an Attribute-based Process

The research hypotheses in this study focus on a two-way decision process in producing the attraction effect: (1) the search for a dominance and/or a compromise relationship contained in the choice task (reason-based processing), and (2) the inferences of the values of alternatives from the available attribute information (attribute-based processing).

Subjects' responses were separated into individual thoughts and coded by two judges. The judges were blind to the hypotheses and the treatment conditions. The interjudge agreement was 85.4 percent. Disagreements were resolved through discussion, so that all responses were coded. Exhibit 3 gives the sample attribute-oriented thoughts and reason-oriented thoughts coded by the two judges.

Exhibit 3
A Sample of Attribute-based and Reason-based Processes

Choice Task - Cars

	Brand X (decoy)	Brand Y (target)	Brand Z (competitor)
City mileage per gallon	34	32	19
Ride quality rating	40	60	80

Notes: (a) Structurally, brand X is nearly dominated by brand Y but not by brand Z.
(b) Brand Y is a compromise or middle option in the three alternative set

Attribute-based Process

Subject 1 (chose brand Y)

■ The quality rating of brand Y is 60 which is good enough (*Evaluating*).
■ At the same time, its mileage per gallon is 32 which is much higher than that of brand Z (*Comparing*).

Subject 33 (chose brand Y)

■ With brand Y, you can obtain a fairly comfortable ride (*Evaluating*) with a relatively high gas mileage (*Evaluating*).

Subject 40 (chose brand Y)

■ Brand Y seemed more attractive than Z because the difference in MPG had more impact than the difference in the ride quality (*Assessing*).

Subject 63 (chose brand Y)

- The ride quality difference between Y and Z was less significant than the gas mileage difference between these two brands *(Assessing)*.
- With brand Y, you can get high mileage per gallon *(Evaluating)*, and also, maintain sufficient ride quality *(Evaluating)*.
- Brand X was eliminated because its poor ride quality really bothers me *(Evaluating)*.

Subject 118 (chose brand Y)

- For brand X versus brand Z, 15 points in MPG *(Calculating)* for 40 points in ride quality *(Calculating)* - that is, $2^{2.3}$ points/MPG.
- For brand Y versus brand Z, 13 points in MPG *(Calculating)* for 20 quality points *(Calculating)* - that is, $1^{1.2}$ points/MPG.
- For brand X versus Y, 2 points in MPG *(Calculating)* for 20 points in quality *(Calculating)* - that is, 10 points/MPG, which is an acceptable tradeoff *(Assessing)*.
- I am willing to give up 1 MPG for additional 10 points of ride quality *(Assessing)*.

Reason-based Process

Subject 3 (chose brand Y)

- Brand Y seemed much more favourable than brand X as the MPG differed by only 2 miles *(De-emphasizing)* and the ride quality was significantly superior *(Bolstering)*.

Subject 47 (chose brand Y)

- Brand Y is only a little less better than brand X in MPG *(De-emphasizing)*, but considerably outperforms over brand X in ride comfort *(Bolstering)*.

Subject 55 (chose brand Y)

- Brand Y is close to brand X in terms of mileage per gallon *(De-emphasizing)*, but its ride quality is significantly better *(Bolstering)*.

Subject 75 (chose brand Y)

- With similar mileage per gallon to brand X *(De-emphasizing)*, brand Y gives greater ride *(Bolstering)*.

Subject 85 (chose brand Y)

■   Brand Y falls in the middle on the ratings of mileage per gallon (*Compromising*) as well as on the ratings of ride quality (*Compromising*).

Subject 90 (chose brand Y)

■   The significant gain in ride quality from X to Y made up for the slightly lower MPG (*Cancelling*).

Subject 175 (chose brand Y)

■   Because the gas mileage rating between brands X and Y differed slightly (*De-emphasizing*), I chose comfort as the tie-breaker between brands X and Y (*Bolstering*).

Subject 182 (chose brand Y)

■   Brand Y is the car that I will buy, since both city mileage per gallon (*Compromising*) and ride quality rating (*Compromising*) are in the average range

Combination of Attribute-based and Reason-based Processes

Subject 41 (chose brand Y)

■   The mileage per gallon of brand X was only marginally better than brand Y (*De-emphasizing*) which had a much better ride quality (*Bolstering*)

■   Although brand Z had the best ride quality rating (*Evaluating*), the improvement over brand Y (60 vs. 80) wasn't enough to outweigh the fact that brand Z had a lousy gas mileage (*Assessing*).

Subject 44 (chose brand Y)

■   The discrepancy in miles per gallon between X and Y was minimal (*De-emphasizing*), with Y getting a much higher quality rating (*Bolstering*).

■   As for Z, I just wouldn't be willing to sacrifice gas mileage for the improved ride (*Assessing*).

■   The discrepancy in MPG between Y and Z is so large (*Assessing*) that the greater ride quality would simply not be worth it (*Assessing*).

Subject 82 (chose brand Y)

- Because of brand Z's poor gas mileage (*Evaluating*). I immediately put it out of my decision.
- Since brand Y's ride quality is higher than brand X's (*Bolstering*) and the gas mileage between the two is minimal (*De-emphasizing*). I settle for brand Y.

Subject 93 (chose brand Y)

- In an attempt to purchase the car with the highest gas mileage I would have chosen X (*Evaluating*).
- But, Y's gas mileage was only slightly lower than X (*De-emphasizing*), yet Y had a much better ride rating (*Bolstering*).
- Additionally, Y's ride quality itself was adequate (*Evaluating*).

Subject 98 (chose brand Y)

- In terms of mileage per gallon, brand Y is in the second place (*Evaluating*), but only 2 miles behind brand X (*De-emphasizing*).
- In terms of ride quality, Y is also in the second place (*Evaluating*).
- Even though Z is in the first place on ride rating (*Evaluating*), its gas mileage is very low (*Evaluating*).

Subject 104 (chose brand Y)

- Car X's gas mileage is excellent (*Evaluating*), but its bad ride is unforgivable (*Evaluating*).
- Compared to car X, car Y is a little more expensive to run (*De-emphasizing*), yet its ride quality is much better (*Bolstering*).
- Car Z has descend gas mileage (*Evaluating*).

Subject 117 (chose brand Y)

- Between X and Y, I would be purchasing a car that has a remarkably lower ride quality rating (*Bolstering*) for just two more MPGs (*De-emphasizing*).
- Between Y and Z, I would be losing 13 MPGs (*Calculating*) for a car that has a significantly better ride quality (*Comparing*).
- I would not want to sacrifice so many MPGs for ride quality (*Assessing*).
- I settle for the medium, which is brand Y (*Compromising*).

Subject 140 (chose brand Y)

- Given the gas mileage difference between X and Y is small (*De-emphasizing*). I chose Y over X because of the greater comfort (*Bolstering*).
- Z is the most comfortable car (*Evaluating*), but at the sacrifice of much gas mileage (*Evaluating*).
- The ride comfort of Y is quite good (*Evaluating*), with an acceptable MPG (*Evaluating*).

Subject 146 (chose brand Y)

- Brand Y gets almost as much mileage/gallon as brand X (*De-emphasizing*), and has a much higher ride quality rating than X (*Bolstering*), thus making the selection of Y a better deal.
- Despite the superior quality (*Evaluating*), Z sacrifices too much gas mileage (*Evaluating*).

Subject 183 (chose brand Y)

- Brand X was eliminated because its city mileage was just a bit better than brand Y (*De-emphasizing*), yet its ride quality rating was much worse than Y (*Bolstering*).
- Brand Z has the top quality (*Evaluating*), but it is very expensive to keep running (*Evaluating*).

Exhibit 3 - continued

Choice Task - Stereo speakers

	Brand X (competitor)	Brand Y (decoy)	Brand Z (Target)
Sound quality	80	60	70
Price/pair	$229	$169	$179

Notes   (a) Structurally, brand Y is nearly dominated by brand Z but not by brand X.
   (b) Brand Z is a compromise or middle option in the three-alternative set.

Attribute-based Process

Subject 12 (chose brand Z)

■ Though the superior sound (*Evaluating*), brand X costs too much (*Evaluating*).
■ Brand Z has reasonably good sound (*Evaluating*), with a relatively cheaper price (*Evaluating*).

Subject 53 (chose brand Z)

■ For brand Y, I would pay $169 to get 60 quality points.
■ For brand Z, I would pay $10 more (*Calculating*) for 10 more quality points (*Calculating*).
■ For brand X, I would pay $60 more (*Calculating*) for only additional 20 quality points (*Calculating*)
■ So it is not worth the price to choose brand X (*Assessing*).

Subject 94 (chose brand Z)

■ For a difference of only 10 points in sound quality between Z and X (*Calculating*), I save $50 for Z (*Calculating*), which is worth it (*Assessing*).
■ On the other hand, to save $10 (Calculating) and lose 10 points in sound quality (*Calculating*) from Z to Y is ridiculous (*Assessing*).

Subject 128 (chose brand Z)

- Between Z and Y, there is a 10 point difference in sound quality (*Calculating*) and a $10 difference in price (*Calculating*), thus, each added quality point costs only $1.
- However, between X and Z, a 10 point difference in sound quality (*Calculating*) costs additional $50 in price (*Calculating*), such that each added quality point costs $5.
- Therefore, Z has the best value (*Assessing*).

Subject 148 (chose brand Z)

- For brands Y and X, $60 difference (*Calculating*) for 20 points in quality (*Calculating*) so that each additional quality point costs $3.
- For brands Z and X, $50 difference (*Calculating*) for 10 points in quality (*Calculating*) so that each additional quality point costs $5.
- For brands Y and Z, $10 difference (*Calculating*) for 10 points in quality (*Calculating*), and each added point costs only $1.
- Therefore, brand Z is the cheapest in marginal cost for additional quality (*Assessing*).

Subject 149 (chose brand Z)

- From Y to X, sound quality increases by 20 points (*Calculating*), with an increase of $60 (*Calculating*).
- From Y to Z, sound quality is up by 10 points (*Calculating*), and price increases by $10 (*Calculating*).
- Therefore, Z is more economical (*Evaluating*), and quality efficient (*Evaluating*)

Subject 184 (chose brand Z)

- The ratio of price over quality for brand X is $2.86/quality (*Computing*)
- For brand Y, the ratio is $2.82/quality (*Computing*).
- For brand Z, it is $2.56/quality (*Computing*).
- So, the best quality for the best price is ' ι and Z (*Assessing*).

Subject 191 (chose brand Z)

- Comparing brands Y and Z, we can see a very small price difference for the difference in sound quality (*Assessing*) as opposed to the price difference between brands X and Z which is extremely high for the same sound quality difference as brands Y and Z (*Assessing*).

Reason-based Process

Subject 22 (chose brand Z)

■   Brand Z has advantages over Y as it is only $10 more expensive (*De-emphasizing*), but significantly better in sound (*Bolstering*).

Subject 33 (chose brand Z)

■   It is noted that for a price which is slightly more than brand Y (*De-emphasizing*) can obtain a much better sound of brand Z (*Bolstering*).

Subject 77 (chose brand Z)

■   Brand Z represents the best compromise between brands X and Y (*Compromising*).

Subject 84 (chose brand Z)

■   It seemed that the sound quality of brand Z was much better than brand Y (*Bolstering*), so I am willing to pay just a little more for the improved sound (*Cancelling*).

Subject 87 (chose brand Z)

■   It is just a $10 difference between brands Z and Y (*De-emphasizing*). but I would get a significantly different sound quality if I go for brand Z (*Bolstering*).

Subject 200 (chose brand Z)

■   Between brands Y and Z. I would chose Z since it is priced not very different from Y (*De-emphasizing*). and gives much better sound quality (*Bolstering*).

Combination of Attribute-based and Reason-based Processes

Subject 61 (chose brand Z)

■   I don't have the need for extremely precise sound quality speakers like X (*Evaluating*), particularly, when it has an unfair price (*Evaluating*).
■   I would not purchase Y either, because for $10 extra I would buy Z which quite superior to X in terms of sound quality (*Cancelling*).

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Subject 100 (chose brand Z)

- The price of brand Z is much lower than that of brand X (*Comparing*).
- However, the sound quality of brand X is not that much better than that of brand Z (*Comparing*).
- Besides, brand Z has a much better sound rating than brand Y (*Bolstering*) and costs only $10 more (*De-emphasizing*).

Subject 125 (chose brand Z)

- Brands Y and Z have a very slight price difference (*De-emphasizing*), but Z is considerably better in sound quality (*Bolstering*).
- Brand X is much more expensive (*Evaluating*), which makes its high quality less attractive (*Evaluating*).
- The sound quality of brands X and Z are both good (*Evaluating*), yet X's is slightly better (*Comparing*).
- However, brand Z is much less expensive than brand X (*Comparing*).
- Brand Z has an acceptable quality (*Evaluating*), with a decent price (*Evaluating*).

Subject 147 (chose brand Z)

- For a difference of only $10 (*De-emphasizing*), brands Y and Z appear to exhibit distinct difference in quality (*Bolstering*).
- It seems that the sound quality of brand Z is close to that of brand X (*Comparing*).
- Therefore, for less money I may get a reasonably good speaker like Z (*Assessing*).

Note that the reason-oriented thoughts differed from the attribute-oriented thoughts in that they explicitly reflect subjects' consideration of the dominance and/or compromise relationship provided in the choice task. The sample responses suggest that the target brand can be benefited not only from the choice set structure such as a dominance relationship but from inferences of attribute values as well. While explanations based on the reason-based process for the occurrence of the attraction effect may be described as violations of rationality. The attribute-based process, as found in the statements made by

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subjects 118 (for cars), 128, 148, and 149 (for speakers), may reflect more or less consumers' rational constructions or inferences about utilities of particular stimuli within the decision context. In fact, Wernerfelt (1995) recently suggested that the attraction effect may be generated through consumers' rational utilization of product information.

3 Two-Way ANOVA and MANOVA

In this section, both univariate and multivariate analyses of variance were performed separately for cars and speakers so as to examine the effects of accountability and information ambiguity on the measures of decision processes, relative brand evaluation, and the attraction effect. Note that the use of ANOVA and MANOVA aims to look at the general pattern of the impacts of the two experimental variables on the attraction processes. Its aim was not that of testing the proposed individual hypotheses.

As previously described, the two process measures were: the number of attribute-oriented thoughts (for attribute-based process) and the number of reason-oriented thoughts (for reason-based process). To measure relative brand evaluations, we computed the before- and after-entry brand judgment ratio between the target and the competitor (i.e., the two existing brands). The three measures of brand evaluation were: unfavourable/favourable, bad/good, and unsatisfactory/satisfactory. The difference in the evaluation ratio for each item between the after- and before-entry was taken as an indicator of relative evaluation of the target brand. Thus, relative evaluation of the target is higher if the ratio difference is positive. Finally, the attraction effect was measured by the difference between the observed preference of the target brand and the expected preference

of the target from the principle of proportionality. The attraction effect occurs if the difference is positive (Mishra et al. 1993).

3.1 Main Effect of Accountability

The results obtained from ANOVA and MANOVA (three alternative measures were available for relative brand evaluations) showed that there was a main effect of accountability on all the dependent measures for each product category: the number of attribute-oriented thoughts ($F(1, 196) = 30.113$, $p < .001$ for cars; $F(1, 196) = 17.356$, $p < .001$ for speakers), the number of reason-oriented thoughts ($F(1, 196) = 25.229$, $p < .001$ for cars; $F(1, 196) = 22.002$, $p < .001$ for speakers), relative brand evaluation (Wilks = .963, $p < .10$ Hotellings = .039, $p < .10$; Pillais = .038, $p < .10$ for cars; Wilks = .959, $p < .05$; Hotellings = .043, $p < .05$; Pillais = .042, $p < .05$ for speakers), and the attraction effect ($F(1, 196) = 9.824$, $P < .01$ for cars; $F(1, 196) = 9.333$, $p < .01$ for speakers).

The cell means of the dependent measures are shown in Table 3. Compared to subjects in the low accountability condition, subjects in the high accountability condition elicited more attribute-oriented thoughts (Mean = 2.44 versus 1.35 for cars; Mean = 1.84 versus 1.20 for speakers), more reason-oriented thoughts (Mean = 1.49 versus 0.80 for cars; Mean = 1.12 versus 0.56 for speakers), more positive evaluations of the target brand relative to the competitor (Mean = 0.85 versus 0.45, Mean = 0.75 versus 0.40, and Mean = 0.69 versus 0.39 for cars; Mean = 0.63 versus 0.22, Mean = 0.74 versus 0.30, and Mean = 0.80 versus 0.38 for speakers), as well as a stronger attraction effect (Mean

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= 1.19 versus 0.69 for cars; Mean = 1.03 versus 0.48 for speakers).

The above results provide support for Hypotheses 5 and 6. Note that the individual-level analyses of the impact of accountability on the attraction effect reported here is consistent with findings reported by Simonson (1989) at an aggregate level. The question still remains as to how accountability would have such an impact? We postulated earlier that it would occur because accountability has a greater impact on attribute-based and reason-based processes, which, in turn, lead to a stronger attraction effect directly and indirectly through more positive evaluation of the target brand relative to the competitor. This is depicted in the full model of Figure 5. The pattern of results already obtained sheds some light on our expectations. Nevertheless, for a more direct and comprehensive test of the structural relationships hypothesized in the full model, a causal modeling approach is required.

Table 3
Cell Means of Dependent Measures

Number of attribute-oriented thoughts[a]

<u>Cars</u>

	Low ambiguity	High ambiguity
Low accountability	1.38	1.32
High accountability	3.36	1.52

<u>Speakers</u>

	Low ambiguity	High ambiguity
Low accountability	1.30	1.10
High accountability	2.38	1.30

Number of reason-oriented thoughts[b]

<u>Cars</u>

	Low ambiguity	High ambiguity
Low accountability	0.78	0.82
High accountability	0.98	2.00

<u>Speakers</u>

	Low ambiguity	High ambiguity
Low accountability	0.52	0.60
High accountability	0.68	1.56

[a] Higher score indicates greater extensiveness of the attribute-based decision process.
[b] Higher score indicates greater extensiveness of the reason-based decision process

Table 3 - continued

*Relative evaluations about the target brand**

(a) unfavourable/favourable

<u>Cars</u>

	Low ambiguity	High ambiguity
Low accountability	0.39	0.51
High accountability	0.75	0.96

<u>Speakers</u>

	Low ambiguity	High ambiguity
Low accountability	0.22	0.23
High accountability	0.70	0.55

(b) bad/good

<u>Cars</u>

	Low ambiguity	High ambiguity
Low accountability	0.43	0.37
High accountability	0.72	0.79

<u>Speakers</u>

	Low ambiguity	High ambiguity
Low accountability	0.25	0.35
High accountability	0.88	0.61

* Relative evaluation of the target brand is defined as the target-competitor evaluation ratio difference between after- and before-entry of a new brand. Higher score indicates more positive change of one's evaluation of the target brand relative to the competitor after a new brand entry.

Table 3 - continued

(c) unsatisfactory/satisfactory

Cars

	Low ambiguity	High ambiguity
Low accountability	0.31	0.46
High accountability	0.56	0.83

Speakers

	Low ambiguity	High ambiguity
Low accountability	0.25	0.51
High accountability	0.81	0.79

Attraction effect[d]

Cars

	Low ambiguity	High ambiguity
Low accountability	0.59	0.79
High accountability	1.14	1.24

Speakers

	Low ambiguity	High ambiguity
Low accountability	0.45	0.52
High accountability	1.01	1.06

[d] The attraction effect is defined as the net change in preference share of the target brand after adjustment for the expected proportional loss based on the principle of proportionality Higher score indicates stronger attraction effect.

3.2 Main Effect of Information Ambiguity

A main effect for information ambiguity on the two process measures was obtained: the number of attribute-oriented thoughts ($F(1, 196) = 22.874$, $p < .001$ for cars; $F(1, 196) = 17.356$, $p < .001$ for speakers) and the number of reason-oriented thoughts ($F(1, 196) = 14.885$, $P < .001$ for cars; $F(1, 196) = 16.165$, $p < .001$ for speakers). However, there was no support for a main effect of information ambiguity on the other dependent measures: relative evaluation about the target brand (Wilks $= .971$, $p > .10$; Hotellings $= .030$, $p > .10$; Pillais $= .029$, $p > .10$ for cars; Wilks $= .972$, $p > .10$; Hotellings $= .029$, $p > .10$; Pillais $= .028$, $p > .10$ for speakers) and the attraction effect ($F(1, 196) = .912$, $p > .10$ for cars; $F(1, 196) = .108$, $p > .10$ for speakers). Thus, decision processes were different for subjects with different levels of information ambiguity. But, relative evaluation of the target brand and the attraction effect were not affected by the manipulation of information ambiguity. As before, the pattern of the effect for information ambiguity on all of the dependent measures was identical over cars and speakers.

As can be seen in Table 3, there were more attribute-oriented thoughts in the low ambiguity condition (Mean $= 2.37$ for cars; Mean $= 1.84$ for speakers) than in the high ambiguity condition (Mean $= 1.42$ for cars; Mean $= 1.20$ for speakers). Conversely, more reason-oriented thoughts were generated by subjects with high ambiguous information (Mean $= 1.41$ for cars; Mean $= 1.08$ for speakers) than by subjects with low ambiguous information (Mean $= 0.88$ for cars; Mean $= 0.60$ for speakers). Thus, Hypotheses 7 and 8 were supported, respectively.

Notice further that, there was no significant difference in the total number of

attribute-oriented thoughts and reason-oriented thoughts between the low and high ambiguity conditions ($F(1,196) = 3.27$, $p > .05$ for cars; $F(1,196) = .741$, $p > .10$ for speakers). This may account for the insignificant effect of the information ambiguity manipulation on both relative brand evaluation and the attraction effect. While attribute-based processing and reason-based processing are different decision processes, their outcomes with respect to eliciting brand evaluation and preference need not necessarily differ.

As reviewed before, previous researchers have shown mixed results regarding the role played by information ambiguity in the attraction effect. Several researchers (Simonson 1989; Simonson and Tversky 1992; Pan et al. 1995) have shown that the attraction effect is not affected by the meaningfulness of product stimuli. Others (Mishra et al. 1993; Ratneshwar et al. 1987), on the other hand, have found that the attraction effect decreases as information meaningfulness increases. Our results provide support for the former findings.

3.3 Interaction Effect of Accountability by Information Ambiguity

In addition to main effects, a significant accountability by information ambiguity interaction was also obtained. This interaction was significant for the two process measures: the number of attribute-oriented thoughts ($F(1, 196) = 20.076$, $P < .001$ for cars; $F(1, 196) = 8.203$, $P < .01$ for speakers) and the number of reason-oriented thoughts ($F(1, 196) = 12.723$, $p < .001$ for cars; $F(1, 196) = 11.226$, $p < .001$ for speakers). This suggests that the two accountability groups responded differently to low and high

ambiguity in the attribute information presented to them. Again, relative evaluation of the target brand and the attraction effect for the two accountability groups were not affected by low and high information ambiguity. This pattern of interaction effects was identical for cars and speakers.

As shown in Table 3, subjects who were more accountable produced a greater number of attribute-oriented thoughts in the low ambiguity condition than in the high ambiguity condition (Mean = 3.36 versus 1.52 for cars; Mean = 2.38 versus 1.30 for speakers). For less accountable subjects, there were no significant differences between the low and high ambiguity conditions with respect to the number of attribute-oriented thoughts (Mean = 1.38 versus 1.32 for cars; Mean = 1.30 versus 1.10 for speakers). Figure 7 is a graphic representation of this interaction. As such, the impact of the low or high information ambiguity on the attribute-based process was only significant for subjects who were more accountable for their decisions. Thus, Hypothesis 9 was supported.

Figure 7
Interaction Effect of Accountability by Information Ambiguity on Attribute-based Process
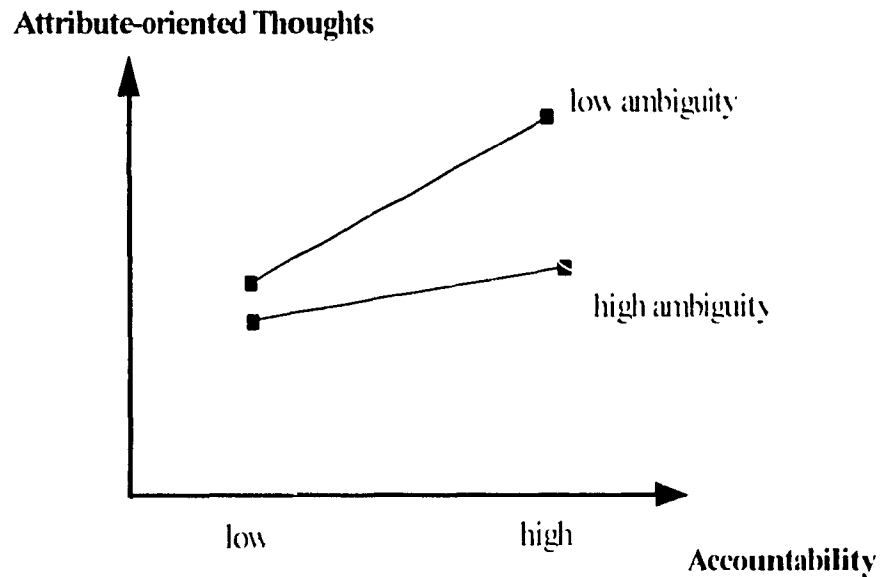
The interaction for the reason-based process is graphed in Figure 8. Subjects who were more accountable generated a greater number of reason-oriented thoughts in the high ambiguity condition than in the low ambiguity condition (Mean = 2.00 versus 0.98 for cars; Mean = 1.56 versus 0.68 for speakers). Subjects who were less accountable were not influenced in the number of reason-oriented thoughts by the manipulation of high or

low information ambiguity (Mean = 0.82 versus 0.78 for cars: Mean= 0.60 versus 0.52

for speakers). Thus, Hypothesis 10 was supported.

Figure 8
Interaction Effect of Accountability and Information Ambiguity on
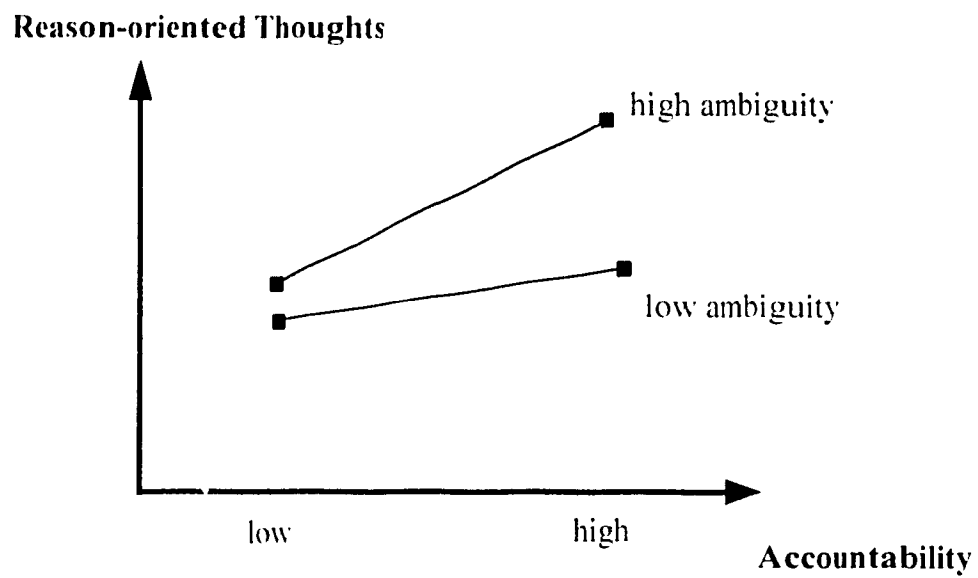**Reason-based Process**

Reason-oriented Thoughts

3.4 Summary

For each product class, the results provide substantial evidence that accountability has a positive influence on attribute-based and reason-based processes, relative brand evaluation, as well as the attraction effect. There is also evidence that information ambiguity elicits negative effect on the attribute-based process and positive effect on the reason-based process. However, no significant influence of information ambiguity on relative brand evaluation and the attraction effect is found. For subjects in the high accountability condition, the attribute-based process is greater when information ambiguity is low versus high. For subjects in the low accountability condition, on the other hand, the attribute-based process is not affected by the low or high information ambiguity. By contrast, accountable subjects are involved in a more reason-based process in the high ambiguity condition than in the low ambiguity condition, while for less accountable subjects, the reason-based process is not significantly influenced by the manipulation of information ambiguity.

The results obtained from ANOVA and MANOVA provide direct support for Hypotheses 5-10. However, for the other hypotheses pertaining to the structural relationships, as described in Figures 4 and 5, no obvious conclusion can be made at this point. Therefore, additional analyses are in order. Structural equation models will therefore provide a more comprehensive examination of our proposed conceptual framework.

4 The Analyses of Structural Equation Models: Test of Research Hypotheses

4.1 The Dual Processes of the Attraction Effect

The model in Figure 4 was estimated by the maximum likelihood (ML) procedure in LISREL 8 (Joreskog and Sorbom 1993). This model is primarily concerned with the attribute-based and reason-based processes involved in the occurrence of the attraction effect both directly and indirectly through overall brand evaluations. The direct relationships between the two-way processes and the attraction effect were implicitly stated in Hypotheses 1 and 2, while the indirect relationships were represented in Hypotheses 3 and 4. Figure 9 is a LISREL specification of the dual process model of the attraction effect. Parameters γ_1 and γ_2 are related to Hypotheses 1 and 2, respectively. Parameter γ_3 and γ_4 are related to Hypotheses 3 and 4, respectively. The hypothesized model was first analyzed separately for the two product categories (cars and stereo speakers). Then, comparisons between the two product classes were conducted so as to examine whether the pattern of the effects of the two-way processes on the attraction phenomenon was identical across product categories.

Figure 9
**Structural Equation Model Specification of the Dual Process
Model of the Attraction Effect**
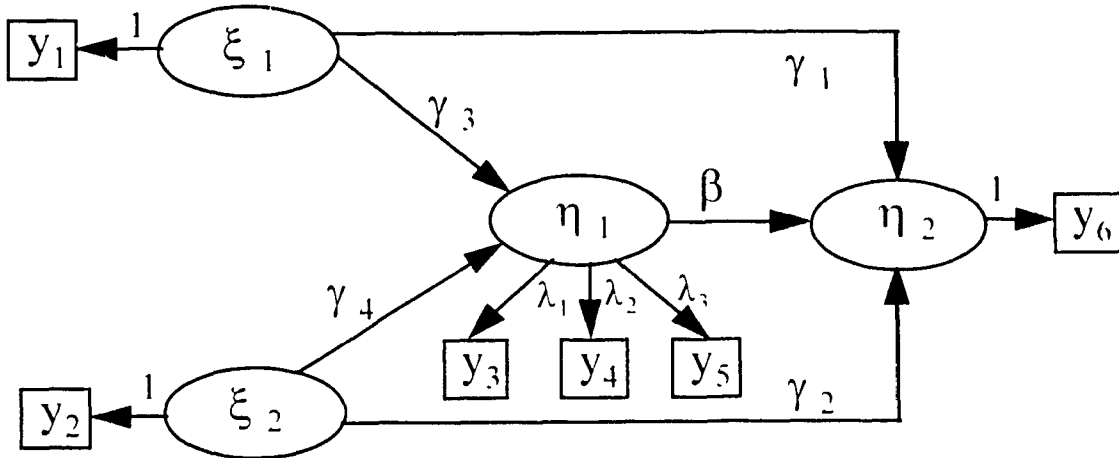
Legends:

ξ_1 = Attribute-oriented Thoughts; ξ_2 = Reason-oriented Thoughts;
η_1 = Relative Evaluation about the Target Brand; η_2 = The Attraction Effect.

4.1.1 Single Group Tests

Fitting of the LISREL Model

For cars, the hypothesized model, depicted in Figure 9, produced a χ^2-value of 4.76 with 6 degrees of freedom (p=.57). The adjusted goodness of fit index (AGFI) was .97. The corresponding Tucker and Lewis (1973) goodness-of-fit index was .99. The root mean square residual (RMSR) was .015. Thus, all of these goodness-of-fit indicators suggest that the model fits the data very well (Hair et al. 1993).

Similar results were also obtained for stereo speakers. The model gave a χ^2-value of 7.09 with 6 degrees of freedom (p=.31). The other goodness-of-fit indices were .96 for AGFI, .99 for the Tucker and Lewis index, and .018 for RMSR. Hence, the proposed model also has an excellent fit for the speakers data.

Parameter Estimates

The LISREL estimates of the parameters and their associated t-values are summarized in Table 4. As shown in the table, all of the structural relationships were significant for cars and speakers. In the case of cars, the significant values of γ_1 (.18, t = 2.78, p<.001) and γ_2 (.22, t = 3.47, p<.001) suggest that both attribute-based and reason-based processes had strong direct effects on the attraction phenomenon. Further, the indirect effects were also obtained as the significant estimated values of γ_3 (.20, t = 3.19, p<.001), γ_4 (.26, t = 4.16, p<.001), and β (.42, t = 5.19, p<.001).

For speakers, a similar pattern of structural relationships emerged with significant estimated values of .23 for γ_1 (t = 3.79, p<.001), .31 for γ_2 (t = 5.17, p<.001), .24

for γ_3 (t=3.94, p<.001), .25 for γ_4 (t=4.04, p<.001), and .39 for β (t=5.36, p<.001).

Thus, for each category, the results provide strong support for *Hypotheses 1-4*.

Figure 10 provides path coefficients so as to better visualize the results obtained in the proposed structural relationships.

Table 4
LISREL Estimates for the Dual Process Model
of the Attraction Effect

Parameters	Estimated values	
	Cars	Speakers
λ_1	1.00	1.00
λ_2	1.03 (16.31)	1.05 (20.29)
λ_3	.94 (14.50)	1.00 (18.61)
γ_1	.18 (2.78)	.23 (3.79)
γ_2	.22 (3.47)	.31 (5.17)
γ_3	.20 (3.19)	.24 (3.94)
γ_4	.26 (4.16)	.25 (4.04)
β	.42 (5.19)	.39 (5.36)
ϕ_1	1.00 (9.97)	1.00 (9.97)
ϕ_2	1.00 (9.97)	1.00 (9.97)
ϕ_{21}	-.09 (-1.23)	-.10 (-1.41)
ψ_1	.67 (7.47)	.69 (7.89)
ψ_2	.72 (9.79)	.65 (9.85)
$\theta_{\epsilon 1}$	.23 (6.25)	.20 (7.14)
$\theta_{\epsilon 2}$	.18 (5.13)	.12 (4.82)
$\theta_{\epsilon 3}$	.32 (7.74)	.20 (7.06)

Note: Data are maximum likelihood estimates. Numbers inside the parentheses are the t values of the estimates. Estimates without a t-value are fixed parameters.

Figure 10
Structural Coefficients for the Dual Process Model
of the Attraction Effect
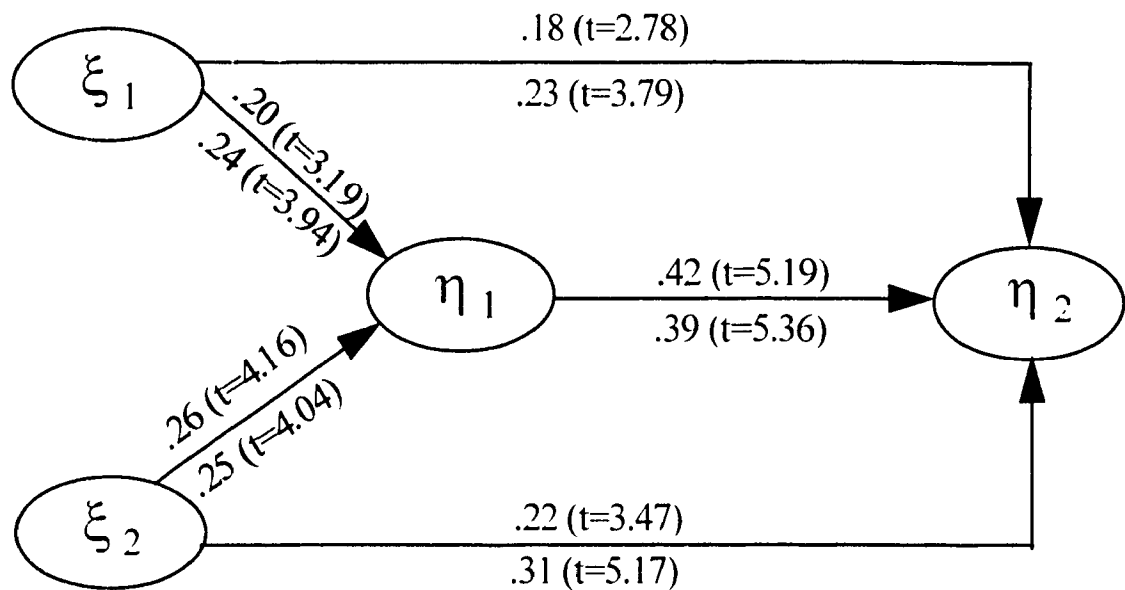
Legends:

ξ_1 = Attribute-oriented Thoughts; ξ_2 = Reason-oriented Thoughts;
η_1 = Relative Evaluation about the Target Brand; η_2 = The Attraction Effect.

Note: The numbers on the top of the lines are the structural estimates for cars, and the numbers on the bottom of the lines are for speakers. The t-values of the estimates are in the parentheses.

4.1.2 Comparisons Between Two Product Categories

This part of the analysis was to test the equality of the structural pattern (Figure 9) across product classes. The issue of interest here is whether the impacts of the two-way decision processes on the attraction effect are independent of product category. Hence, we tested the conceptual model (Figure 9) simultaneously for cars and speakers. Four alternative models with different restrictions on structural parameters were examined in this regard. In Model A, all of the structural parameters were freed across the two product classes. In Model B, the γ matrices were restricted to be equal for both product classes. In Model C, the β matrices were specified to be invariant for both cases. Model D incorporated Models B and C, in which the corresponding γ's and β were constrained to be equal across the products.

The Fitting of the Restricted Models

Model A gave a χ^2-value of 11.86 with 12 degrees of freedom ($p = .46$), a value of .99 for goodness of fit index (GFI), and a value of .018 for RMSR. The Tucker and Lewis index was .99. The results clearly indicated excellent fit. Similarly, all three other models (B, C, and D) fit the data well. A summary of the testing results is shown in Table 5.

Table 5
Results for the Dual Process Model of the Attraction Effect
With Multi-product Analysis (Cars and Speakers)

Model	Description	χ^2	df	p	GFI	TLI	RMSR
Model A	Unconstrained	11.86	12	.46	.99	.99	.018
Model B	γ's are invariant $(\gamma_1^{(1)} = \gamma_1^{(2)};\ \gamma_2^{(1)} = \gamma_2^{(2)};\ \gamma_3^{(1)} = \gamma_3^{(2)};\ \gamma_4^{(1)} = \gamma_4^{(2)})$	13.38	16	.64	.99	.99	.023
Model C	β's are invariant $(\beta^{(1)} = \beta^{(2)})$	11.91	13	.54	.99	.99	.019
Model D	Combination of Model B and Model C	13.42	17	.71	.99	.99	.024

Test of:

Equality of the γ matrices across product classes (B - A)	$\chi_d^2(4) = 1.52$,	$p > .10$
Equality of the β matrices across product classes (C - A)	$\chi_d^2(1) = 0.05$,	$p > .10$
Equality of the whole structural relations across product classes (D - A)	$\chi_d^2(5) = 1.56$,	$p > .10$

Note: GFI = Goodness-of-Fit Index, TLI = Tucker-Lewis Index; RMSR = Root Mean Square Residual.

To ascertain which alternative model fits the data bette1, χ^2 difference tests were conducted. As seen in the above table, this analysis revealed that there were no significant differences between the unconstrained model (A) and each of the three constrained models

(B, C, and D). Furthermore, all of the structural coefficients for the most restricted model

(Model D) were highly significant; $\gamma_1 = .20$ (t=4.66, p<.001), $\gamma_2 = .27$ (t=6.12, p< .001),

$\gamma_3 = .22$ (t=5.04, p<.001), $\gamma_4 = .25$ (t=5.79, p<.001), and $\beta = .40$ (t = 7.46, p<.001).

The above results strongly suggest that the structural pattern of the links between

the dual processes and the attraction effect was identical for cars and speakers[1].

Accordingly, one may conclude that the two-way decision processes for explaining the

attraction effect are independent of product category.

4.2 The Impacts of Accountability and Information Ambiguity

The analyses above primarily focus on the dual processes as determinants of the

attraction effect. For the robustness of the tests, we examined the attraction processes for

two product categories. In this section, we will further look at the potential impacts of

accountability and information ambiguity on the dual processes leading to the attraction

effect. Again, the tests were conducted for each product class separately.

Following the new procedures introduced by Bagozzi and Yi (1989) for the analysis

of experimental designs with structural equation models, Figure 11 illustrates the LISREL

specification for the 2 (accountability) x 2 (information ambiguity) design in the present

study. This full model describes the impacts of accountability and information ambiguity

on the attraction process.

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[1] One examiner was interested in how the asymmetry of the attribute information between cars and speakers (i.e., different types of attribute dimensions) might affect the validity of the results. The reported findings indicate that the dual process model of the attraction effect (Figure 4) is more valid, given the fact that we still obtained identical structural pattern across product categories even though they involved in information asymmetry.

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Figure 11
Structural Equation Model Specification of the
Full Model of the Attraction Effect
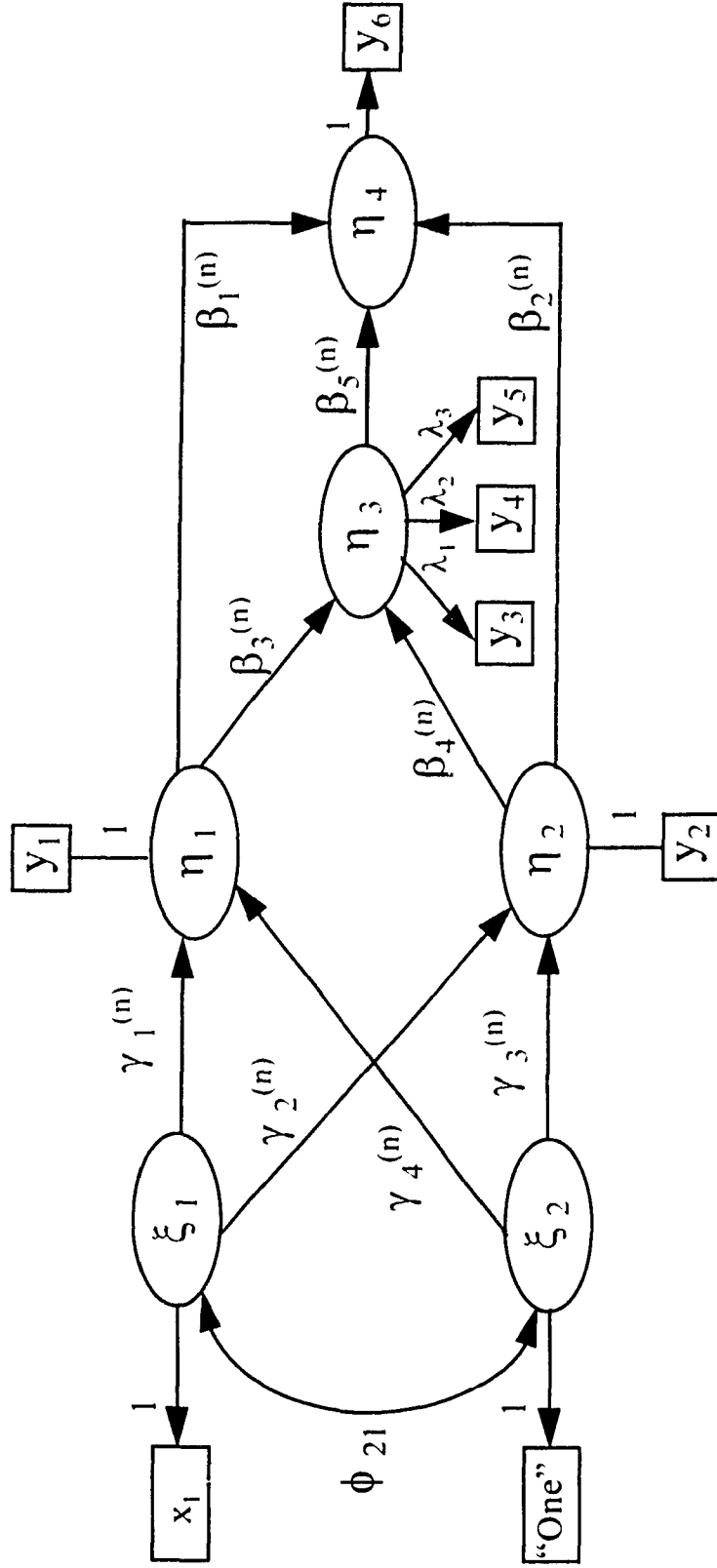
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Legends: ξ_1 = Accountability; ξ_2 = Pseudovariable; η_1 = Attribute-oriented Thoughts; η_2 = Reason-oriented Thoughts; η_3 = Relative Evaluation about the Target Brand; η_4 = The Attraction Effect. Low Ambiguity Condition, n=1; High Ambiguity Condition, n=2.

Here we took information ambiguity as a grouping variable and proceeded to divide the subjects into two groups - low and high information ambiguity. The dummy variable for each of the two groups was expressed as an exogenous latent variable (i.e., $\xi_1^{(n)}$, n=1 and 2) that was taken to represent the two levels of accountability. The dummy variable was given a value 0 for the low accountability condition and a value of 1 for the high accountability condition. A pseudovariable (i.e., "One") was used as another exogenous latent variable (i.e., $\xi_2^{(n)}$, n=1 and 2) so as to capture the means of dependent variables. This specification requires that the augmented moment matrix should be analyzed rather than the usual correlation or covariances matrices (Bagozzi and Yi 1989). The use of an augmented moment matrix usually leads to a nonzero correlation between the dummy variable and the presudovariable. Thus, the parameter $\phi_{21}^{(n)}$ (n=1 and 2) pertaining to the correlation between the two ksi variables is relaxed (for a detailed explanation of this procedure, see, Bagozzi and Yi 1989; Bagozzi, Yi, and Singh 1991).

As specified, $\gamma_1^{(1)}$ and $\gamma_1^{(2)}$ represent the differences in means of the attribute-based process for the two levels of accountability in the low and high ambiguity conditions, respectively. In contrast, $\gamma_2^{(1)}$ and $\gamma_2^{(2)}$ reflect the differences in means of the reason-based processes for the two levels of accountability in the conditions of low and high information ambiguity, respectively. The other specifications of the model for each group correspond to the direct and indirect influences of the two-way processes on the attraction effect, as depicted in Figure 9.

When there was no parameter constraint, the full model (Figure 11) yielded highly acceptable chi-square values for both cars and speakers (cars: $\chi^2(28) = 25.01$, p=.63;

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speakers: $\chi^2(28) = 27.39$, p = .50). This model (M1) served as the base point in the process of testing seven more constrained models (M2 to M8). Table 6 is a summary of the results for the full model with different restrictions on structural parameters. The parameter estimates and their associated t-values for the full model are presented in Table 7.

Table 6
Results for the Full Model of the Attraction Effect With
Multisample Analysis (Low and High Ambiguity Groups)

Model	Description	Goodness-of-fit	
		Cars	Speakers
M1	Full, unconstrained	$\chi^2(28) = 25.01$, p = .63	$\chi^2(28) = 27.39$, p = .50
M2	No interaction effects $(\gamma_1^{(1)} = \gamma_1^{(2)}; \gamma_2^{(1)} = \gamma_2^{(2)})$	$\chi^2(30) = 53.58$, p = .01	$\chi^2(30) = 44.64$, p = .04
M3	No main effects of accountability and no interaction effects $(\gamma_1^{(1)} = \gamma_1^{(2)} = \gamma_2^{(1)} = \gamma_2^{(2)} = 0)$	$\chi^2(32) = 103.30$, p = .00	$\chi^2(32) = 76.79$, p = .00
M4	Same as M1 except $\beta_1^{(1)} = \beta_1^{(2)}$	$\chi^2(29) = 26.51$, p = .60	$\chi^2(29) = 33.13$, p = .27
M5	Same as M1 except $\beta_3^{(1)} = \beta_3^{(2)}$	$\chi^2(29) = 28.23$, p = .51	$\chi^2(29) = 28.55$, p = .49 ·
M6	Same as M1 except $\beta_2^{(1)} = \beta_2^{(2)}$	$\chi^2(29) = 25.01$, p = .68	$\chi^2(29) = 28.82$, p = .47
M7	Same as M1 except $\beta_4^{(1)} = \beta_4^{(2)}$	$\chi^2(29) = 28.24$, p = .50	$\chi^2(29) = 27.40$, p = .55
M8	Same as M1 except $\beta_5^{(1)} = \beta_5^{(2)}$	$\chi^2(29) = 27.75$, p = .53	$\chi^2(29) = 30.41$, p = .39

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Table 6 - continued

Test of:

Interaction (M2 - M1)	$\chi_d^2(2) = 28.57$, $p < .001$	$\chi_d^2(2) = 17.25$, $p < .001$
Main effects of accountability (M3 - M2)	$\chi_d^2(2) = 49.72$, $p < .001$	$\chi_d^2(2) = 32.15$, $p < .001$
Equality of the direct influence of attribute-based process on the attraction effect (M4 - M1)	$\chi_d^2(1) = 1.50$, $p > .10$	$\chi_d^2(1) = 5.74$, $p < .05$
Equality of the impact of attribute-based process on relative brand evaluations (M5 - M1)	$\chi_d^2(1) = 3.22$, $p < .10$	$\chi_d^2(1) = 1.16$, $p > .10$
Equality of the direct influence of reason-based process on the attraction effect (M6 - M1)	$\chi_d^2(1) = 0.00$, $p > .10$	$\chi_d^2(1) = 1.43$, $p > .10$
Equality of the impact of reason-based process on relative brand evaluations (M7 - M1)	$\chi_d^2(1) = 3.23$, $p < .10$	$\chi_d^2(1) = 0.01$, $p > .10$
Equality of the influence of relative brand evaluation on the attraction effect (M8 - M1)	$\chi_d^2(1) = 2.74$, $p < .10$	$\chi_d^2(1) = 3.02$, $p < .10$

Table 7
Key Parameter Estimates for the Full Model (M1) With
Multisample Analysis (Low and High Ambiguity Groups)

Parameters	Estimated values			
	Cars		Speakers	
	Low ambiguity	High ambiguity	Low ambiguity	High ambiguity
$\gamma_1^{(n)}$	1.98 (7.20)	.20 (0.70)	1.08 (4.33)	.20 (1.13)
$\gamma_2^{(n)}$	.20 (1.00)	1.18 (6.35)	.16 (0.96)	.96 (5.70)
$\beta_1^{(n)}$	.21 (4.36)	.12 (2.00)	.26 (4.53)	.01 (0.07)
$\beta_2^{(n)}$	.27 (2.90)	.27 (3.59)	.24 (1.99)	.43 (4.26)
$\beta_3^{(n)}$	.20 (5.22)	.07 (1.16)	.21 (3.85)	.13 (2.61)
$\beta_4^{(n)}$	.18 (2.17)	.37 (5.32)	.24 (2.02)	.25 (4.82)
$\beta_5^{(n)}$	.27 (2.26)	55 (4.77)	.41 (3.88)	.81 (3.88)

Note: For the sake of simplicity, only the estimated values of the structural parameters (γ's and β's) are presented. Numbers inside the parentheses are the t-values of the estimates.

Models M2 and M3 tested the significance of the experimental main and interaction effects. Model M2 restricted the parameter γ_1 (i.e., $\gamma_1^{(1)} = \gamma_1^{(2)}$) to have the same estimated value across the two groups of information ambiguity and set the same constraint on parameter γ_2 (i.e., $\gamma_2^{(1)} = \gamma_2^{(2)}$). The two parameters were then fixed at a value of 0 in model M3 (i.e., $\gamma_1^{(1)} = \gamma_2^{(2)} = \gamma_2^{(1)} = \gamma_2^{(2)} = 0$). The interaction effects were tested by comparing models M1 and M2, while the main effects were examined by comparing models M2 and M3 (Bagozzi and Yi 1989). The chi-square difference tests showed that there were significant differences in fit between M1 and M2 for both product categories (cars: $\chi_d^2(2) = 28.57$, $p < .001$; speakers: $\chi_d^2(2) = 17.25$, $p < .001$). Thus, the effects of accountability on the two-way decision processes of the attraction effect varied with the levels of information ambiguity. Similarly, we also found highly significant chi-square

differences between M2 and M3 for both products (for cars: $\chi_d^2(2) = 49.72$, p < .001; for speakers: $\chi_d^2(2) = 32.15$, p < .001). Therefore, the main effects of accountability on the decision processes were confirmed, too. An examination of the individual parameter estimates is needed for the assessment of hypotheses (5, 6, 9, and 10) which are related to the obtained main and interaction effects.

Hypothesis 5 was the main effect of accountability on the use of attribute-based process. The higher level of accountability was expected to lead to greater use of attribute-based process. As shown in Table 7, γ_1, which pertains to the effect of accountability on the attribute-based process, was only significant in the low ambiguity condition (for cars, $\gamma_1^{(1)} = 1.98$, t = 7.20, p < .001; for speakers, $\gamma_1^{(1)} = 1.08$, t = 4.33, p < .001). Thus, Hypothesis 5 is partially supported. In previous ANOVA results, however, this hypothesis was fully confirmed. The reason is that the significant mean difference in the number of attribute-oriented thoughts between low and high accountable consumers exists only in the low level of information ambiguity but not in the high level of ambiguity (Table 3). Unlike ANOVA analysis, the LISREL approach analyzed the effect of accountability separately for the low and high ambiguity conditions. As a result, the insignificant difference in the number of attribute-oriented thoughts in the high level of information ambiguity can be identified. The findings suggest that the LISREL analysis is more comprehensive than the traditional ANOVA method.

Hypothesis 6 was the main effect of accountability on the use of reason-based process. An increase in accountability tends to increase the use of reason-based process. As can be seen in Table 7, γ_2, the coefficient associated with the effect of accountability

on the reason-based process, was significant only in the high ambiguity condition (for cars, $\gamma_2^{(2)}=1.18$, t=6.35, p<.001; for speakers, $\gamma_2^{(2)}=.96$, t=5.70, p<.001). Thus, Hypothesis 6 is also partially supported. Again, this result is not the same as that obtained by ANOVA analysis. Similar to the explanation for the discrepancy in Hypothesis 5, the significant difference in the use of the reason-based process between low and high accountable consumers in ANOVA reflects only the high ambiguity condition, while the pooled data between the two levels of information ambiguity hide ne insignificant effect of accountability in the low ambiguity condition. The approach used here distinguishes the two levels of information ambiguity, and as a result, the findings are more robust.

The results associated with Hypotheses 5 and 6 suggest that the effects of accountability on the two-way processes underlying the attraction effect depend on the quality of the attribute information presented.

Hypotheses 7 and 8 described the main effects of information ambiguity on the two-way decision processes. As previously tested with ANOVA, the two hypotheses are supported. Since we did not propose a hypothesis which related information ambiguity to the attraction effect in this study, the corresponding structural equation analyses were not performed for the two hypotheses.

Hypothesis 9 involved interaction effects of accountability by information ambiguity on the attribute-based process. It predicted that the effects of accountability on the attribute-based process in the low ambiguity condition will be greater than that in the high ambiguity condition (i.e., $\gamma_1^{(1)} > \gamma_1^{(2)}$). Individual parameter estimates in Table 7 confirm this hypothesis for both product categories (for cars, 1.98 versus 0.20; for

speakers, 1.08 versus 0.20).

Hypothesis 10 predicted interaction effects on the reason-based process. It suggests that accountability will tend to have a greater impact on the reason-based process when information ambiguity was high rather than low (i.e., $\gamma_2^{(2)} > \gamma_2^{(1)}$). Again this interaction hypothesis is supported for both products, as indicated by the parameter estimates in the high and low ambiguous groups (for cars, 1.18 versus 0.20; for speakers: 0.96 versus 0.16).

Hypothesis 11 further predicted that the attribute-based process will have a greater influence on the attraction effect at the low level of information ambiguity rather than at the high level (i.e., $\beta_1^{(1)} > \beta_1^{(2)}$). This hypothesis was tested by comparing the full model (M1) in Figure 11 to the restricted model (M4) with constraint: $\beta_1^{(1)} = \beta_1^{(2)}$. As shown in Table 6, the chi-square difference test between the two models was significant for speakers ($\chi_d^2(1) = 5.74$, $p < .05$), and insignificant for the product category of cars ($\chi_d^2(1) = 1.50$, $p > .10$). Thus, Hypothesis 11 is supported only for the case of speakers.

Hypothesis 12, as an alternative to Hypothesis 11, suggested that the attribute-based process will have a greater impact on overall evaluations of the target brand in the low rather than in the high ambiguity condition (i.e., $\beta_3^{(1)} > \beta_3^{(2)}$). To test this hypothesis, parameter β_3 was restricted to be invariant across the two ambiguity groups (i.e., $\beta_3^{(1)} = \beta_3^{(2)}$). The chi-square difference test between the full model (M1) with no constraint and the restricted model (M5) showed a marginally significant difference in fit for cars ($\chi_d^2(1) = 3.22$, $p < .10$) and no significant difference for speakers ($\chi_d^2(1) = 1.16$, $p > .10$). Thus, Hypothesis 12 is supported for the case of cars.

Hypothesis 13 suggested that the reason-based process will have a greater influence on the attraction effect when information ambiguity is high versus low (i.e., $\beta_2^{(2)} > \beta_2^{(1)}$). To test this hypothesis, we compared the full model (M1) and the restricted model (M6) with constraint: $\beta_2^{(2)} = \beta_2^{(1)}$. The chi-square difference test (Table 6) indicated that these two models are not significantly different in fit for each product class (for cars, $\chi_d^2(1) = ?$, p > .10; for speakers, $\chi_d^2(1) = 1.43$, p > .10). Therefore, Hypothesis 13 is not viable for either of the two product categories.

Hypothesis 14, as an alternative to Hypothesis 13, suggested that the reason-based process will have a greater impact on overall evaluations of the target brand in the high ambiguity condition rather than in the low ambiguity condition (i.e., $\beta_4^{(2)} > \beta_4^{(1)}$). This hypothesis was tested by comparing the full model (M1) and model M7 with constraint: $\beta_4^{(2)} = \beta_4^{(1)}$. The chi-square difference test showed a marginally significant difference in fit of the two tested models for cars ($\chi_d^2(1) = 3.23$, p < .10), but no significant difference for speakers ($\chi_d^2(1) = 1.43$, p > .10). As a result, Hypothesis 14 is supported for one product category.

Finally, *Hypothesis 15* assumed that the impact of relative evaluation of the target brand on the attraction effect will not vary with low or high levels of information ambiguity (i.e., $\beta_5^{(1)} = \beta_5^{(2)}$). To test this hypothesis, The full model (M1) was estimated by restricting parameter β_5 to be invariant in the two ambiguity groups (i.e., $\beta_5^{(1)} = \beta_5^{(2)}$). The chi-square difference test showed that the fit of the constrained model (M8) was significantly, though marginally, different from the full model (M1) for both product classes (for cars, $\chi_d^2(1) = 2.74$, p < .10; for speakers, $\chi_d^2(1) = 3.02$, p < .10). Therefore,

Hypothesis 15 is not supported for either of the two product categories. An examination of individual parameter estimates (Table 7) shows that the impact of relative brand evaluation on the attraction effect is greater in the high ambiguity condition (vs. low ambiguity) for both product classes (for cars: .55 versus .27; for speakers: .81 versus .41). This implies that the reason-based process had a greater influence on relative evaluation of the target brand than did the attribute-based process.

For a better visualization, Figure 12 presents the estimated structural coefficients for the full model of the attraction effect.

Figure 12
Structural Coefficients for the Full Model of the Attraction Effect
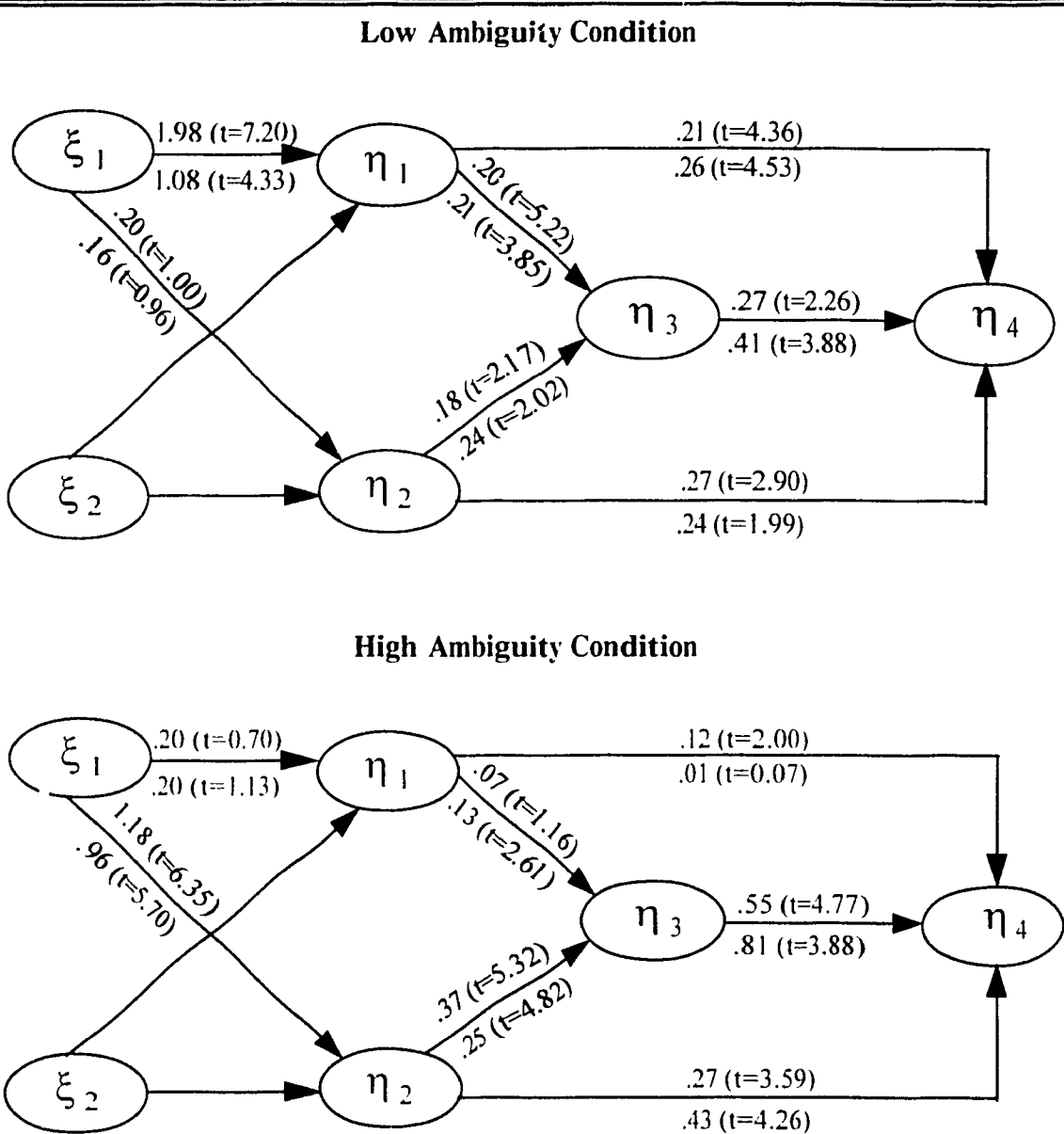
Low Ambiguity Condition

High Ambiguity Condition

Legends: ξ_1 = Accountability; ξ_2 = Pseudovariable; η_1 = Attribute-oriented Thoughts; η_2 = Reason-oriented Thoughts; η_3 = Relative Evaluation about the Target Brand; η_4 = The Attraction Effect. Low Ambiguity Condition, n=1; High Ambiguity Condition, n=2.

Note: The numbers on the top of the lines are the structural estimates for cars, and the numbers on the bottom of the lines are for speakers. The t-values of the estimates are in the parentheses.

4.3 Summary

The results from structural equation analyses indicate that the attraction effect is determined by both the attribute-based and reason-based processes. As hypothesized, the two-way decision processes affect the attraction effect directly as well as indirectly through their impacts on relative evaluation of the target brand. The dual decision processes underlying the attraction effect are comparable across the two product categories (cars and speakers).

For each of the two product classes, when product information is made less ambiguous (i.e., more meaningful), accountability produces a significantly positive impact on the attribute-based process. The attribute-oriented thoughts, in turn, lead to the attraction effect directly and indirectly through brand evaluation. However, accountability has an insignificant effect on the reason-based process in this situation, although the reason-based thoughts are significantly related to the attraction effect in both a direct and an indirect manner. Conversely, when information is made more ambiguous (i.e., less meaningful), accountability elicits a significantly positive impact on the reason-based process, which, in turn, causes the attraction effect directly and indirectly. However, there is no significant effect of accountability on the attribute-based process in this situation, even though a direct relationship between the attribute-based process and the attraction effect is observed for cars and an indirect relationship one is apparent for speakers.

Further, the obtained results show that the attribute-based process generates a greater impact (indirectly for cars and directly for speakers) on the attraction effect when information ambiguity is low as opposed to high. The reason-based process, on the other

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hand. only produces a greater impact indirectly on the attraction effect for cars when information ambiguity is high as opposed to low. Equally important, we also find that for both product classes, relative evaluation of the target brand has greater influence on the attraction effect in the high level of information ambiguity than in the low level of ambiguity.

Chapter 6:

Conclusions and Implications

1 Theoretical Implications

The results of this study provide insight into the occurrence of the previously observed attraction phenomenon. The main trust of this study rests in that a dominance and/or a compromise relationship contained in the choice task may lead to the attraction effect through two conceptually different decision processes, namely, attributed-based processing and reason-based processing.

The attribute-based processing reflects the theory of adaptive decision behaviour. Decision strategies are adaptive to the demands of the characteristics of the choice task When exposed to a relatively simple choice task, consumers tend to engage in deliberate processing of attribute values. In the decision context with a dominance and/or a compromise structure, consumers' comparisons, evaluations, or other effortful computations on attribute values tend to make the dominant or the compromise option look more attractive, thus, producing the attraction effect This decision process suggests that the attraction effect can be seen as a manifestation of consumers' using other alternatives

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to infer the values of a specific option in the choice set. Such a conceptualization of what underlies the attraction effect is consistent with the theoretical arguments made by Wernerfelt (1995). Using a number of examples, Wernerfelt describes the attraction phenomenon as an outcome of consumers' rational inferences about utilities from market offerings.

The reason-based processing reflects the theory of the search for reasons in choice. Consumers have the tendency to use a dominance or a compromise structure contained in the choice task as a justification for selecting the dominant or the compromise choice. This mechanism suggests that consumers can choose on the basis of the relationships between alternatives rather than comprehension or inferences of the attribute values of alternatives. The attraction phenomenon constructed through the dominance/compromise search can be seen as a manifestation of deviations from rationality in choice. In fact, a number of researchers (e.g., Simonson and Tversky 1993; Pan et al. 1995) have indicated that certain normative assumptions of consumer choice models such as value maximization are inadequate for understanding of the attraction effect and need to be relaxed in order to account for context effects.

While the attribute-based process and the reason-based process represent different constructions of the attraction effect, they are more complementary than competitive. Under certain situations, both decision processes may produce the attraction effect simultaneously. Specifically, this research shows that accountability increases the impact of both attribute-based and reason-based processes. However, there are also situations in which mainly one decision process may operate. We found that the attribute-based process

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predominated when attribute information was less ambiguous (or more meaningful) and the reason-based process predominated when attribute information was more ambiguous (or less meaningful). The general pattern of the impact of accountability and information ambiguity on the attraction processes is consistent with the contingent view of information processing (Payne 1982). This view suggests that consumer information processing can be facilitated or discouraged by individual and task factors such as accountability and information ambiguity.

Another notable point in the present research is the role of brand evaluations in producing the attraction effect. Our findings indicate that the attribute-based processing and the reason-based processing can generate more favourable evaluations of the target brand relative to the competitor after the addition of a new brand. The positive changes in relative evaluations of the target in turn cause the attraction effect. That is, the two-way decision processes have impacts on the attraction effect that operate through changes in relative brand evaluations. The need for consumers to develop and apply subjective brand judgments in the decision processes stems from consumers' limited cognitive capacities (Pan and Lehmann 1993).

In general, the framework proposed in this paper distinguishes between separate roles of attribute values and choice set structures in the observed attraction effect. Few previous studies have made such a distinction. Thus, the possible confounding effect that is created by the entry position and the brand' attribute values is not in perfect control (Lehmann and Pan 1994). The perspective highlighted here is potentially useful for a better understanding of context effects in choice. Furthermore, it offers a more

comprehensive schemata of the influences of other individual and task factors such as accountability and information ambiguity on the attraction phenomenon.

2 Marketing Implications

The separate roles of attribute levels and the available dominance/compromise relationships in the attraction phenomenon have profound implications for competitive strategies in new product design, promotion, advertising, and sales tactics.

For example, when designing a new product, managers should consider not only its attribute values, but also its possible position in relevant markets. An existing product can benefit when it dominates another product in the market. A firm that wishes to develop a new product may first introduce its inferior version so as to legitimize an improved version later on. Similarly, a firm that wants to help the sales of its principal (target) product may benefit from offering an inferior version to the relevant market. Although there may be some cannibalization, the firm might find the introduction of an inferior brand sensible as long as the loss of share for the firm's target brand is proportionately less in comparison to the loss incurred by a competitor's offerings (Mishra et al. 1993).

A product is generally at an advantage if it is advertised as a dominant or a compromise choice rather than as the only available option. It is even more advantageous for the target alternative if the potential consumers are highly accountable for their decisions. To increase the dominance or compromise effects, the comparative ad should not only direct consumers' attention to the target's dominant or compromise position but should also facilitate comparative inferences about the relevant alternatives.

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This raises yet another strategic issue, namely, what should a manager do if his/her company's product is not in either a dominant or a compromise position? The manager has at least three distinct options. First, s/he may change the consumer's choice set in a manner that excludes the less attractive object or increases the complexity of the choice set. The exclusion of the inferior choice serves to eliminate context effects, while the increase in task complexity is intended to distract the consumer's deliberate comparison processes on attribute values as well as the attention to the choice set structure such as a dominance relationship (Klein and Yadav 1989). This is likely to be a difficult and expensive proposition. Secondly, s/he may introduce an inferior alternative into the choice set so as to cancel the perceived advantages of the target product (as it already dominates another product in the market). The fundamental point of this strategy rests in using a dominance effect to attack another dominance advantage. This seems to be a feasible and cost-effective solution. Thirdly, s/he may improve the attribute level over which the company's product is inferior with respect to an existing product. Of course, the improvement should be technologically feasible and also make economic sense.

Ultimately, the findings in this study suggest that brand competition is both a race to meet consumer needs at attribute values and a battle to add distinctive cues such as a dominance relationship over the structure of the consumer's choice set. Therefore, marketers should devote resources not just to satisfy consumers better than competitors but to create value for consumers by shaping the context of preferences and consequently that of competition (Carpenter, Glazer, and Nakamoto 1994).

3 Research Limitations

As with any other experimental studies, the present research simplified the task environment in order to isolate the issues of interest. The limitations of this research specifically deal with the experimental environment. Firstly, only hypothetical brands were used. They were described on just two attributes and brand names were absent. In order to generalize the results, one should replicate this study using more realistic product stimuli.

Another caveat is that the product choice settings considered here included only two or three brands. It may be true that most consumer decisions are eventually made on the basis of a few alternatives in a choice set (e.g., Payne 1976; Lussier and Olshavsky 1979). However, it may be interesting to see how the attraction phenomenon will be affected as task complexity increases (i.e., increase the number of alternatives and/or the number of attributes per alternative).

A third limitation is that only retrospective protocols were used to measure decision processes in this study. The major concern with such protocol data is that subjects may give only simplified information about the preceding decision processes (Svenson 1979). However, this concern is partially mitigated, by the simplicity of the decision contexts considered in our experiment. In fact, our subjects did provide fairly elaborated thoughts regarding their decision processes. Nevertheless, other sensitive process tracing methods, such as Payne et al.'s (1988) monitoring of information acquisition, could provide a richer insight about the dual decision processes for explaining the attraction phenomenon.

4 Future Research

An extension of this work might involve observing the attraction effect under the decision environment of increased task complexity. Many interesting questions can be addressed in such research. These include the following: (1) Would consumers be able to detect a dominance relationship contained in a large choice set? (2) Do consumers really keep an inferior item in their final sets while they employ elimination rules to reduce the large choice set to a manageable size? (3) How likely are consumers to constitute a final choice structure with a compromise relationship? (4) Assuming that a final choice set includes an asymmetric dominance structure with more than three alternatives, say five, how does this affect the two-way decision processes leading to a possible attraction phenomenon?

A second area for future research would identify and investigate other factors that affect the relative impact of the two-way processes on the attraction effect. A number of factors may deserve future attention: including task involvement, product category knowledge, and perceived similarity of alternatives.

A third research issue was previously mentioned, namely using other process tracing techniques to assess the two-way decision processes. A noteworthy technique might be an information acquisition monitoring method used by Payne et al. (1988).

Finally, a longer term endeavour would be to extend the dual process model into a general framework for context effects in choice. One such extension may be the investigation of decision processes that lead to a negative attraction effect (i.e.,

substitution). The first step in this research would specify the decision contexts in which either positive or negative attraction occurs. It is expected that the process approach proposed here will enable us to gain much insight about the fundamental mechanisms underlying the two hypothesized conflicting effects (attraction and substitution) in choice.

5 Conclusion

The main purpose of this dissertation was to investigate the decision processes that lead to the attraction effect. We found that the attraction effect was an outcome of both an attribute-based process and a reason-based process. The attribute-based process reflects the influence of individual attributes whereas the reason-based process reflects the influence of choice set structures such as dominance and compromise relationships. The two-way decision processes produced the attraction phenomenon directly and indirectly through their impacts on relative brand evaluations. This pattern was held across product categories (cars and stereo speakers). Finally, it was found that the relative impacts of the two-way decision processes were affected by accountability and information ambiguity as well as their interactions.

A Summary of Previous Attraction Effect Studies

Major Studies	Subjects & Study design	Experimental Stimuli	Number of Alternatives	Number of Attributes	Structure of Choice Sets	Conceptual Explanations
Health & Chatterjee (1991)	University students; Between subjects	Beer	Two	Two	Dominance	The use of choice rule
Huber, Payne & Puto (1982)	University students; Between/Within subjects	Cars, Beer, Restaurants, Lotteries, Camera film, & TV sets	Two	Two	Dominance	The use of choice rule & Perceptual changes in attribute importance
Huber and Puto (1983)	University students; Between/Within subjects	Cars, Beer, Restaurants, Calculator batteries, & Camera film	Two & Three	Two & Three	Near-dominance	The use of choice rule
Kardes, Herr & Marlino (1989)	University students; Between subjects	Beer	Two	Two	Near-dominance	Perceptual changes in brand attitude judgments
Lehmann and Pan (1994)	University students; Between Within subjects	Orange juice, Cars, TV sets, Calculator batteries, Restaurants, Stock fund, Paper tower, Stereo speakers, Beer, Apartments, Computers, etc	Two & Eight	Two & Three	Dominance, Near-dominance & Compromise	Changes in consideration formation

Appendix I - continued

Major Studies	Subjects & Study design	Experimental Stimuli	Number of Alternatives	Number of Attributes	Structure of Choice Sets	Conceptual Explanations
Mishra, Umesh & Stern (1993)	University students; Within subjects	Beer, Cars, & TV sets	Two	Two	Dominance	Product knowledge, attribut meaningfulness. Task involvement. Decoy-target similarity. Relative brand preference. Decoy share, & Decoy popularity.
Pan & Lehmann (1993)	University students; Between/Within subjects	Cars, TV sets, Apartments, Calculator batteries, & Light bulb	Two & Three	Two	Dominance, Near-dominance & Compromise	Perceptual changes in brand similarity judgments
Pan, O'Curry & Pitts (1995)[a]	University students; Between subjects	Political candidates	Two	Two	Dominance	
Ratneshwar, Shocker & Stewart (1987)	University students; Between subjects	TV sets, Orange juice Beer, Cars, Barbecue grills, & Light bulbs	Two	Two	Dominance & Near-dominance	Product familiarity & attribute meaningfulness
Simonson (1989)	University students Between subjects	Beer, Cars, Apartments, Calculator, Calculator Mouthwash, TV sets, etc	Two	Two	Dominance, Near-dominance & Compromise	Need for justification

Appendix I - continued

Major Studies	Subjects & Study design	Experimental Stimuli	Number of Alternatives	Number of Attributes	Structure of Choice Sets	Conceptual Explanations
Simonson & Tversky (1992)	University students; Between subjects	Computers, Paper towers. Facial tissues. Gifts, Cameras. Microwave ovens Calculator batteries. Calculator. CD players, Dental insurance. Gasoline & Gambles	Two	Two	Dominance. Near-dominance, & Compromise	Perceptual framing of the decision task & The use of choice rule
Stewart (1989)	University students: Between Within Subjects	Beers & Chocolate candies	Two	Two	Near-dominance	Attribute Meaningfulness

᾿ This study focuses on the existence of the attraction effect in a political context

Appendix II

Questionnaire for Session 1
(Core Choice Sets)

Respondent No. _____ (Office use)   Version 1
****

Please read carefully

This study deals with brand preferences. Suppose you were shopping for yourselves and had to make brand choice decisions in each of the following two product categories: cars and stereo speakers. We are interested in how well your brand decisions are made. **Please note that your decisions will be evaluated individually, and you might be asked to justify your brand choices. Print your name on top of the questionnaire.**

The experiment consists of two sessions. In each session, you will be making several brand decisions and answering a number of questions. The two sessions together will take you about 25 minutes. Please do not hesitate to ask any question.

As in all experiments, you do not have to complete the experiment if you do not wish to. All responses that you give are strictly confidential. There are no physical or psychological risks associated with this study.

CONSENT FORM

This is to state that I agree to participate in research currently being conducted by Iianxi Zhou under the supervision of Professor Michel Laroche at Concordia University I have been informed that the general purpose of this research is to test consumer brand preferences.

In order to participate, I agree to take part in an experiment in which I will be making choices among alternatives in several product categories. However, I understand that I am free to withdraw my consent and to discontinue my participation at any time should I feel the need or the inclination to do so.

I am aware that after completing all the requirements of this study, I will be given $5 cash as for my participation.

AFTER CAREFULLY STUDYING THIS AGREEMENT, I NOW FREELY CONSENT TO PARTICIPATE IN THIS STUDY.

NAME (Please Print): _____

SIGNATURE: _____

WITNESS SIGNAIURE: _____

DATE: _____

Choice Task #1

Below you will find two brands of cars, which differ in the city mileage per gallon (MPG) and the ride quality ratings made by a reputed consumer magazine. You may assume that these two brands are similar on all other features, such as color, style, size, etc.

	Cars	
	Brand A	Brand B
City mileage per gallon	32	19
Ride quality rating	60	80

Detailed description of the ride quality ratings

60: The car's firm suspension gave a steady controlled ride on better roads. With a full load in the car, the ride was occasionally uncomfortable for the rear passengers, but on the whole, the ride quality was good.

80· The ride was majestic. The suspension with its electronically controlled automatic leveling, gave a smooth, gentle ride on even the worst roads. Only the very largest bumps caused some discomfort to the passengers.

Please answer the following questions:

1. Based on your preference, please distribute 100 points between these two brands, giving most points to the brand you prefer most (**allocate points in proportion to the ratio of your preferences for the brands and make sure the points add up to 100**).

        Brand A _____   Brand B _____

2. How likely would you choose each of the two brands (put a check mark at the most appropriate space) ?

                    Unlikely   Likely

    Brand A   ___: ___: ___: ___: ___: ___: ___: ___ ___

    Brand B   ___: ___: ___: ___: ___: ___: ___: ___ ___

3. Given that you had to buy one brand based on this information alone, which one would it be ? _____

4. How confident are you in having made the best choice?

            Not confident   Extremely
            at all   confident
                    ___: ___: ___: ___: ___: ___: ___: ___ ___

5. Please indicate how you would evaluate <u>Brand A</u> (put a check mark at the most appropriate space for each of the following items).

            Unfavorable___: ___: ___: ___: ___: ___: ___Favorable

            Bad___: ___: ___: ___: ___: ___: ___Good

            Unsatisfactory___: ___: ___: ___: ___: ___: ___Satisfactory

6. Please indicate how you would evaluate <u>Brand B</u> (put a check mark at the most appropriate space for each of the following items).

            Unfavorable___: ___: ___: ___: ___: ___: ___Favorable

            Bad___: ___: ___: ___: ___: ___: ___Good

            Unsatisfactory___: ___: ___: ___: ___: ___: ___Satisfactory

7. Rate the overall confidence about your evaluations of each brand using a 0 to 10 scale where 0 = not confident at all and 10 = extremely confident **(the points don't have to add up to 10)**

            Brand A ___   Brand B ___

Choice Task #2

Below you will find two brands of stereo speakers, which differ in the pair price and the sound quality ratings made by a reputed consumer magazine. You may assume that these two brands are similar on all other features. Some of the common features are listed.

Stereo speakers

Stereo speakers:	Common features are weight, bass capability, frequency response, impedance, etc.	
	Brand A	Brand B
Sound quality	70	80
Price/pair	$179	$229

Detailed description of the sound quality ratings

70: Sound has slight distortion, but few people can detect it.
80: Sound has virtually no distortion.

Please answer the following questions:

1. Based on your preference, please distribute 100 points between these two brands, giving most points to the brand you prefer most (**allocate points in proportion to the ratio of your preferences for the brands and make sure the points add up to 100**).

    Brand A _____   Brand B _____

2. How likely would you choose each of the two brands (put a check mark at the most appropriate space) ?

                Unlikely   Likely

    Brand A   ___: ___: ___: ___: ___: ___: ___: ___: ___

    Brand B   ___: ___: ___: ___: ___: ___: ___: ___: ___

3. Given that you had to buy one brand based on this information alone, which one would it be ? ____

4. How confident are you in having made the best choice?

        Not confident   Extremely
        at all   confident
                ___: ___: ___: ___: ___: ___: ___: ___: ___

5. Please indicate how you would evaluate Brand A (put a check mark at the most appropriate space for each of the following items).

        Unfavorable___: ___: ___: ___: ___: ___: ___Favorable

        Bad___: ___: ___: ___: ___: ___: ___Good

        Unsatisfactory___: ___: ___: ___: ___: ___: ___Satisfactory

6. Please indicate how you would evaluate Brand B (put a check mark at the most appropriate space for each of the following items).

        Unfavorable___: ___: ___: ___: ___: ___: ___Favorable

        Bad___: ___: ___: ___: ___: ___: ___Good

        Unsatisfactory___: ___: ___: ___: ___: ___: ___Satisfactory

7. Rate the overall confidence about your evaluations of each brand using a 0 to 10 scale where 0 = not confident at all and 10 = extremely confident (**the points don't have to add up to 10**).

        Brand A ____   Brand B ____

Appendix II - continued

Questionnaire for Session 2
(Three-alternative Choice Sets)

Respondent No. _____ (Office use)   Version 1
****

Please read carefully

In this second session, you will be given three brands in each product category. Following the choice task, you will once again respond to a number of questions. Recall that this study deals with brand preferences. **Please keep in mind that we are interested in how well your brand decisions are made. Your decisions will be evaluated individually, and you might be asked to justify your brand choices. Print your name on top of the questionnaire.**

The reason for breaking up the task into different session is to ensure that you do not get too tired in the entire experiment.

If you have any question, please do not hesitate to ask the attending experimenter.

Section A

Choice Task #1

Below you will find three brands of cars, which differ in the city mileage per gallon (MPG) and the ride quality ratings made by a reputed consumer magazine. You may assume that these three brands are similar on all other features, such as color, style, size, etc.

Cars

	Brand X	Brand Y	Brand Z
City mileage per gallon	34	32	19
Ride quality rating	40	60	80

Detailed description of the ride quality ratings

40: The car's suspension soaked up ordinary bumps and eased road hardness. Some occupants, however, were bothered by the car's tendency to rock a little sharply from side to side. Rough roads caused more noticeable, harsher motions. The suspension topped out over the biggest bumps.

60: The car's firm suspension gave a steady controlled ride on even rough roads. With a full load in the car, the ride was occasionally uncomfortable for the rear passengers, but on the whole, the ride quality was good.

80: The ride was majestic. The suspension with its electronically controlled automatic leveling, gave a smooth, gentle ride on almost all kinds of roads. Only the very largest bumps caused some discomfort to the passengers.

Please answer the following questions:

1. Based on your preference, please distribute 100 points among the brands, giving most points to the brand you prefer most (**allocate points in proportion to the ratio of your preferences for the brands and make sure the points add up to 100**).

    Brand X _____   Brand Y _____   Brand Z ____

2. How likely would you choose each of the three brands (put a check mark at the most appropriate space) ?

    Unlikely   Likely

    Brand X   ____: ____: ____:____: ____: ____: ____: ____: ____

    Brand Y   ____: ____: ____: ____: ____: ____: ____: ____: ____

    Brand Z   ____: ____: ____: ____: ____: ____: ____: ____: ____

3. Given that you had to buy one brand based on this information alone, which one would it be ? _____

4. Describe what you had done to arrive at this choice (**please state everything that went on in your mind while you made the decision, and be as detailed as possible**)

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5. How confident are you in having made the best choice?

Not confident   Extremely
at all   confident

___: ___: ___: ___: ___: ___: ___: ___: ___

6. How important was the given product information?

Not at all ___: ___: ___: ___: ___: ___: ___: ___: ___ Very much

7. How useful was the given product information?

Not at all ___: ___: ___: ___: ___: ___: ___: ___: ___ Very much

8. Please indicate how you would evaluate Brand X (put a check mark at the most appropriate space for each of the following items).

Unfavorable___: ___: ___: ___: ___: ___: ___Favorable

Bad___: ___: ___: ___: ___: ___: ___Good

Unsatisfactory___: ___: ___: ___: ___: ___: ___Satisfactory

9. Please indicate how you would evaluate Brand Y (put a check mark at the most appropriate space for each of the following items).

Unfavorable___: ___: ___: ___: ___: ___: ___Favorable

Bad___: ___: ___: ___: ___: ___: ___Good

Unsatisfactory___: ___: ___: ___: ___: ___: ___Satisfactory

10. Please indicate how you would evaluate Brand Z (put a check mark at the most appropriate space for each of the following items).

Unfavorable___: ___: ___: ___: ___: ___: ___Favorable

Bad___: ___: ___: ___: ___: ___: ___Good

Unsatisfactory___: ___: ___: ___: ___: ___: ___Satisfactory

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11. Rate the overall confidence about your evaluations of each brand using a 0 to 10 scale where 0 = not confident at all and 10 = extremely confident (**the points don't have to add up to 10**).

Brand X ___   Brand Y ___   Brand Z ___

12. How meaningful was the given product information?

Not at all ___ : ___ : ___ : ___ : ___ : ___ : ___ : ___ : ___ Very much

13. How ambiguous was the given product information?

Not at all ___ : ___ : ___ : ___ : ___ : ___ : ___ : ___ : ___ Very much

14. How helpful was the given product information?

Not at all ___ : ___ : ___ : ___ : ___ : ___ : ___ : ___ : ___ Very much

Choice Task #2

Below you will find three brands of stereo speakers, which differ in the pair price and the sound quality ratings made by a reputed consumer magazine. You may assume that these three brands are similar on all other features. Some of the common features are listed.

Stereo speakers

Stereo speakers:	Common features are weight, bass capability, frequency response, impedance, etc.		
	Brand X	Brand Y	Brand Z
Sound quality	80	60	70
Price/pair	$229	$169	$179

Detailed description of the sound quality ratings

60:    Sound has somewhat distortion from perfection, but most listeners will not find it serious enough to be objectionable.

70:    Sound has slight distortion, but few people can detect it.

80:    Sound has virtually no distortion.

Please answer the following questions:

1. Based on your preference, please distribute 100 points among the brands, giving most points to the brand you prefer most (**allocate points in proportion to the ratio of your preferences for the brands and make sure the points add up to 100).**

    Brand X _____   Brand Y _____   Brand Z _____

2. How likely would you choose each of the three brands (put a check mark at the most appropriate space) ?

    Unlikely   Likely

    Brand X   ___: ___: ___: ___: ___: ___: ___: ___: ___

    Brand Y   ___: ___: ___: ___: ___: ___: ___: ___: ___

    Brand Z   ___: ___: ___: ___: ___: ___: ___: ___: ___

3. Given that you had to buy one brand based on this information alone, which one would it be ? _____

4. Describe what you had done to arrive at this choice (**please state everything that went on in your mind while you made the decision, and be as detailed as possible).**

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5. How confident are you in having made the best choice?

Not confident
at all

Extremely
confident

___: ___: ___: ___: ___: ___: ___: ___: ___

6. How important was the given product information?

Not at all ___: ___: ___: ___: ___: ___: ___: ___: ___Very much

7. How useful was the given product information?

Not at all ___: ___: ___: ___: ___: ___: ___: ___: ___ Very much

8. Please indicate how you would evaluate <u>Brand X</u> (put a check mark at the most appropriate space for each of the following items).

Unfavorable___: ___: ___: ___: ___: ___: ___Favorable

Bad___: ___: ___: ___: ___: ___: ___Good

Unsatisfactory___: ___: ___: ___: ___: ___: ___Satisfactory

9. Please indicate how you would evaluate <u>Brand Y</u> (put a check mark at the most appropriate space for each of the following items).

Unfavorable___: ___: ___: ___: ___: ___: ___Favorable

Bad___: ___: ___: ___: ___: ___: ___Good

Unsatisfactory___: ___: ___: ___: ___: ___: ___Satisfactory

10. Please indicate how you would evaluate <u>Brand Z</u> (put a check mark at the most appropriate space for each of the following items).

Unfavorable___: ___: ___: ___: ___: ___: ___Favorable

Bad___: ___: ___: ___: ___: ___: ___Good

Unsatisfactory___: ___: ___: ___: ___: ___: ___Satisfactory

11. Rate the overall confidence about your evaluations of each brand using a 0 to 10 scale where 0 = not confident at all and 10 = extremely confident (**the points don't have to add up to 10**).

Brand X ___   Brand Y ___   Brand Z ___

12. How meaningful was the given product information?

Not at all ___: ___: ___: ___: ___: ___: ___: ___: ___ Very much

13. How ambiguous was the given product information?

Not at all ___: ___: ___: ___: ___: ___: ___: ___: ___ Very much

14. How helpful was the given product information?

Not at all ___: ___: ___: ___: ___: ___: ___: ___: ___ Very much

Section B:

1. While you made your decisions, how much attention did you give in justifying your choices to others?

Less ___: ___: ___: ___: ___: ___: ___: ___: ___ More

2. When you made your final choices, how concerned were you about possible bad decisions on your part?

Not concerned   Very
at all   concerned

___: ___: ___: ___: ___: ___: ___: ___: ___

3.	While you made your choices, how concerned were you about the possibility that your choices might be evaluated?

Not concerned   Very
at all   concerned

___:___:___:___:___:___:___:___:___

4.	If you were asked to justify your final choices, how easy would it be?

Not at all ___:___:___:___:___:___:___:___:___ Very much

5.	If you are asked to justify your decisions, how much effort do you have to put in seeking good reasons?

Not at all ___:___:___:___:___:___:___:___:___ Very much

6.	In making your decisions, how much attention did you give in weighing the advantages and disadvantages of each alternative?

Not at all ___:___:___:___:___:___:___:___:___ Very much

7.	Suppose you were asked to provide reasons why your final choices are the best, how easy would it be to defend your reasons against other's criticisms?

Not at all ___:___:___:___:___:___:___:___:___ Very much

8.	How difficult is the choice task?

Not difficult   Very
at all   difficult

___:___:___:___:___:___:___:___:___

9.	I seek reasons for my choices.

Disagree ___:___:___:___:___:___:___:___:___ Agree

10   I didn't use all given information but only the most important pieces of information in making my final choices.

Disagree ___: ___: ___: ___: ___: ___: ___: ___: ___ Agree

11.   I was very concerned with my choices being criticized by others.

Disagree ___: ___: ___: ___: ___: ___: ___: ___: ___ Agree

12.   I considered explicitly the information presented with all of the brands in making my final decisions.

Disagree ___: ___: ___: ___: ___: ___: ___: ___: ___Agree

13.   Please make an individual assessment of which of the following three descriptions is most appropriate in your case for each of the two product categories under consideration.

(a)   I am quite unfamiliar with this product in the sense that I do not have a clear idea about which product characteristics are really important ones in providing me with maximum usage satisfaction.

(b)   I am somewhat familiar with this product in the sense that I have a somewhat clear idea about which product characteristics are really important ones in providing me with maximum usage satisfaction.

(c)   I am quite familiar with this product in the sense that I have a clear idea about which product characteristics are really important ones in providing me with maximum usage satisfaction.

Cars ___   Stereo speakers ___

14.   Rate the importance of attributes using a 0 to 10 scale where 0 = not important at all and 10 = very important (the points don't have to add up to 10).

Cars: Mileage per gallon ___   Ride quality ___

Speakers: Sound quality ___   Price ___

Section C:

1. Are you: _____ Male _____ Female

2. Your age is: _____

3. Your major is: _____

4. The degree/diploma/certificate tha. you are now studying for is: _____

- Thank you -

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