

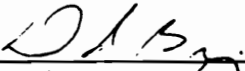
**AN INVESTIGATION INTO PRICE-QUALITY TRADEOFFS: THE EFFECTS  
OF ORDER OF PRESENTATION AND PRESENTATION OF OUTLYING  
ALTERNATIVES**

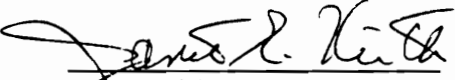
by  
Carol W. DeMoranville

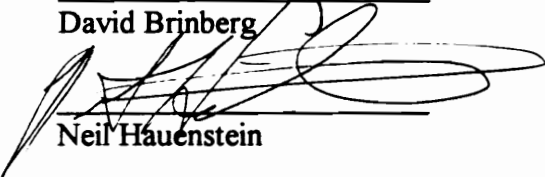
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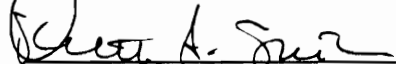
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**ABSTRACT**

In virtually every buying decision, consumers must make tradeoffs among levels of product attributes. One of the most frequent kinds of tradeoffs is that between price and quality. This research investigates the effects of two controllable variables on price-quality tradeoffs; the price/quality order in which alternatives are presented and whether alternatives outside the range of buyer expectations (outliers) are presented. The level of the final reference point is suggested to mediate order and outliers effects on the dependent variables of evaluation, search length, price-quality choice, and satisfaction. In addition, the effects of order and outliers on buyer-seller relationship quality are examined. A measurement problem precluded determination of final reference point as a mediating variable, but the other effects were as predicted by final reference points. Presenting alternatives in a descending order of price and quality resulted in less search than an ascending order. Primacy effects were evident as the descending order also resulted in choices of higher price and quality than both ascending and random orders. Moderate

outliers also resulted in higher price-quality choices than either no outliers or extreme outliers, but only when presented in a descending order. There were no significant effects on evaluation of alternatives. Perceptions of buyer-seller relationship were better when alternatives were presented in an ascending order as compared to a descending order, but were not affected by presenting outliers. Buyer's satisfaction was lower when an extreme outlier was included in choice set presented in an ascending order.

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## **CHAPTER 1 INTRODUCTION**

In virtually every buying decision, consumers must make tradeoffs among levels of product attributes. One of the more frequent of these tradeoffs is that between price and quality, where quality is defined as a product's overall capability of providing utility (e.g., Archibald, Haulman, and Moody 1983). Price and quality are negatively correlated in many product-markets (Gerstner 1985), so buyers must often decide between purchasing a lower priced good with lesser quality or a higher priced good with better quality. Little is known about the factors that affect whether the consumer is more willing to trade a low price to get high quality or to trade high quality to get a low price, or how these tradeoffs affect choice outcomes. This dissertation will explore the nature of price-quality tradeoffs in an effort to answer this research question.

There is evidence that the composition of the consideration set affects people's preferences for products that are described by price and quality (Simonson and Tversky 1992). Therefore, factors that affect consideration set composition appear likely to affect price-quality tradeoffs. While many factors affect consideration set composition, marketers are most interested in the effects of those that they can control. In personal selling situations where the buyer sequentially evaluates alternatives and can make a choice at any time, two such factors are the order in which salespeople present alternatives to the buyer and the presentation of outliers, or alternatives that would not normally have been part of the buyer's consideration set.

This research proposes that reference points provide an explanatory mechanism for the effects of order and outlying alternatives on evaluation, choice, and choice outcomes. Reference points are defined as the standard to which other objects are compared (Rosch

1975). In this research, that standard for comparison is the buyer's expectation of the levels of quality and price that will be achieved with the purchase. Previous research has shown that order affects reference points and evaluation (Della Bitta and Monroe 1974), outliers affect reference points and choice (Urbany, Bearden, and Weilbaker 1988), and changes in reference points affect preference and choice (Payne, Laughunn, and Crum 1980, Tversky and Kahneman 1991). Therefore, it seems likely that the level of the final reference point mediates order and outlier effects on evaluation and choice.

The proposed model (Figure 1) suggests that three variables that affect the consumers' final reference points for price and quality are: 1) the initial reference point; 2) the order in which the buyer evaluates the alternatives; and 3) whether any evaluated alternatives are outliers with extreme values of price or quality. The final reference points of price and quality are hypothesized to affect how long the buyer searches before choosing, the specific price-quality tradeoff the buyer makes (choice), how the buyer evaluates alternatives, and how satisfied the buyer is with the choice.

In addition to search length, choice, product evaluation, and satisfaction with choice, marketers are interested in maintaining a good relationship between the buyer and the seller. A buyer is more likely to intend to make future purchases with the same salesperson if the quality of the relationship is high (Crosby, Evans, and Cowles 1990). It is also likely that s/he may recommend that salesperson or firm to others. If order or outliers affect relationship quality marketers would like to know what those effects are. The model shows that buyer-seller relationships may be influenced by the presentation of outliers; however, this effect is proposed to be direct rather than mediated by final reference points.

The rest of this chapter will first briefly examine the concept of price-quality tradeoffs and suggest why reference points may help understand the specific price-quality

tradeoffs buyers make. It then discusses the two sales presentation variables predicted to affect price-quality tradeoffs through adaptation of the initial reference point. Next, it supports the selection of the dependent variables and identifies the general method for investigating the research issues. Finally, the chapter discusses the potential contributions of the research.

### **Price-Quality Tradeoffs**

In product-markets where price and quality are negatively correlated, people must often make tradeoffs between paying a high price for a product of high quality or paying a low price for a product of lesser quality. Economic utility theory states that a buyer's preference for levels of price and quality can be predicted by his/her utility functions for price and quality. However, economic utility theory can not adequately explain price-quality tradeoffs because it has been shown that context factors, such as consideration set composition, affect choice.

In an investigation of tradeoffs between two negatively correlated attributes, Simonson and Tversky (1992) found that when choosing from a three-alternative set defined on just two attributes, people tended to prefer the compromise alternative. However, an exception occurred when the two attributes describing the three alternatives were price and quality. People tended to prefer the high price, high quality alternative to the low price, low quality one - a phenomenon Simonson and Tversky called polarization. They suggested that consumers are more reluctant to trade off quality because it is generally more important than price when making a purchase. However, if the importance of quality causes polarization, then the high quality alternative should always be preferred regardless of consideration set size, and that is not the case. In two-alternative sets, preferences are relatively equal for the low price/low quality and high price/high quality

alternatives (Simonson and Tversky 1992). Thus it appears that the importance of quality is also inadequate to explain the phenomenon of price-quality tradeoffs.

Reference points may help explain price-quality tradeoffs and the effects of other variables on those tradeoffs. Consumers often have some reference point, or expectation, for what they hope to achieve in the way of product quality and price. Reference points are standards to which other objects are compared (Rosch 1975) and are known to adapt to the levels of stimuli that an organism encounters (Helson 1964, Della Bitta and Monroe 1974). A consumer's reference points for price and quality will change in response to the levels of price and quality of the product alternatives that s/he evaluates. Therefore, the specific consideration set composition should cause adaptation of the initial reference point and, in turn, how the products in that set are judged with respect to the adapted reference point and to each other. Those comparative judgments are what determine which product appears most favorable in terms of both price and quality and may help explain why changes in the composition of the consideration set also change preferences. In order to understand these price quality tradeoffs, this paper next presents two sales presentation variables that are likely to influence reference points.

## **Independent Variables**

### *Initial Reference Points*

While many factors may affect the level of a final reference point, one that is expected to exert significant influence is the level at which it initially existed. In the model, the initial reference points are the buyer's expectations about the level of quality that will be received and the price that will be paid for this purchase. These expectations are brought into the purchase decision prior to the presentation of alternatives. The initial

reference points are measured, not manipulated, in this study and are used as a covariate in the data analysis.

### *Order of Presentation*

The order of presentation of alternatives in sequential search is one method of changing consideration set composition and, therefore, affecting reference point adaptation. If buyers can stop and choose a product at any time during sequential search, they may end up evaluating only a subset of the available alternatives. The specific composition of that subset depends upon the order in which the alternatives are presented and how long a buyer searches. If buyers evaluate different subsets of alternatives, then choice may change due to the availability of particular alternatives or because final reference points for quality and price, and subsequent preferences, differ.

Order of presentation may also affect reference point adaptation because the first alternative evaluated by the consumer can either act as an anchor for price-quality judgments, or serve as a reference for the kinds of price-quality tradeoffs that have to be made in the market. The first alternative should therefore have a disproportionate impact on the buyer's final reference point. A consumer who first evaluates a high price, high quality product should therefore respond differently to subsequent products than a consumer who first evaluates a low price, low quality product. Thus the order in which alternatives are presented can conceivably affect the kinds of tradeoffs made between price and quality.

A trend in price or quality over several alternatives is a third method by which order could affect consideration set composition and reference point adaptation. An increasing level of quality over a series of alternatives might provide positive reinforcement for additional search, prompting the buyer to search longer. Furthermore, trends in order have been shown to affect the adaptation level (Helson 1964) and the

judgment of the average price of a series of products (Della Bitta and Monroe 1974). Therefore, trends in quality and price across a series of alternatives should affect the buyer's final reference points for price and quality which, in turn, may affect the evaluation of specific products, choice, and satisfaction.

### *Presentation of Outlying Alternatives*

Another marketer-controlled technique of changing the consideration set composition is the presentation of an outlying alternative; that is, one that would not have normally been considered for purchase because it is outside the boundaries of what the buyer expects on at least one criterion. An outlier alternative with distinctively greater quality and higher price should cause the buyer's reference points for price and quality to adapt in that direction (Helson 1964). The remaining alternatives in the evaluated set would then appear less attractive with respect to quality (but more attractive in price) than if no outlier had been presented. These changes could prompt the buyer to choose a different option than s/he would have if the outlier had not been evaluated.

There may be limits to how extreme an outlier can be and still cause reference point adaptation. An extremely discrepant alternative may be more likely to be perceived as a member of a different product category and, therefore, not affect the adaptation of the buyer's price and quality reference points. Extremely discrepant alternatives would not, then, affect evaluation of other alternatives, choice, or satisfaction with choice.

### **Dependent Variables**

There is no question that marketers are interested in how their products are evaluated and whether their product is likely to be chosen from a given set of products. Shifts in reference points can change evaluation and choice (Payne, Laughhunn, and Crum 1980, Tversky and Kahneman 1991), so it is likely that variables that affect reference points will also affect evaluation and choice.



Satisfaction is also a variable of considerable interest to marketers. If the buyer is satisfied with the choice s/he is more likely to make a repeat purchase of the same product (LaBarbera and Mazursky 1983). Satisfaction is generally conceptualized as a function of performance and the comparison of pre-purchase expectations to actual post-purchase experience (Oliver 1993). Pre-purchase expectations serve as a reference point, so variables that affect the reference point will also affect satisfaction.

How long the search process lasts is an important consideration for both the marketer and the buyer. This is especially true when products are sold by personal selling. Given that the buyer makes a satisfactory choice, the longer the buyer has to search before choosing, the less efficient the selling process is for both parties. Personal selling is often costly for marketing firms, and evaluating products is costly for consumers in terms of time, effort, and economic loss. This effort can be both cognitive, such as determining which product is best, and physical, such as traveling from one location to another to evaluate different alternatives. Thus, given that the buyer is satisfied with the purchase, it is strategically desirable to minimize search length in order to limit both the seller's and buyer's costs. Marketers may be able to reduce search length by manipulating the specific products a buyer evaluates.

As stated previously, the final dependent variable, buyer's perception of relationship quality, is not expected to be mediated by reference point adaptation. However, because it is likely to be affected by the independent variables and may be of considerable interest to marketers it is included in the research design. To the extent that a buyer thinks the salesperson is providing appropriate and relevant product and market information for choice, s/he is likely to perceive the relationship as positive. If a buyer thinks that the salesperson is manipulating information for personal gain, such as a higher priced sale, s/he is likely to perceive the buyer-seller relationship more negatively. Sales

presentation techniques, such as ordering a product array or showing outliers, may affect the buyers' perceptions of the salespersons' motivations, and as such, may influence perceptions of the buyer-seller relationship.

### **Research Method**

The two independent variables, order of presentation and outlying alternatives will be experimentally manipulated to assess their effects on the dependent variables. Real estate purchases will be the context of the experiment because it involves sequential search and offers a natural setting for controlling presentation order and outliers. Furthermore, a negative price-quality relationship exists in housing markets in that homes with more attributes and higher quality tend to have higher prices and price and quality tradeoffs are likely to occur in the choice process.

### **Research Contributions**

This research will make contributions on both conceptual and substantive levels. Markets in which price and quality are negatively correlated and must be traded off in an effort to purchase a satisfactory product are common. A polarization effect has been found for price and quality such that low quality appears to be more aversive than high price. Simonson and Tversky (1992) called for more research to better understand the conditions that lead to this effect. This research will investigate how selected context and individual variables affect price-quality tradeoffs and polarization.

At the substantive level, the findings have several important applications for marketing practice. Order and outlier effects have considerable implications for marketing strategy when salespeople present the alternatives to the buyer. Common examples where this occurs include real estate, insurance policies, and, to some extent, automobiles and other products sold by specialty retailers. All of these represent important, long-term decisions for consumers.

Knowing the specific effects of order of evaluation and presence of outliers on price-quality tradeoffs, the length of search, and the buyer's satisfaction will enable marketers to improve the effectiveness and efficiency of sales presentations. Selling effectiveness could be increased by inducing the buyer to purchase a target product and/or increasing the buyer's satisfaction with the purchase. Selling efficiency could be increased by decreasing the length of the buyer's search, thus saving time and effort for both the buyer and the seller. Increasing the buyer's perception of relationship quality may improve future selling effectiveness through repeat purchases by the same buyer and/or the buyer's recommendation of the salesperson to others.

This research suggests that the level of the final reference point mediates the relationship between the independent and dependent variables. It proposes measures of price and quality reference points that may provide evidence for that mediating relationship. Regardless of the specific mechanism, however, the relationship between the independent and dependent variables is of substantial interest to marketers who can control the presentation of alternatives to buyers. Even in shopping situations where salespeople don't present products to the consumer, marketers can exert some indirect control over order and outliers through distribution strategy, advertising, and product displays. Therefore, the effects of order and outliers on choice and choice outcomes should be of considerable interest to marketers in any buying situation.

In summary, this research will investigate factors that affect the price-quality tradeoffs that consumers make and how those tradeoffs affect choice and choice outcomes. The specific research questions are:

- 1) How does the order of presentation of alternatives affect final reference points, length of search, price-quality choice, evaluation of alternatives, satisfaction, and the buyer-seller relationship?

- 2) How does the presentation of outlying alternatives affect final reference points, price-quality choice, evaluation of alternatives, satisfaction, and buyer-seller relationship quality?

This chapter presented the research questions, discussed the domain of interest, and defined the general constructs of the research. It suggested that order of presentation of alternatives and presentation of outlying alternatives will affect the price-quality tradeoffs a consumer makes through adaptation of initial price and quality reference points. The next chapter discusses the extant literature on price-quality tradeoffs and the effects of order and outliers, and presents the research hypotheses.

## **CHAPTER 2 CONCEPTUAL FOUNDATION**

This chapter contains the conceptual foundation for the study and the specific research hypotheses. I first summarize the literature on price-quality tradeoffs and suggest that reference point adaptation provides a conceptual explanation for those tradeoff effects. Next, I discuss the theoretical foundation of reference point adaptation, define reference point as it is used in this research, and defend the selection of price and quality reference points as determinants of evaluation and choice. Finally, I develop and present the research hypotheses for the effects of order of presentation and presentation of outlying alternatives.

### **Price-Quality Tradeoffs**

In many purchase situations, consumers must choose between paying a high price for a high quality product, or settling for lower quality at a lower price. Several theoretical and managerial important questions arise with respect to these tradeoffs. If consumers have to make tradeoffs between price and quality, in what direction are those tradeoffs likely to occur and what factors might affect the direction of the tradeoff?

Economic theory predicts that preferences for price-quality tradeoffs are determined by a person's utility functions for price and quality. However, empirical evidence indicates that preferences are not strictly functions of utility but are also sensitive to context factors (Simonson and Tversky 1992, Simonson, Nowlis, and Lemon 1993). The following review summarizes the literature relative to these issues.

Simonson and Tversky (1992) looked at how contextual variables affect preferences for tradeoffs. Over a wide range of products described by two negatively correlated attributes other than price and quality, they found that preference for an alternative differed depending upon the composition of the consideration set. Subjects preferred a given alternative more when it was in a three-alternative set where it had middle levels of both attributes than when it was in a two-alternative set where it had an extreme level of either alternative. For example, in Figure 2-a, B is more preferred when it is a member of the set {A,B,C} than when it is a member of set {A,B} or set {B,C}. In short, the alternative was preferred more when it was a compromise between two other alternatives. Simonson and Tversky suggested that this was because, when the two attributes are evaluated as equally important, the disadvantages of selecting an alternative that performs worst on one attribute looms larger than the advantages of the best performance on the second attribute. Therefore, the alternative that has no extreme disadvantage is preferred (a compromise effect).

The compromise effect, however, sometimes disappeared when the alternatives were described by the attributes of price and quality, and the highest quality alternative was more preferred than the middle alternative (Simonson and Tversky 1992). In other cases, the middle alternative was still preferred but it tended to draw more share from the low-quality alternative than from the high-quality alternative, an effect Simonson and Tversky called polarization. Figure 2-b shows alternatives described by price and quality. In this diagram, A is the lowest priced-lowest quality alternative and C is the highest priced-highest quality alternative. In polarization, adding the compromise alternative B to

a set of two products  $\{A,C\}$  reduced the share of the lowest priced, lowest quality alternative relative to the share of the highest quality, highest priced alternative (C). In effect, subjects showed an extremeness aversion to low quality but not to high price. They were more willing to trade a good price to get good quality than they were to trade good quality to get a good price when there were three alternatives in the set than when there were only two. This finding cannot be explained using classical economic theory because a person's utility functions for price and quality should not vary with contextual changes such as consideration set composition.

Simonson and Tversky (1992) suggested that the polarization effect (extremeness aversion to low quality) may be a function of the greater importance of quality in the decision because it defines the goal for the purchase while price is the means to reach that goal. However, even though quality may be more important than price, it appears to be an inadequate explanation of the polarization effect because if quality is more important, than the higher quality alternative should be equally preferred regardless of the context. A study by Simonson, Nowlis, and Lemon (1993) provides some evidence for another factor that may better explicate the phenomenon of price-quality tradeoffs.

Simonson, Nowlis, and Lemon (1993) explored context effects on price-quality tradeoffs and found that polarization disappeared when subjects first made a choice from each of the three local sets  $\{A,B\}$ ,  $\{B,C\}$ , and  $\{A,C\}$  before choosing from the global set  $\{A,B,C\}$ . The low quality, low price alternative did not fare as badly in the reduced local sets and the local pairwise preferences appeared to determine choice in the subsequent global set. Polarization reappeared when subjects were shown the global set and

instructed to make the pairwise comparisons within that set. Simonson, Nowlis, and Lemon (1993) concluded that polarization was a function of the set configuration when preferences were formed, not a result of the actual process of pairwise comparison. This result is important because it indicates that it is the context factor that causes the polarization effect, not the cognitive comparison process. It also implies that preferences for price-quality tradeoffs are affected by the particular set of products a consumer sees. Thus, salespeople could affect product preferences and subsequent choice by presenting specific subsets of alternatives for the consumer's evaluation.

Both Simonson and Tversky (1992) and Simonson et al (1993) found that polarization occurs even when an extreme alternative was labeled as being unavailable. Thus, it appears that the presence of the range of attribute values, either by the appearance of the alternatives in a consideration set or the knowledge of existing but unavailable alternatives, can cause greater relative preference for a higher priced, higher quality alternative.

The question then arises: what theory would parsimoniously explain why the contextual factors of consideration set composition and attribute range knowledge affect preferences for price-quality tradeoffs? The theory of reference points is a likely candidate to link changes in context and preferences. First, context has been shown to affect reference points (Tversky and Kahneman 1991). For example, the range of attribute values serves as a context factor that provides a reference for evaluating alternatives. A beer that costs \$4.25 in a restaurant may be judged expensive if the range of beer prices is \$1.00 to \$4.50 but inexpensive if that price range is \$4.00 to \$7.50. Second, changes in



reference points have been shown to affect preferences for alternatives (Payne, Laughunn and Crum 1980, Puto 1987, Rowe and Puto 1987, Kahneman 1992).

In summary, it is known that context factors such as consideration set configuration and knowledge of the range of alternatives can affect preferences for alternatives and that people appear to have a greater loss aversion for quality so that price-quality tradeoffs are often made in favor of high quality. However, a lot is still unknown about when and why a consumer would choose a particular price-quality tradeoff. Economic utility theory and quality importance are not adequate explanations of contextual effects on price-quality tradeoffs. Other theories of choice, such as attitude and multiattribute models, don't incorporate context factors and, as such, are also inadequate explanations of price-quality tradeoff phenomena. The concept of reference points may better explain why and when consumers trade away a low price for high quality and how context changes the perceptions of the benefits of those tradeoffs.

There are reasons, however, to question the generalizability of compromise and polarization effects to the kinds of multi-attribute choice common in many consumer purchases. Compromise and polarization effects have, to this point, been investigated using simultaneous evaluations of two- or three-alternative sets that vary on only two attributes (Simonson 1989, Simonson and Tversky 1992, Simonson, Nowlis, and Lemon 1993). It is unclear whether the same effects also obtain when subjects make sequential evaluations of a greater number of multiattribute alternatives. In sequential search, the consumer's knowledge of the range of attribute values may change with each alternative s/he evaluates. Unless all alternatives are searched, the full range of alternative values is

unknown. Thus, sequential search may be similar to the Simonson, Nowlis, and Lemon (1993) task in which polarization disappeared in that the full range of attribute values is unknown. Furthermore, if all alternatives are not examined during sequential search, the sequence of presentation will determine which products are members of the consideration set and, therefore, can affect preferences.

Prior research has focused on two-dimensional alternatives. Multiattribute comparisons between alternatives may be more difficult in sequential evaluations because of the cognitive effort required to maintain attribute values of each alternative in working memory. In simultaneous choice, the attribute values of all alternatives are available for inspection as the consumer makes comparisons between alternatives. In sequential choice, only the attribute values of the current alternative are available for inspection. The attribute values of previously evaluated alternatives are available only if they can be retrieved from memory. As the number of evaluated alternatives increases, comparisons in sequential choice may become more difficult because of increased demands on recall from memory. As the difficulty of comparisons increases, perceptions of the relative differences between alternatives may become less distinct. The high quality-high price alternative may be less obvious than in two attribute choices, and, as such, polarization effects may not occur.

The issue of whether compromise and/or polarization effects occur in sequential search is further complicated by the potential use of multiple reference points. Corfman (1991) shows that consumers can use more than one reference point to evaluate

alternatives. If evaluations of multiattribute alternatives make use of multiple reference points, will compromise and/or polarization still occur?

This research will further explore the nature of compromise and polarization effects by investigating the nature of price-quality tradeoffs in sequential search processes for multiattribute alternatives. This section contained a review of the relevant literature on price-quality tradeoffs and the suggestion that reference points may provide the conceptual link between context factors and preferences. In the next section I present the theoretical foundation for reference point effects by reviewing the literature that links context and reference points and the literature that links reference points with price-quality tradeoffs as they affect evaluation and choice. I then define reference points as they are used in this research and defend the use of the two reference points of price and quality.

### **Reference Points**

Rosch (1975) defines a reference point as a standard to which other objects are compared. A consumer who makes a purchase choice from a number of alternatives may use a reference point to compare those alternatives in an effort to determine which is the best. When evaluating a product, a consumer may use one or more reference points for price, i.e., the typical price, the price last paid, or some other reference price, to help evaluate the attractiveness of the product's price (Klein and Oglethorpe 1987). Similarly, s/he may also use one or more reference points for quality to determine the attractiveness of the product's quality. Consumers may even have more sophisticated reference points for price-quality relationships to determine whether the additional quality is worth paying

a higher price or, conversely, whether the lower price is worth the sacrifice in quality (Simonson and Tversky 1991). Because reference points are used to evaluate objects, the theoretical framework of reference points should help understand how consumers perceive price-quality tradeoffs when comparing purchase alternatives.

The concept of reference point is derived from adaptation level, defined by Helson (1964) as a state of non-responsiveness to stimuli at the same level. If an organism is exposed to a stimulus at a different level from the adaptation level, the organism responds to the stimulus and the adaptation level moves in the direction of the stimulus. In this sense, adaptation level is a dynamic concept that changes with exposure to stimuli. Although adaptation level theory was developed from experiments using psychophysical stimuli such as light and weight, a reference point should respond similarly to perceptual stimuli because it is the cognitive analog of adaptation level. There is empirical evidence that supports this assumption (Hunt and Volkman 1937, Helson unpublished, both in Helson 1964) and, indeed, Helson's concept of adaptation level has provided the foundation for much of the marketing research that investigates effects of reference points (e.g., Della Bitta and Monroe 1974, Puto 1987).

While adaptation level theory is thoroughly articulated in Helson (1964), there are two concepts that are particularly relevant to the effects of reference point adaptation on price-quality tradeoffs. Each is briefly described below.

First, the order in which a series of stimuli is encountered affects the final reference point because the first stimulus in a series is weighted more heavily and acts as an anchor to reference point adaptation and, subsequently, to judgments of stimuli (Helson 1964).

This anchoring effect of initial stimuli has been demonstrated in studies of decision making and judgment (Switzer and Sniezak 1991, Carlson 1990, Hogarth and Einhorn 1992, Della Bitta and Monroe 1974). The order in which a decision maker is exposed to alternatives can change which alternative serves as an anchor to reference point adaptation, thus affecting both interim and final reference points and how the individual alternatives in the series are evaluated. Thus, in the context of price-quality tradeoffs, order may determine how the price and quality of a particular alternative are evaluated and whether or not it is chosen for purchase.

Second, Helson (1964) shows that the distance of a stimulus from the reference point affects the amount of adaptation. The more discrepant or intense the stimulus is, the greater the amount of reference point adaptation to the stimulus. This implies that a buyer's reference points for price and quality will adapt the most when the levels of price and quality in evaluated alternatives are very different from the buyer's initial reference points.

A reference point for a product purchase is a standard to which alternatives are compared. The source of this standard may differ depending upon the individual, situation, and/or the goal. Klein and Oglethorpe (1987) suggest that in a choice task the reference point could be the expected product, the typical product, the product last purchased, the desired product, or the ideal product. The reference point could also be either an existing product or hypothetical product. Regardless of which form of reference point the consumer uses, products being evaluated will be compared to it.

For the purposes of this research, reference points are operationally defined as the attribute levels that a consumer expects to achieve from the purchased product. They may be developed from both internal sources such as aspiration levels or expectations and external sources such as advertised values, average attribute values in the market, and the values of specific alternatives. This reference point construct is similar to that of expectations which has been operationalized several different ways in the consumer behavior literature. Meyer (1982) defined expectations as the average value of an attribute in the market. Duncan and Olshavsky (1982) viewed expectations as beliefs about the market. In the satisfaction literature expectations are generally defined as the standard of performance by which a product is judged (Oliver 1980). Regardless of the operationalization, expectations have been found to affect the type of information processing (Sujan, Bettman, and Sujan 1986), the amount of search (Meyer 1982, Duncan and Olshavsky 1982), and the level of satisfaction (Oliver 1980).

The definition of reference point used in this dissertation corresponds most closely to that used in the satisfaction literature (e.g., Oliver 1980, Churchill and Surprenant 1982). It differs from an economic definition of reference point as the average level or expected value of the attribute in the product-market (Meyer 1982), because what a consumer expects to buy may be at least partially based on internal needs or aspirations, as well as what is available. Furthermore, if the consumer has little knowledge about the product-market, s/he may not have an accurate perception of what the average value of an attribute is in the market but may nonetheless use this unrealistic reference point to compare alternatives.

It is also likely that consumers use more than one reference point when evaluating products for choice. Multiple reference points have better explanatory power in choice models than single reference points (Putler 1992, Mayhew and Winer 1992, Hardie, Johnson, and Fader 1993). Furthermore, Corfman (1991) shows that consumers use multiple reference points when comparing products or making a choice. The current research uses the adaptation of two reference points, price and quality, to explain the effects of context on evaluation, price-quality choice, and choice outcomes. The price reference point is the amount that the buyer expects to pay for the purchase. The quality reference point is the expected overall quality provided by a specified set of attributes that s/he will achieve in the purchase.

Studies investigating the consumer's perception of product value support the idea that consumers have reference points for both overall quality and price. Monroe and Chapman (1987) proposed a model of perceived value which separates value into perceived quality and perceived price. They suggested that both the price-perceived quality conceptualization of value and Thaler's (1985) mental accounting concept indicate that consumers make cognitive tradeoffs between quality and sacrifice (price). Zeithaml's (1988) model of perceived value incorporates extrinsic and intrinsic cues at varying levels of abstraction for both sacrifice and quality. Her exploratory study of the concept of value resulted in a definition that includes the consumer's perceptions of what is received and what is given; i.e., quality and price.

This definition closely resembles that of Monroe and Chapman (1987) and Thaler (1985), and indicates that consumers assess both the quality of a product and what they

must pay for that quality. When a product is being evaluated on both quality and price, that evaluation is likely to be made using a quality reference point to determine its attractiveness with regard to product attributes and a price reference point to determine its attractiveness with regard to sacrifice. Other studies provide further empirical evidence that consumers readily compare price and quality (Rao and Monroe 1989, Lichtenstein and Burton 1989, Simonson 1989, Simonson and Tversky 1992).

It makes intuitive sense that consumers use price as a comparison standard; it is a product attribute that is readily available for evaluation and is typically easy to compare across products. Internal reference prices, generally operationalized as expected prices, account for significant variance in choice models and are commonly used by consumers to evaluate products (Thaler 1985, Monroe and Chapman 1987, Kalwani, Yim, Rinne, Sugita 1990, Lattin and Bucklin 1989, Zeithaml and Graham 1987, Winer 1986, Jacobson and Obermiller 1990). When consumers use reference points to judge the quality of products, those reference points can be defined on several levels of abstraction. On a concrete level, quality reference points may be formed for each product attribute. Products would be evaluated by comparing each attribute value to an expected or desired level for that attribute. An abstract, overall estimation of product quality based on a summary evaluation of individual attribute comparisons might also be used as a reference point. A more abstract quality reference point reduces the cognitive effort required to compare products and may be more efficient at certain points in the choice process. In fact, Corfman (1991) found that subjects frequently used greater levels of abstraction than



necessary for product comparisons and suggested that abstract comparisons were easier to make when consumers were familiar with the product.

When an evaluation task is undertaken as part of a more complex decision process, such as sequential choice, it may be more likely that consumers use relatively abstract quality reference points in an effort to reduce cognitive effort. The cognitive effort required to execute each attribute level comparison for every product would be quite high, and studies show that consumers avoid cognitive effort even at the risk of making a suboptimal choice (Wright 1975, Johnson and Payne 1985, Lanzetta and Kanareff 1962). However, there is empirical evidence that decision makers can recall specific product attribute values even when they are asked to make global product evaluations (Park and Hastak 1994, Park and Wyer 1994, Unnava, Burnkrant, Erevelles 1994). Therefore, in this research, reference point expectations are measured for multiple quality attributes, but these are combined to form a summary quality reference point.

This section has defined the construct of reference points and discussed the nature of adaptation of reference points. It suggested that consumers use multiple reference points when evaluating products for choice and supported the selection of price and quality as two reference points consumers would use when making purchase decisions. The following sections of this chapter will present the research hypotheses for the two independent variables. The hypothesized effects are based upon the concept of reference point adaptation.

## **Research Hypotheses**

The specific effects of order and outliers on price-quality tradeoffs and choice outcomes that are investigated in this study are limited to those which are of substantive interest in the marketplace. Four sets of hypotheses are tested in markets where the buyer has relatively accurate expectations of the kinds of price-quality tradeoffs that are available in the market. The first set predicts effects of order of presentation on evaluation, length of search, and price-quality choice. The second set of hypotheses predicts effects of outliers on evaluation, price-quality choice, and relationship quality. In this second set, predictions are made only for higher priced, higher quality outlying alternatives because these are of substantive interest to sellers. Sellers are seldom motivated to present alternatives that are lower in both price and quality than what the buyer initially expects.

The third set of hypotheses are null hypotheses for effects of order and outliers on satisfaction with choice. Null hypotheses are proposed because while the effects are of substantive interest, it is not possible to predict the direction of this complex phenomenon. Previous research has not specified whether the discrepancy model of satisfaction is based upon initial or adapted (final) expectations. However, it is of substantive interest to determine whether order and outliers affect satisfaction and, if they do, what those effects are. The final set of hypotheses predicts the mediating effect of final reference points. Mediation is tested for the relationship between the independent variables of order and outliers and the dependent variables of evaluation, choice, and search length.

### *Effects of Order Of Presentation*

As previously discussed, alternatives encountered early in the evaluation process anchor reference points for subsequent evaluations. Thus, the effect of presentation order is important in understanding buyers' price-quality tradeoffs. There are two types of order effects that may affect the perceptions of price-quality tradeoffs and the purchase process. The first is whether initial stimuli or the most recent stimuli are weighted more heavily in the final judgment, commonly referred to as primacy/recency effects (Hovland 1957). Stimuli that are given more weight act like anchors for reference points and will thus have more effect on evaluations of other alternatives and, subsequently, choice. A second order effect obtains from trends in the levels of attributes of the stimuli. Trends that positively reinforce search behavior are likely to result in longer search. The proposed effects of primacy and/or recency on evaluation and choice are discussed first.

Figure 3 shows alternatives in a market where buyers have relatively accurate expectations regarding the price-quality relationship. The alternatives are shown in relation to both the quality reference point and the price reference point. The horizontal axis indicates the chronological order in which the alternatives are presented. The left vertical axis represents increasing levels of quality; the right vertical axis represents increasing levels of price. The thick horizontal line through the series of five alternatives shows the level of the quality reference point and price reference point of the buyer. Alternatives above this line have somewhat better quality and higher prices than the buyer's reference points, alternatives below the line have somewhat lower quality and price than the buyer's reference points, but all five alternatives are within the buyer's expected

range for both price and quality. Alternatives presented in an ascending order of quality are shown by a + circle, those presented in a descending order of quality are shown by a - circle.

Adaptation level theory explains how a buyer's final reference point might be affected by order of presentation. According to the theory, the first stimulus in a series is weighted more heavily than the others (a primacy effect) and anchors the final adaptation level so that it is lower than the actual arithmetic mean of an ascending series and higher than the actual arithmetic mean of a descending series. Helson (1964) and Della Bitta and Monroe (1974) both found primacy effects in tasks where subjects estimated the values of stimuli. The first stimulus value anchored the estimation so that it did not sufficiently adjust to the values of the remaining stimuli in the series. These studies, however, used stimuli for which the subjects did not have a preexisting reference point.

Primacy effects are also found in studies investigating anchoring and adjustment behaviors and occur even when the first encountered information is irrelevant (Carlson 1990, Switzer and Snieszak 1991, Wright and Anderson 1989). Primacy effects also occur in impression formation tasks (Luchins, in Hovland 1957) and categorization tasks (Higgins and Lurie 1983).

It would seem likely, then, that for a given set of alternatives, the first evaluated alternative will have a disproportionate effect on the final reference point. This implies that the final reference points for quality and price will be lower for sets presented in ascending order of quality and price than for sets presented in descending order. When a

set of alternatives is presented in order of increasing quality and price, the first evaluated alternative has the lowest price and lowest quality of the set. If it anchors the reference points, then the final quality and price reference points will be relatively low. In a set with descending order of quality and price, the first evaluated alternative has the highest levels of price and quality of the set. If it is more heavily weighted, then the final price and quality reference points should be relatively high.

The difference in reference point level for ascending and descending series of alternatives is expected to affect the buyer's search outcome in several ways, as shown in Figure 1. First, preferences are a function of the evaluation of an alternative in relation to a reference point (Tversky and Kahneman 1991). Therefore, the evaluation of any one alternative in a set should change as a result of shifts in the reference point and there is substantial empirical evidence that this does indeed occur (e.g., Tversky and Kahneman 1991, Payne, Laughhunn, and Crum 1980 1981, Puto 1987).

Tversky and Kahneman (1991) present evidence that shifting a reference point changes the evaluation of an alternative as a loss or a gain, and, subsequently, affects preferences and choice. Payne, Laughhunn, and Crum (1980, 1981) investigated preferences among sets of gambles and found that changing the aspiration level, or reference point, by adding or subtracting a constant amount to gamble payoffs changed preferences for the gambles even though the expected value of all gamble sets was equal. The explanation was that shifting the reference point also changed the perceived value of the gamble and, therefore, preference for the gamble in the set.

Translating these findings into a product choice context, shifts in the reference point will change preferences for product alternatives. The evaluation of an alternative with a given level of quality will be more favorable when the reference point for quality is low than when the reference point for quality is high. Thus, evaluations of successive alternatives should be higher when they are presented in an ascending order of quality as opposed to a descending order. This prediction is complicated by the negative correlation of price and quality. A high level of quality compared to a reference point is also a high level of price, and higher prices are generally less attractive to consumers. However, Simonson and Tversky (1992) have shown that high prices are less aversive than low quality, so it is expected that the quality reference point will influence evaluations such that:

H1a: Alternatives will be more favorably evaluated when presented in an ascending order of price and quality than in a descending order.

A second effect of order of presentation relates to the buyer's search length. In a sequential search task, consumers may compare the potential benefits of finding a "better" product (e.g., one that meets or exceeds their price-quality expectations) with additional search against the costs of conducting that search. In fact, the cost-benefit framework is frequently used to model search behavior (Ratchford 1982, Hauser and Wernerfelt 1990, Roberts and Lattin 1991, Meyer 1982, Phipps and Meyer 1984).

A descriptive model of search proposed by Meyer (Meyer 1982, Phipps and Meyer 1984) explicitly includes a reference point and allows that reference point to adapt to information collected during search. He defines the reference point as the riskless value of

an attribute, determined by a weighted average of the attribute values across all products familiar to the consumer. As the consumer examines additional products this reference point is updated.

Phipps and Meyer (1984) used Meyer's (1982) model to examine the extent of search for apartments. That descriptive model of search allows a consumer to update his/her expected values of attribute distribution and variance through search and then use these updated expectations to decide when to stop searching. The model predicts that higher initial expectations will result in longer search because consumers have less probability of finding a product that matches their expectations. Phipps and Meyer (1984) compared this descriptive model with other normative search models that lacked adaptive reference points and found that the descriptive search model had better predictive ability for search behavior than the normative models. Thus the concept of reference points can help explain the length of search.

Hauser and Wernerfelt (1990) and Roberts and Lattin (1991) present similar economic models to predict the size and composition of consideration sets. These models are relevant to search length because in sequential search processes, increasing the size of the consideration set is equivalent to continuing search. Both models include the expected utility of a product and consideration costs as variables that affect length of search.

Hauser and Wernerfelt's (1990) predictions of consideration set size using aggregate data compare favorably to findings of consideration set sizes for a variety of goods in other descriptive research. A product is added to the consideration set if its expected utility exceeds that of the product with maximum utility in the set, and if the difference in

decision costs of the set with and without the product does not exceed the utility difference.

Roberts and Lattin's (1991) model using individual data to predict consideration set composition and size was supported with data for cereal preferences. Consideration set size is determined by product utilities such that the product will be included if its marginal utility exceeds the marginal costs of consideration.

In both of these models, the maximum product utility of a product in the consideration set is used as a reference point to evaluate potential additions to that set, and thus the role of an adapting reference point is implicit in both models. As products with higher utility are added to the consideration set, the standard of comparison increases. As this reference point increases, there is less likelihood that search will continue because the probability of finding products with greater utility decreases. Therefore, higher adapted reference points should result in less search.

While these economic models do not consider any anchoring effects or incomplete reference point adaptation, they do show that reference point adaptation influences search length. These three economic models of sequential search predict that higher initial reference points may prolong search because the probability of finding an alternative that meets or exceeds the reference point is low. However, once a product with a high level of quality is in the consideration set, search is likely to stop because there is less probability that marginal gains will be greater than marginal search costs. This suggests that consumers who first encounter high quality alternatives will search less than those who first encounter low quality alternatives. Therefore, when alternatives are presented in



descending order of quality, search should be shorter than when alternatives are presented in ascending order of quality.

However, an increasing trend in quality is also an increasing trend of price.

Because high price appears less aversive than low quality (Simonson and Tversky 1992), the quality reference point is expected to influence search length such that:

H1b: Search length will be longer for an ascending series of price and quality than for a descending series.

There is empirical evidence that reference points affect choice. Puto, Patton, and King (1985) conceptualized reference point as a decision frame and presented industrial buyers with a scenario for a modified buy task in which they could either use a single vendor or split the procurement. After the choice task, buyers were asked to report which of six reference points best represented how they saw the problem. The reference point used by the buyer had a significant effect upon the choice to either split the procurement or use a single source. For example, buyers who used the historical performance level or the guaranteed performance level as reference points were more likely to use a single vendor while those who used the worse case scenario or the expected value as reference points were more likely to split the procurement.

Puto (1987) found that in an industrial buying situation, an initial reference price for a purchase task adapted to buying objectives (budget) and expectations about future prices (price trend). The final adapted reference price had a significant mediating effect on the purchase choice. Buyers with easy to attain final reference points tended to choose the

riskless supplier while those with hard to attain reference points tended to choose the risky supplier (50-50 chance of either paying less or not getting supplies).

In a study using a consumer product (VCR), Rowe and Puto (1987) measured the final reference price by having subjects pick the comparison price they were using from a list after a choice was made. They found that the final reference point was a reasonable predictor of choice. These three studies together indicate that changes in the reference point do affect choice.

Adaptation level theory predicts primacy effects for sequential evaluation of alternatives so that the reference point for a series presented in ascending order will be lower than that when the series is presented in descending order. If the consumer chooses an alternative that meets or exceeds his/her reference points, then the choice made from a set of alternatives presented in ascending order of quality will have lower quality and price than that of the same set presented in descending order.

H1c: Choice will be of lower price and quality in an ascending series than in a descending series.

### *Effects of Outlying Alternatives*

Sometimes, a search may include an 'outlier,' defined as an alternative that has attribute values that are outside the range that the buyer was expecting to achieve with the purchase. If reference points adapt to external stimuli, then salespeople may be able to influence the buyer's choice within a range of alternatives by presenting outlying

alternatives. Thus, it is relevant to examine the effect of outliers on reference point adaptation.

The following set of hypotheses predict the effects of presenting stimuli that are outside the range of the buyer's price and quality reference points on the variables of evaluation, price-quality choice, and the buyer's perceptions of the salesperson. No predictions are made for outlier effects on search length because, in this design, adding an outlier to the choice set increased the number of available alternatives to search. Thus, any increases in search length for outliers could be attributed to the larger number of available alternatives. Furthermore, the effects of more substantive interest are those on evaluation, choice, buyer-seller relationship, (Hypotheses 2:a-c) and satisfaction (Hypothesis 3b).

Figure 4 is a graphical representation of those choice situations in which a buyer has relatively accurate expectations of the price-quality relationship in the market, but encounters alternatives outside his/her reference point ranges. The moderate outlier has somewhat higher levels of price and quality than the buyer expects and the extreme outlier has extremely higher levels of price and quality than the buyer expects. The outliers are evaluated first in a descending trend of quality and last in an ascending trend of quality.

Adaptation level theory states that a reference point adapts towards all stimuli within the class for that reference point and that the greater the distance between the reference point and the stimulus, the greater the amount of adaptation (Helson 1964). Empirical support for this prediction in the pricing literature is provided by Blair and Landon (1981), Urbany, Bearden, and Weilbaker (1988), Biswas and Blair (1991), and

Biswas, Wilson, and Licata (1993). Generally, these studies find that external, or market-supplied, prices affect consumer's internal reference points for price and influence perceptions of savings and price estimates. Furthermore, the magnitude of the effect is a positive function of the discrepancy between external prices and the consumer's internal reference price (Biswas and Blair 1991). Therefore, it is expected that exposure to an alternative with both higher price and higher quality will cause the buyer's price and quality reference points to shift up as long as the outlier is perceived to be relevant to the choice, that is, it is only moderately discrepant from expectations. In line with earlier arguments, this upward shift in reference points should also affect both the evaluation of a specific alternative and the final choice. Therefore, it is predicted that:

- H2a: Evaluation of a specific alternative will be lower when a moderately higher outlier is included in the choice set than when it is not.
- H2b: Choice will be of higher price and quality when a moderately high price-quality outlier is included in the choice set than when it is not.

Helson (1964) argues that there is a limit to the outlier effect. He stated that stimuli outside the class for a reference point have no effect on adaptation of that reference point. Similarly, Kahneman (1992) notes that anchoring effects depend upon the "categorization of the anchor as a member of the set of relevant stimuli, " (p. 309). Therefore, if a stimulus is so extreme that it is outside the category of relevant purchase alternatives, it should have no effect on reference points and choice.

There is some evidence that even very discrepant stimuli have effects on reference points. Biswas and Blair (1991) found that implausible sale prices affected consumer's perceptions of savings and Urbany, Bearden, and Weilbaker (1988) found that exaggerated prices affected consumer's price estimates and purchase behavior. Biswas, Wilson, and Licata (1993) concluded that these effects occurred because neither the implausible nor the exaggerated price was 'outlandish.' In Helson's terms, these reference prices were not sufficiently extreme to be perceived as 'outside the class' of stimuli. Thus, one difficult issue is how extreme a stimulus must be to have no effect on reference point adaptation.

Knowledge of how people categorize objects may help determine if an outlier alternative is perceived as a member of the category of relevant purchase alternatives. Mervis and Rosch (1981) suggest that both features and dimensions are used to determine categories. Features are separable and distinctly identifiable from each other and the object. For example, a garage and a bedroom are two features that a house may possess. Dimensions are integral to the object and generally measured on a continuous scale. For example, size and age are dimensions of a house. Category members vary with respect to how typical they are of the category; objects are more probable members of a category if their features and dimensions are similar to the prototype values for that category (Barsalou 1985), or to an exemplar of the category.

Categories possess graded structure; some categories contain members that are very similar to each other while other categories contain members that are not very similar to each other (Barsalou 1985). Roth and Shoben (1983) and Barsalou (1985) found that

context changes the graded structure of categories. This implies that even though a wide variety of residential structures are categorized as homes, in the context of a specific home purchase, many of those structures would not be members of the relevant category. For example, a home buyer's category for his/her current purchase may be 3-bedroom, 2-bath houses priced between \$100,000 and \$120,000. A \$500,000 home that has 5 bedrooms, 4 bathrooms, 2 Jacuzzis, and separate housekeeper's quarters may not be classified as a member of that category. Although it possesses many of the same features as the buyer's target category (bedrooms, baths, appliances, heating systems, price etc.), its dimensions and other features are very atypical of the buyer's category for the current purchase. If the latter house is perceived as being in a different category, exposure to it should have no effect on the buyer's reference points for price or quality. Therefore, alternatives that have very extreme levels of price and quality in relation to the buyer's reference points should not be categorized as relevant for the purchase and should not cause adaptation of those reference points.

Based on categorization theory and adaptation level theory, it is predicted that alternatives with extremely high levels of quality and price compared to the buyer's reference points will not cause adaptation of those reference points. Following previous arguments that changes in reference points influence choice, if extreme outliers have no effect on price and quality reference points, then it is reasonable to assume that they also will not influence the price-quality evaluation or choice. Therefore, it is predicted that:

**H2c:** The evaluation of a specific alternative will not be affected when an extremely high price-quality outlier is included in the choice set.

**H2d: The choice from a set of alternatives will be not affected when an extremely high price-quality outlier is included in the choice set.**

The previous discussion and four hypotheses argue that outliers have effects on reference point adaptation and, subsequently, on alternative evaluation and price-quality choice. However, there may be other choice outcome effects that result from the presentation of outliers that are of significant managerial importance to sellers, but not a function of reference point adaptation. One of these is buyer-seller relationship quality. It is possible that the presentation of outliers, whether or not it affects evaluation or choice, may influence the buyer's perception of the salesperson. Marketers would be interested in these effects because the buyer's perceptions of the salesperson may affect whether the buyer makes repeat purchases from the same firm and/or whether they recommend the firm/salesperson to others.

A salesperson may have justifiable reasons for showing alternatives that differ from the buyer's expectations. In some cases, a salesperson may show higher price, higher quality alternatives if s/he thinks that doing so will help the buyer to be more satisfied with the choice process and outcome. The salesperson might also want to educate a buyer about the range of product attributes available in the market or determine whether the buyer's needs would be better met by a product different from what the buyer perceives s/he wants.

People often make causal inferences about events and others' behaviors (Alba and Hutchinson 1987, Crocker 1981, Folkes 1988, Kelley 1973). When a salesperson presents an alternative that is discrepant from the buyer's expected range of price and quality, the

buyer may make inferences about the salesperson's motivation for doing so. Those inferences could reflect positively or negatively on the salesperson. For example, a buyer might infer that a salesperson is trying to help with decision making or that the salesperson is just trying to earn a higher commission by selling something the buyer can barely afford.

When presenting an alternative that is discrepant to the buyer's specifications, a salesperson is likely to explain why the buyer should consider that alternative. However, as that discrepancy increases, any explanation may become less plausible, increasing the likelihood that the buyer will make negative inferences about the salesperson's motivation. Therefore, it is predicted that presenting an extreme outlier to a buyer will result in the buyer having less positive perceptions of the salesperson.

H2e: Buyers' perceptions of the buyer-seller relationship quality will be lower when extreme outliers are presented than when moderate outliers or no outliers are presented.

### *Satisfaction with Choice*

Early models of satisfaction modeled it as the discrepancy between expectations and performance (Oliver 1982). However, more recent models have found that an absolute performance component is also a significant predictor of satisfaction (Halstead, Hartman, and Schmidt 1994, Oliver 1993). If product performance is the primary influence on satisfaction, then people should be more satisfied with better price/quality choices and order and outliers should not directly affect satisfaction. Also, if discrepancy between expectations and performance influences satisfaction and reference points completely adapt to the price/quality levels of evaluated alternatives, then satisfaction



should not be affected by presentation order or presentation of outliers. However, as Helson (1964) notes, the anchoring effect of the current adaptation level may preclude complete adaptation to new stimuli. When order and outliers affect reference point adaptation, it is possible that adapted expectation levels for price and quality may not match the levels of price and quality in the evaluated alternatives. Incomplete adaptation could then influence satisfaction levels. Because salespeople would most likely prefer that their customers be satisfied with their choices, it is of substantive interest whether order and outliers affect satisfaction levels. However, there is no *a priori* reason to predict specific directional effects for the independent variables of order and outliers. Order and outlier effects are predicted to move the final reference points and choice in the same direction, e.g., if you have a higher final reference point you choose a higher price-quality alternative. Satisfaction, then, if influenced by a comparison between the final reference point and choice, will not necessarily be affected by order and outliers. Therefore, the effect of order and outliers, if any, are of substantive interest but unpredictable and the null hypotheses are presented.

H3a: Order of presentation of alternatives will not affect a buyer's satisfaction with his/her choice.

H3b: Presenting outlier alternatives will not affect a buyer's satisfaction with his/her choice.

### *Mediating Role of Final Reference Points*

The preceding predictions of order and outlier effects on evaluation, choice, and search length have been predicated upon the theoretical explanation of reference point

adaptation and the relative position of the final reference point. It is possible that these effects will occur as predicted but that some other theoretical construct mediates that relationship. Therefore, the following two hypotheses are presented to directly test the mediating relationship of final reference points for order and outlier effects on evaluation, choice, and search length.

H4a: Final reference points mediate the relationship between order of presentation and evaluation of alternatives, price/quality choice, and search length.

H4b: Final reference points mediate the relationship between presentation of outlier alternatives and evaluation of alternatives and price/quality choice.

This chapter contains the discussion of the constructs of price-quality tradeoffs and reference points and the presentation of hypotheses that predict how order of presentation and presentation of outlying stimuli affect the evaluation of alternatives, price-quality choice, and length of sequential search. Hypotheses were also presented for the mediating role of final reference points in these relationships. Several hypotheses were also developed for the effects of outliers on the buyer's perceptions of the salesperson and order and outlier effects on satisfaction with choice because those are managerial relevant issues to marketers. The research hypotheses are summarized in Table 1. The next chapter of the dissertation describes the methodology that tested these hypotheses.

## **CHAPTER 3 METHODOLOGY**

This chapter contains the methodology that tested the hypotheses developed in the preceding chapter. First, I discuss the research design, domain, and subjects. Then I describe the research procedure and the computer task that was used to measure reference points and present the choice sets. Next, the stimulus materials are described and, lastly, the operationalizations of variables are presented.

### **Design**

The research hypotheses were tested in a controlled field setting that used the design shown in Figure 5. The design tests for effects of three conditions of order; ascending, descending, non-monotonic. While hypotheses were not developed for non-monotonic order, it is of substantive interest because realtors often show houses in some efficient geographic order that may result in no specific order of price and quality. It is important, therefore, that any effects of order be compared to what may occur in some non-monotonic or random order of presentation.

The design also tests for effects of three conditions of outlying alternatives; no outlier, a moderate outlier, and an extreme outlier. However, outlier conditions are only tested for ascending and descending orders, resulting in an incomplete factorial design of seven cells. The incomplete design was selected based upon practical concerns of obtaining sufficient subjects and substantive issues of primary interest to realtors. For example, realtors may find it easier to justify showing a high priced/high quality outlier at

the beginning of a descending series or at the end of an ascending series by explaining that the outlier shows the boundaries of the buyer's price/quality specifications. This may be harder to justify when the outlier appears unexpectedly in the middle of a mixed order of price/quality alternatives.

Order of presentation and presentation of outlying alternatives are categorical variables. The effects of varying levels of these two factors on the dependent variables of search length, price-quality choice, evaluation of alternatives, satisfaction with choice, and buyer's perceptions of the buyer-seller relationship and on the mediating variable of final reference points were evaluated. With the exception of choice, the dependent variables are continuous, although search length is restricted to integer values between 1 and 6, the maximum available alternatives in choice sets with outlying alternatives. Choice is an ordinal variable describing the position of the chosen alternative in the sequence of alternatives ordered from low to high price and quality. Thus, a choice labeled '1' is the lowest price-quality alternative.

### **Domain**

The domain for investigating the research hypotheses is the purchase of a single family home by an individual buyer. This purchase situation is particularly well-suited to this study because it exhibits several important characteristics. First, consumers have price-quality expectations and sequentially search alternatives. Furthermore, to a large extent, the salesperson controls the order in which the consumer evaluates the alternatives. Finally, it is a buying situation where reference points could be expected to adapt to the

alternatives being presented because buyers are generally not so certain of their expectations that they reject any discrepant alternative.

Interviews with realtors indicated that home buyers have expectations about the kind of attributes their new home should have and about how much they will pay for the home. These purchase expectations are often expressed as the conjunction of two reference points, one for the bundle of attributes and another for price (e.g., a three-bedroom, two bath home with a yard and appliances less than 10 years old for \$90,000-\$100,000). This characterization supports the assumption that price-quality tradeoffs are relevant.

Sequential search occurs in real estate markets because the alternatives are spatially separated and personally visited. The buyer must travel from one prospective home to the next and, therefore, experiences a sequential presentation during an important part of the choice process. Salespeople generally control the order in which buyers evaluate houses in this sequential search process. In fact, interviews with real estate agents indicate that they often employ particular strategies with respect to the order in which they show houses.

The real estate industry also exhibits a wide variability of available quality and prices across local markets so that price-quality expectations developed in one market may not be accurate in an unfamiliar market. For example, a buyer moving from New York City to Blacksburg, VA may find that the homes in this rural market have much better attributes and much lower prices than s/he expected. Realizing this potential for such variability, buyers may be more ready to adapt to the current market. Thus, the real estate

market is particularly well-suited for investigating the effects of order of presentation and presentation of outlier alternatives on reference point adaptation, choice processes, and price-quality choice outcomes.

## **Subjects**

The design has a total of 7 cells. A minimum of 15 subjects per cell was estimated appropriate to achieve minimal power requirements of .60 in ANOVA F-tests, requiring a total of 105 subjects. The planned method for obtaining subjects was to use the assistance of five real estate brokers in a rural university community (pop. about 35,000) who agreed to recruit their clients for participation in the study. As an incentive for participation by home buyers, the chance to win one of two \$500.00 lottery prizes was offered to study participants. To encourage recruitment of clients by agents, \$500.00 prizes were also offered to the agents who recruited the winning subjects. However, this method yielded only nine subjects. In retrospect, it appears that although the realtors initially interviewed were enthusiastic about the project, in the field these and other realtors were reluctant to devote valuable client time to complete the research instrument.

The data from these nine subjects were therefore added to that of 20 other pretest subjects, consisting of graduate students, faculty, and staff. These 29 subjects were used as a final pretest prior to a second method of data collection.

The final sample was recruited through classified advertisements in four newspapers in the northern Illinois area (Rockford Register-Star, Aurora Beacon News, DeKalb Chronicle, and the Northern Today) and flyers distributed to two realtor offices in

DeKalb, IL and Genoa, IL. The specific origin of the 137 subjects is shown in Table 2. Subjects are distributed relatively equally across the sources except for flyers, which were not a particularly effective recruiting technique. The final sample subjects were paid \$25.00 each for participation.

Each potential subject contact, whether solicited through participating realtors or classified ads, was screened to ensure s/he was in the process of buying a single family home. If the purchase was being done by a couple, data were collected individually from each member if the spouse or significant other also agreed to participate. There were 40 couples who participated in the study, representing 64% of the sample. All respondents were randomly assigned to one of the seven experimental conditions and no individuals who participated as couples were both assigned to the same condition.

Gathering data from both individuals of a couple may introduce particular problems for the research. It could potentially reduce variance in the data because the two members of a couple may have similar reference points and preferences. Individuals may also be influenced by what they expect their partner to prefer. These factors, however, work against confirmation of the hypotheses because partners responding similarly in different conditions would reduce between cell variance. Furthermore, research indicates that preference similarity between couples may not be a serious problem for this study. Park (1982) found that husbands and wives did not have significantly similar decisions strategies when purchasing homes and that spousal agreement was lower on subjective dimensions (e.g., interior design, appearance) than objective dimensions (e.g., number of bedrooms, garage). Because subjective dimensions were varied in the experimental stimuli

the likelihood of reference point variance was greater. Curry and Menasco (1979) modeled joint decisions and found that in the initial phases of a decision a couple may have high levels of agreement, but in the final selection phase there were significant levels of disagreement. Thus, inclusion of both members of a couple poses no obvious threat to the validity of experimental results.

Spousal similarity was analyzed by comparing partners' choice, evaluation of the alternative if both chose the same one, initial price and quality reference points, and the number of differences in expectations for nine objective attributes. All analyses indicated that there was sufficient variance between members of a couple. Less than half of the couples (15 of 40, 38%) chose the same alternative. For those 15 couples, partners' evaluation of the chosen alternative were significantly different (paired t-test: Mean difference rating = 19.7,  $t_{df=14} = 5.36$ ,  $p < .001$ ). Spouses' initial reference points for price and quality were also compared, both were significantly different (paired t-tests: Price Reference Point mean difference = \$19,345,  $t_{df=39} = 5.18$ ,  $p < .001$ ; Quality Reference Point mean difference = 23.68,  $t_{df=29} = 6.86$ ,  $p < .001$ ). Out of a possible 360 comparisons (9 objective attributes, 40 couples), there were 94 differences in spousal expectations (26%). The nine attributes included number of bedrooms and bathrooms, type of garage and basement, condition of house, and specifications of heating, cooling, water, and sewer systems. With this much difference in expectations between important, objective attributes, spousal similarity in this study does not appear to be overly high. The results of these four spousal similarity analyses indicate that using both members of a couple did not significantly reduce variance in the dependent variables.



There were several significant benefits from using both members of a couple. First, it facilitated data collection. People may have been more willing to participate in the study when both individuals could perform the computer task and increase the potential reward. In addition, data from couples may be used in future research. These practical benefits, along with previous findings that couple's preferences are often dissimilar, support using both individuals of couples who agree to participate.

Using subjects who are actual home buyers to investigate price-quality tradeoffs in choice for new homes provides a high level of ecological validity to the research. The sample is not representative of all home buyers because subjects are drawn from only restricted geographical areas. However, there is no *a priori* reason to believe that buyers in the sampled areas systematically differ from other buyers in terms of search processes or reference point adaptation.

### **Cell Sizes**

The researcher controlled the assignment of subjects to conditions in a manner that resulted in approximately equal cell sizes. The data were collected on computer disks, each of which contained one of the 7 experimental conditions. Generally, these disks were distributed to subjects by cycling through the different cells. However, more disks for ascending outlier conditions were distributed than for other cells in an effort to obtain a sufficient number of subjects who were assigned to an outlier condition and actually evaluated an outlier. Because subjects can stop and choose a home at any point in the choice task, some subjects assigned to an ascending outlier condition never search long

enough to see the outlier, resulting in an ascending, non-outlier condition rather than the condition to which they were assigned. This happened with about half of the subjects assigned to outlier conditions. The exact distribution of subjects across experimental cells is reported in Table 3, which shows the number of subjects originally assigned to each condition, the number of subjects in outlier conditions that were actually experienced, and the number in each cell if subjects who didn't search long enough to see an outlier are dropped from the analysis.

### **Research Procedure**

After establishing a potential subject's eligibility, the study was briefly described as investigating: (1) how people evaluate and select homes for purchase, and (2) whether computer aids may assist in the buying process. The potential subjects were told that the results of the study were expected to help understand the decision processes people use when making important purchases. Subjects were told the task would take about 30-40 minutes, participation was completely voluntary, and subjects' anonymity would be protected.

When a buyer agreed to participate, s/he was sent a package containing the diskette with the questionnaire, instructions, an Informed Consent Form, the \$25.00 payment, and a prepaid mailer to return the diskette. The task involved making a choice of a home in a hypothetical market. Ethical considerations precluded presenting false information about the buyer's actual real estate market. In addition, a hypothetical market enhanced the required manipulation because it reduced across subjects variance in level of

knowledge about the real estate attributes and prices in the market. It thus strengthened the impact of the presented stimuli on reference point adaptation. In addition, there was less likelihood of affecting subjects' actual expectations for their impending home purchase. After the choice task, the questionnaire debriefed the subjects to ensure that they understood that the stimuli in the task were completely fictional and had no relation to the homes available in the actual market where they were buying a home.

### *Computer Survey*

A computer-interactive survey was created with Ci3 software for marketing research (Sawtooth Software, 1992). This survey task consisted of five parts; introduction of the hypothetical purchase situation and real estate agent, measurement of initial reference points, the choice task, measurement of final reference points, and, finally, measurement of perceptual and demographic variables. Each part is described in more detail below.

#### Introduction

The first part asked subjects to imagine they were being relocated to a rural university town in Ohio with a county area population of 75,000. As previously discussed, a hypothetical market was chosen to strengthen the manipulation and for ethical considerations. However, it is desirable that the hypothetical market be somewhat similar to the subject's current market to most closely match the buyer's decision process. Locations that might evoke strongly discrepant images of the actual real estate market and/or community were eliminated. Northeastern urban locations and rural Southern

locations, for example, were not considered appropriate because housing markets may be perceived as crowded and expensive or rural and inexpensive, respectively. Therefore, a rural university town in Ohio was selected for the hypothetical market. The population size of the hypothetical market is consistent with that of the general geographic area from which the sample originated.

Subjects were then introduced to the simulated computer agent who asked them for some general information, including family income, family size, types of activities enjoyed, and the maximum amount s/he could pay for a house. This kind of general buyer information is routinely requested by realtors in an effort to assist the realtor in understanding the buyer's purchase parameters and core needs. Thus, collecting this information enhances the ecological validity of the computer task.

#### Initial Reference Point Measurement

The second part of the survey measured the subject's initial price and quality reference points for the hypothetical real estate market in Ohio which generally matched the sample's current market. First, it asked for the subject's initial expectations about getting 24 real estate attributes (shown in Appendix A) in her/his new home and then asked how certain s/he was about getting each one. The 24 attributes consisted of 23 quality attributes and price. For quality attributes with several levels (e.g., bedrooms), subjects indicated which level of the attribute they expected the new home to have; for those attributes that are either present or not present (e.g., vaulted ceilings), subjects just indicated which attributes they expected. The final attribute was the price range that the

subject expected to pay for his/her new home. An example of the reference point measurement protocol is shown in Appendix B.

To ensure that subjects had accurately selected their expectations, the computer then displayed the entire expected purchase profile for quality attributes and price range. If necessary, subjects could modify the profile until they were satisfied that it matched their expectations. The initial quality reference point was the sum of the desirability ratings (described below) of the 23 quality attributes that subjects indicated they expected to get in their home purchase. The initial reference price is the midpoint of the price range that matched the subjects' expectations of what they would pay for that home.

Next, subjects' value of each attribute was measured by asking how desirable it was. It was hypothesized that that subjects would incorporate the importance of each attribute in a desirability rating such that more important attributes would have more extreme measures of desirability and less important attributes would have relatively neutral levels of desirability. For example, if the number of bathrooms is very important, having 2 1/2 baths would be very desirable while having 1 bath would be very undesirable. If the type of basement is unimportant, the difference in the desirability of a full basement and a partial basement would be small. However, in order to confirm that importance was reflected in these desirability differences, importance was also measured for all 23 quality attributes.

The dialogue described desirability as 'how much you like different types of features' and told subjects that while an item could be desirable it might not be very important in choosing a home. Importance was simply described as 'how important these

different features are to you.' Desirability was measured with a 21-point scale (-10 = Very Undesirable, 0 = Neither Undesirable or Desirable, +10 = Very Desirable) and importance was measured with an 11-point scale (0 = Not at all Important, 10 = Very Important). Analysis revealed that subjects did incorporate the importance ratings into the desirability rating (Table 4). The more important attributes had higher desirability ratings, and for those attributes with several levels, the more important attributes exhibited a greater range on the desirability measure than the less important attributes. In addition, for the nine attributes that had several levels, the average correlation between importance and desirability range for subjects was .54 ( $p < .001$ ). Therefore, only the desirability scores were used for further analysis.

### Choice Task

The third section of the computer task was the choice task. The computer presented the following three screens after measuring the initial reference point and before showing the first house description:

#### *Transition Screen #1*

Thanks - that was very helpful information. Now we're ready to start looking at some houses.

I've found a number of houses that meet your general needs. We'll visit each one so you can evaluate it and let me know what you think about it.

#### *Transition Screen #2 (No Outlier Condition)*

I'm going to show you five houses that best match your expected profile. At each house, I'll ask you to tell me what you think about it. Feel free to type in comments about anything, including your general impressions of the house and/or specific items and features of the house.

As you see each house, you can make an offer on it or go on to visit the next one. If you choose not to make an offer when the house is displayed, you may still make an offer on it later. However, there are other people house-hunting in this market and the house may not be available at a later time.

*Transition Screen #2 (Outlier Conditions)*

I'm going to show you six houses that best match your expected profile, however, you may be surprised to find that the houses in this market are not very similar to what you expected. At each house, I'll ask you to tell me what you think about it. Feel free to type in comments about anything, including your general impressions of the house and/or specific items and features of the house.

As you see each house, you can make an offer on it or go on to visit the next one. If you choose not to make an offer when the house is displayed, you may still make an offer on it later. However, there are other people house-hunting in this market and the house may not be available at a later time.

*Transition Screen #3*

(A note from the researchers)

Of course, we can't really take you around to these imaginary houses in Ohio. Furthermore, we know that you wouldn't actually consider buying a house based just upon a computer description of it. However, for the purposes of this computer simulation, your task is to find the house that you would be most likely to buy, if any.

For each of these descriptions, please imagine that you are actually visiting the house and try to visualize it in your mind.

Respondents could evaluate all five (six) homes if they wished, but if any time during the task they found a home they would like to buy, they could make an offer for it and stop the presentation of additional alternatives. If subjects decided not to buy a home at the time it was evaluated, they could still choose it after evaluating other alternatives. If subjects did not choose one of the five (six) homes during the initial presentation, they were instructed to imagine that they had to pick one of these houses and asked which of the homes they would prefer to purchase. They could ask to re-examine any of the homes

they had already seen before making a choice<sup>1</sup>. The choice was completed when an offer was made for a home. Subjects then evaluated the house they had chosen on the five evaluation items shown in Part A of Appendix C.

#### Final Reference Point Measurement

The fourth part of the computer task remeasured the quality and price reference points to determine if the reference points had adapted as a result of the homes presented in the choice task. The dialogue offered the following explanation of why the computer agent was asking for the same information about expectations and certainty:

I hope you have enjoyed this computerized house purchase program so far. Before we move on to the next section, perhaps you could give me some information that would help me assist future buyers like yourself.

Now that you've had some experience looking at houses in this market, you may (or may not) have changed what you would expect to get in a home in this market. Suppose that your move was postponed for six months and you came back to look at houses again. If you had to start looking all over again, what would you realistically expect to get?

**NEXT SCREEN:** Shows the list of 24 home features with this dialogue at the top of the screen:

Based on your experience in this market, what features would you expect to get if you were looking for a house in about six months?

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<sup>1</sup>While re-examination of an alternative after a series of ordered alternatives has been evaluated does not strictly follow the order sequence, it is typical of what home buyers actually do when trying to decide which home to purchase. Allowing subjects to re-evaluate alternatives at the end of a choice set provides a more realistic choice task for the study and any results will have stronger implications for actual selling situations.



## Perceptual and Demographic Variables

The fifth and final part of the computer task obtained responses on the dependent measures of satisfaction with choice (Appendix C, Part B) and perception of the buyer-seller relationship quality (Appendix C, Part C and D). It also asked subjects to evaluate the task with regard to realism and involvement, and contained manipulation checks for outlier conditions (Appendix C, Part E). Finally, it asked for demographic information including gender, education, occupation, number of houses lived in, and number of times the subject had been a decision maker in a home purchase. Demographic factors are expected to affect couples' buying behavior, and as such, they are of interest for future research. For example, education and expertise in home buying may influence the amount of reference point adaptation. People with greater experience in buying homes may more readily accept different price-quality trade offs across regional real estate markets and their price and quality reference points may adapt more quickly.

Upon completion of the task, the computer program debriefed and thanked the participants.

## **Stimulus Materials**

The experimental stimuli are descriptions of homes available for purchase. Each home was described on at least 24 attributes, including price, in an multiple listing service (MLS) type format on the computer screen. As previously stated, the descriptive attributes and levels are shown in Appendix A. The price/quality configurations of

alternatives were based on each respondent's expectations for quality attributes and price, and the general price/quality attributes of the local real estate market.

The local real estate markets for both the pretest and the final data collection were ones where higher priced homes had more and/or better attributes than lower priced homes. Thus the house descriptions shown to a subject who expected to pay \$200,000 for a house differed substantially from those shown to a subject expecting to pay \$70,000. In this study, experimental stimuli were configured for five different price/quality ranges: \$50,000-\$69,999, \$70,000-\$89,999, \$90,000-\$119,999, \$120,000-\$149,999, and \$150,000-\$200,000. These levels were selected based upon the distribution of home sales Montgomery County, VA between 1992 and 1994<sup>2</sup>. Single family home sales in DeKalb County, IL in the last three years are consistent with these price categories. The midpoint of the subject's initial expected price range determined which of the five sets of house descriptions the subject saw.

The initial feature configurations were developed from extensive research of the real estate market in the Montgomery County, VA area and consultation with realtors. Pretests results prompted two modifications of these initial configurations. First, attributes were modified to be consistent with the northern Illinois real estate market, the final data collection location. Second, pretest debriefings revealed that a number of the subjects had difficulty detecting significant differences between the houses. A typical comment was, 'They all seemed pretty much alike.' Therefore, the house profiles were

further modified by adding additional descriptors to enhance the differences in quality among the five or six homes a subject could evaluate. Prior to the actual data collection, several people reviewed the questionnaire with the revised profiles. All of them indicated that they did detect noticeable differences in quality between the alternatives. Appendix D shows the final descriptions of the alternatives in each price level. The following sections describe the composition of the choice alternatives in more detail.

### *Attributes*

As stated previously, houses were described by the attributes listed in Appendix A. Not every house included every attribute description, but each house was described by at least 24 specific attributes that were used to measure the reference points. Those included 23 quality attributes and price. The quality attributes were further categorized into critical and negotiable attributes.

### *Critical and Negotiable Attributes*

The division of the quality attributes into critical and negotiable categories was based on the results of a pretest conducted with real estate agents (Appendix E). Agents were asked to rate twenty-six home attributes according to the percentage of buyers who consider the attribute important when buying a home. Agents were asked which attributes the buyers considered 'Critical to the decision,' Very important but negotiable,' or 'Somewhat important and negotiable.' Based upon the responses, number of bedrooms

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<sup>2</sup> Historic home sales data were obtained from the MLS database which listed the sales in \$10,000 increments. I collapsed the MLS price categories into the five price levels used for this study based upon groupings that contained at least 10% of the sales.

(90.5%), number of bathrooms (86.5%), and type of garage (72%) were selected as critical attributes for this study; the remaining attributes were considered negotiable. These three critical attributes were held constant across the five available alternatives in each subject's choice set and they matched the subject's expectations for his/her purchase.

Although type of neighborhood also appeared to be very important to buyers (86%), it was not included as a critical attribute because its multidimensionality makes it difficult to accurately describe with just a few categories and because realtors are not permitted to offer information or answer questions about the 'familiar status' of a neighborhood. Familiar status includes information regarding profiles of age, children, race, religions, etc.

Negotiable attributes were further classified *a priori* into important and less important attributes. Twenty important attributes were used to systematically vary the quality of alternatives within each choice set. These include basement, condition, heating, cooling, water, sewer, twelve interior features, and two exterior features. The less important negotiable attributes varied only by small amounts and were used to add to the realism of the stimulus descriptions. These include square footage, lot size, and age of the house. For example, the five alternatives in the \$90,000 - \$119,000 price level varied between 2470 and 2540 square feet, 1 and 1.5 acres, and 5 and 10 years old. Full descriptions of all alternatives in all price levels are shown in Appendix D.

### Quality Configuration

Quality configurations were designed by defining the attributes for the middle (third in a sequence of five) quality/price alternative (See Appendix D for the configuration for each price

level.). Those attributes were then adjusted to make two more attractive and two less attractive homes, for a total of five alternatives in the non-outlier conditions. Alternatives with higher levels of quality had more or better attributes than the middle alternative, those with lower levels of quality had fewer or worse attributes. For the three critical attributes (number of bedrooms, number of bathrooms, type of garage), the quality configuration of all five alternatives matched the subject's expectations. The remaining 20 measured negotiable quality attributes were configured to match the local real estate market for homes in the subject's price category.

Quality manipulations for the non-outlier conditions resulted from variations in the 'important but negotiable' and 'less important and negotiable' attributes. Important but negotiable attributes (basement, condition, heating/cooling, water/sewer, interior features, exterior features) were systematically varied across the five alternatives. As stated earlier, the less important and negotiable attributes (square footage, lot size, and age of house) varied by small amounts to make the stimuli descriptions more realistic.

House descriptions also included the address and some miscellaneous items to strengthen the realism of the descriptions and to enhance the quality of the better homes. The miscellaneous items included such things as low maintenance exterior, very low maintenance interior and exterior, freshly painted inside and out, convenient location, move-in condition, bright, airy rooms, and fantastic view. For a complete list of these items, see Table 5.

Systematic variations in critical attributes (bedrooms, bathrooms, garage) were used to manipulate the quality of the outliers. The moderate outlier, relative to the highest quality non-outlier alternative, had an additional bedroom and bathroom, two additional interior features, and one additional exterior feature. For example, in the \$70,000 - \$89,999 price category, the

moderate outlier adds walk-in closets, a fireplace, and a convenient location in addition to one better level of bedrooms and bathroom than what the subject expected. In the \$110,000 - \$149,999 price category, the moderate outlier adds skylights, a pantry, and a deck in addition to the increases in bedroom and bathroom expectations. Moderate outliers also had approximately ten percent more square footage than the middle quality, non-outlier alternative.

The extreme outlier had the same quality configuration for all price levels. It was a new house and consisted of 6 bedrooms, 4 baths, 4200 square feet, 10 acres, decorator touches, a full, finished basement with bath, public water and sewer, natural gas heat, 2-zone central air cooling, solar panels, central air, all available appliances, 2 decks, screened porch, a pool, and virtually all interior features, some of which are not included in any other descriptions (e.g., solar panels, landscaped yard, guest house).

### Price Configuration

Prices for the alternatives were derived from the expected price range of the buyer. The five alternatives in the non-outlier conditions were priced so that when ordered, there was an equal interval between each alternative's price. The lowest quality alternative was priced at the lower end of the subject's expected price range, the middle quality alternative was at the midpoint of the subject's expected price range, and the highest quality alternative was priced at the upper end of the expected price range. The other two alternatives were priced equidistant between adjacent alternatives. The exact price of each of the five alternatives was then adjusted by a nominal amount to avoid subjects perceiving systematic price intervals. The adjustment amount was either 1% or 3%, which was either subtracted or added. Prices were then rounded to the

nearest \$10.00. The specific adjustment and the operation were randomly selected by the Ci3 computer program.

The prices of the outlier alternatives were configured so the moderate outlier was affordable with negotiation and the extreme outlier was not affordable. Both of these prices were computed from the price that subjects reported as the most they could afford to pay for a house. The moderate outlier was priced at 105% of the most the buyer can afford for a house, the extreme outlier was priced at 200% of the highest affordable amount.

One problem that could arise with this price configuration concerns variations in the expected price range width for different subjects. Buyers who had a very narrow price range saw alternatives that may have been unrealistic in terms of the amount of increase or decrease in quality for the change in price. Those with very wide expected price ranges saw small changes in quality for large changes in price. However, given that buyers may have made inferences about home attributes not included in the description, they may have assumed that the price/quality change discrepancies could be explained by other attributes. The subject's price range was not significantly correlated with perceptions of differences between the houses, therefore, it is unlikely that this problem affected the dependent variables.

## **Operationalization and Measurement of Variables**

### *Independent Variables*

The independent variables of order of presentation and presentation of outlying alternatives are operationalized through the design of the experimental stimuli. The initial

reference points for price and quality are measured using the subject's expectations for the home purchase.

### Order of Presentation

Figure 3 shows from left to right the presentation order of five (six) alternatives in a market where the buyer has relatively accurate expectations of the price-quality tradeoffs that have to be made. For simplicity, order is expressed as the trend in quality attractiveness. The five alternatives were presented to the buyer in one of three orders; ascending quality, descending quality, and a non-monotonic order of quality (not shown in Figure 3). The ascending trend presented the lowest quality, lowest priced alternative first. Each successive alternative had higher quality and a higher price. The descending trend presented the highest quality, highest priced alternative first and each successive alternative had lower quality and a lower price. Finally, two non-monotonic trends were designed so that the middle price/quality alternative was first and no sequence of three or more alternatives had either an ascending or descending trend in quality. If alternatives are ordered and labeled so that "1" represents the lowest price/lowest quality alternative and "5" represents the highest price/highest quality alternative, then the two non-monotonic orders are 3,1,5,2,4 and 3,5,1,4,2. Subjects in the non-monotonic conditions were randomly assigned to one of these two preselected non-monotonic orders.

### Presentation of Outlying Alternatives

The presentation of outlying alternatives has three conditions; no outliers, a moderate outlier, and an extreme outlier. The no outlier condition presents five alternatives that meet the buyer's expectations for critical attributes and fall within the



buyer's expected price range. The moderate and extreme outlier conditions are shown in Figure 4. The moderate outlier has better quality than expected and is just marginally affordable. This was operationalized by giving a higher than expected level of two critical attributes (number bedrooms and bathrooms) along with higher levels of several negotiable attributes (“fantastic view” rather than “view”). The price of this outlier is 5% higher than the upper price limit of what the buyer was willing to pay for a house, but it might be affordable with negotiation. Negotiation of selling price is common in the real estate industry and the presence of an alternative slightly above the buyer's upper price limit should not be perceived as unusual or completely unacceptable. The exact configuration of the moderate outlier for each price level is included in Appendix D.

The extreme outlier had much better quality than expected but was completely out of the range of affordability even with reasonable negotiation of the selling price. This outlier has better than expected levels of all three critical and negotiable attributes, along with additional benefits not included in the descriptions of the other alternatives (Jacuzzi, tremendous view, landscaped yard, guest house). Thus, this outlier was extremely attractive with respect to quality when compared to the other alternatives the buyer evaluated, but the price was set at 200% of the most the subject had stated they could afford to pay for a house. The extreme outlier is shown in Appendix D.

Outliers were presented consistent with the order of presentation. For example, subjects assigned to the descending order evaluated the outlier before the other five alternatives. Subjects assigned to the ascending order evaluated the outlier after the other

alternatives. As stated earlier, outliers were not presented in the non-monotonic order conditions.

The presentation of the extreme outlier presents a problem for the ecological validity of the research, especially with respect to the real estate market. Real estate agents are charged with a fiduciary responsibility to the seller and cannot legally show a house to buyers who cannot afford it. However, there are other selling situations where a salesperson might logically, if not legally, show an unaffordable option to a buyer. This might be done in an effort to educate the buyer about the complete range of attributes, especially if the buyer's wealth position is likely to change and s/he may later purchase a higher priced product. Sellers may also 'test the waters' to see just how much money a buyer is willing to spend for the current purchase. For respondents unaware of realtors' legal limitations, a plausible guise for presenting outliers may be constructed.

For these two substantive reasons, as well as theoretical considerations, the effects of extreme outliers are of interest in this research. To reduce any ethical considerations in the real estate market, prior to presenting the outlier, the computer agent made the following statement:

By the way, people who are new to an area usually find that it is helpful to see a broad range of houses so they can get a feel for that real estate market in the new area. Seeing a wide range of houses usually provides you with good information for evaluating those houses.

This first [next] house I'm going to show you isn't exactly what you are looking for, but it may help you get some perspective on what the market has to offer.

The debriefing also explained to the subjects that any strategies the computer agent appeared to use were hypothetical and are not necessarily used by actual real estate agents.

This scenario and the debriefing was reviewed with participating realtors. They had no ethical reservations about the scenario.

### Initial Reference Points

Two types of reference points were measured, price and quality. These were both measured twice; once before the choice task to assess the initial reference point, and once after the choice task to assess the final reference point. The measurement procedure for each initial reference point is discussed below.

#### *Initial Price Reference Point*

The initial price reference point is the point estimate of the buyer's expectations about what will be paid for the new home. It is measured by asking the buyer to specify the price range within which s/he expects the new home to fall. The midpoint of this expected price range is the price reference point. The initial price reference point is:

$$\text{Initial Price Reference Point} = \frac{\text{Initial Price Range}_{ul} - \text{Initial Price Range}_{ll}}{2} + \text{Initial}$$

Price Range<sub>ll</sub>

Where:

Initial Price Range<sub>ul</sub> = Upper limit of initial price range

Initial Price Range<sub>ll</sub> = Lower limit of initial price range

### *Initial Quality Reference Point*

The quality reference point is the buyer's expectations of attribute levels that the new home will have. This is a point estimate of quality expectations. For any buyer, some attributes are likely to be more important than others, but, as noted previously, the more important attributes exhibited wider ranges in the desirability rating scale indicating that different levels of the more important attributes did indeed have larger shifts in desirability. Therefore, the desirability ratings were used to assess the quality reference point. The initial quality reference point represents the total desirability of the expected purchase. The measure is:

$$\text{Initial Quality Reference Point} = \sum_{i=1}^k D_i$$

Where:

$D_i$  = Desirability rating of initially expected  $i$ th attribute or attribute level

$k$  = Number of measured quality attributes (23)

The variable  $D_i$  represents the buyer's desirability rating of each of the 23 measured quality attributes. These ratings range from -10 (Very Undesirable) to +10 (Very Desirable) and were scored on a scale of 1 to 21. The initial quality reference point, therefore, may range from 23 to 486, with higher positive scores representing greater levels of desirability and lower negative scores representing greater levels of undesirability. A score of 243 indicates an expectation for a home that is neither desirable nor undesirable.

### *Dependent Variables*

Dependent variables consisted of search length, price-quality choice, evaluation of alternatives, buyer's satisfaction with choice, and buyer's perceptions of the buyer-seller relationship.

#### **Length of Search**

Length of search is measured by the number of houses the subjects examined. Maximum search length varied from 1 to 6 depending upon the condition to which the subject was assigned and the number of alternatives the subject searched. A second measure of length of search asked subjects how many more houses they would ask to look at if the one they chose was not available. This measure should indicate subjects' expectations about extended search if they were unhappy with their forced choice and none of the other alternatives they viewed was an acceptable second choice.

#### **Price-Quality Choice**

The choice variable was assigned an ordinal value of one through six based upon the price-quality configuration where 1 = the low price, low quality alternative, 5 = the high price, high quality alternative, and 6 = the outlier.

#### **Evaluation of Alternatives**

Subjects evaluated only the chosen alternative. Evaluations were not made for each alternative because there was a possibility that evaluations would be subject to response scale effects. This effect occurs when changes in evaluations are the result of differences in the objects' value ranges rather than actual perceptions of differences between objects (Lynch, Chakravarti, and Mitra, 1991). Because subjects in different

orders might evaluate sets of alternatives with different attribute value ranges, response scale effects could occur in this study. The potential for response scale effects presents two problems: 1) response scale effects can affect behavioral measures (choice) when ratings appear prior to the behavioral measures, and 2) response scale effects are difficult, if not impossible, to detect when value ranges differ on several dimensions. Both of these situations are present in this study if subjects evaluate each alternative. Therefore, it was deemed inadvisable to collect evaluations of each alternative during the choice task. Instead, subjects rated the only the alternative they chose and then evaluations of the alternatives were compared across order and outlier conditions for each chosen alternative within a price level.

After choosing an alternative, subjects rated it on the five items listed in Appendix C, Part A. Two items asked for ratings of overall desirability and excellence of features, quality and price; one item asked for ratings of attractiveness of features and quality without regard for price, another item asked for ratings of attractiveness of price without regard for features and quality. The fifth item asked subjects to rate the chosen alternative on a scale of 1 to 100 where 1 was the worst house imaginable and 100 was an ideal house. Coefficient alpha for the five items was .84. A factor analysis revealed that the five items loaded on a single factor with an eigenvalue of 3.09, extracting 61.8% of the variance. The five items were then standardized and combined and the standardized score of the combined five items was used for analysis of evaluation of the chosen alternative.

## Satisfaction with Choice

The pretest included a 6-item Likert scale from Oliver (1980) assessing the subject's satisfaction with his/her choice outcome (Appendix C, Part B). These items reflect a subject's satisfaction with the decision process and, consistent with other similar measures of satisfaction (e.g., Churchill and Surprenant, 1982; Swan 1988), are affective items. Coefficient alpha was .86 for these six items in the pretest.

This scale was then reduced for the final data collection in an effort to keep the questionnaire to a reasonable length that could be completed in about 35 minutes. Items that had factor loading values over .80 were selected for the final scale; they are noted in Appendix C, Part B. Coefficient alpha of the reduced set of three items was .83.

Another aspect of satisfaction is satisfaction with the actual choice. A separate three-item scale to measure satisfaction with the chosen house was developed and pretested for internal consistency ( $\alpha = .74$ ). The three items for this scale are also listed in Appendix C, Part B.

Factor analysis of the final data revealed a single dimension for the three satisfaction with choice outcome and the three satisfaction with choice items (eigenvalue = 4.25, variance extracted = 70.8%). Therefore, for the final analysis, the six items were combined into a single scale for satisfaction ( $\alpha=.91$ )

## Buyer's Perception of the Buyer-Seller Relationship Quality

A reduced set of the Crosby, Evans, and Cowles (1990) relationship quality scale was used to measure the buyer's perception of the buyer-seller relationship quality. The full scale consists of twelve items and has exhibited adequate reliability ( $\alpha=.76$ ) and

convergent and discriminant validity (Crosby, Evans, and Cowles 1990). It measures two dimensions of relationship quality. The first dimension is satisfaction with the salesperson, measured with 3 semantic differential items ( $\alpha=.99$ ). The second dimension is trust in the salesperson which is measured using 9 Likert scale items ( $\alpha=.89$ ). The scores on the relationship quality scale have been shown to have a significant influence on intentions of future interactions with the salesperson, which is of substantive interest to marketers.

Pretest results were used to reduce the number of items in this scale to keep the questionnaire to a reasonable length. Two criteria were used for selecting items for the final scale. First, items whose elimination would increase coefficient alpha of the dimension were dropped. Second, only items with factor loadings above .80 were kept in the scale. The resulting subset consisted of six items, two for satisfaction with salesperson and four for trust in salesperson. Coefficient alpha for this subset was .86. The full scale and the subset used for the final data collection are shown in Appendix C, Part C.

Another measure of perception of buyer-seller relationship is that of anticipation of future interaction. This was measured using two items, exhibiting an inter-item correlation of .79 in the pretest. The two items are listed in Appendix C, Part D.

A principal components analysis of the final data for perceptions of buyer-seller relationship revealed a single factor solution for the eight items (six items from the reduced Crosby, Evans, and Cowles scale and two from the anticipation of future interaction scale) which extracted 61.7 percent of the variance and had an eigenvalue of



4.93. Coefficient alpha of these eight items was .91. Therefore, the eight items were collapsed into a single variable which was used in the buyer-seller relationship analysis.

### *Mediating Variables*

Final reference points are expected to mediate the relationship between the independent and dependent variables. Two types of final reference point are measured, price and quality. The final reference point measurement was identical to the initial reference point measurement but it was collected after the choice task.

#### **Final Price Reference Point**

After making a choice, buyers were asked for their expectations about what they would pay for a home in this hypothetical market based upon their recent experience searching in it. Subjects entered the price range that they expected to pay; the midpoint of that range was used as the final price reference point.

#### **Final Quality Reference Point**

After the choice task, the hypothetical real estate agent in the questionnaire asked subjects to report their expectations about getting the 23 quality attributes now that they had some experience searching in this hypothetical market. The final quality reference point was computed similarly to that of the initial quality reference point; the attribute desirability ratings (measured prior to the choice task) of each of the 23 final expectations were summed to provide a point estimate of the final quality reference point.

$$\text{Final Quality Reference Point} = \sum_{i=1}^k D_i$$

Where:

$D_i$  = Desirability rating of final expectation of  $i$ th attribute or attribute level

$k$  = Number of measured quality attributes (23)

The score for the final quality reference point (potential range between 23 and 486) is interpreted in the same manner as that of the initial quality reference point.

The alternatives in the choice task, however, were described by more than the 23 attributes measured in the quality reference point. As discussed earlier, pretest debriefings indicated that the descriptions were somewhat colorless with no distinct differences between attributes. Therefore, additional attributes were added to the descriptions and some descriptions were modified in order to design the alternatives so that each had a reasonable level of quality for the various price categories of houses, and also so that the five (six) houses in each choice task had distinguishable differences in quality. The additional and modified attributes for each price level were selected from MLS listings for that price level, and from a source that listed current national commonly popular home features (Kiplinger Washington News Letter, 1996). Examples of the added attributes include master bedroom on the first floor, big center-island kitchen, wiring for home office. The full list of non-measured attributes is shown in Table 5.

Adding these additional descriptors did appear to enhance the differences between the alternatives, as reported by several questionnaire reviewers prior to the final data collection. It was expected that adding these additional descriptors would result in a conservative measure of final reference points because not all quality attributes were being measured. Thus, the final quality reference point would understate the actual adaptation,

especially for increases in the reference point. I assumed that the attributes in the reference point measure reflected most of the utility derived from the description because those attributes were the ones that realtors had identified as being most important to buyers (Appendix E).

However, two problems with this procedure surfaced after the data collection. First, because there was limited space available on the computer screen, sometimes when additional attributes were added others had to be eliminated. Occasionally, the eliminated attributes were ones that were measured as part of the quality reference point. This created problems for measuring increases in the quality reference point because now subjects might expect an attribute that was described but not measured (e.g., master bedroom on first floor) and not expect an item that was eliminated from the description but measured (e.g., smoke alarms). Second, inadvertently, some of the non-measured descriptions included potentially highly-valued items (e.g., fantastic view, bright airy rooms, impressive stone fireplace).

The extent to which this problem might affect the detection of the final quality reference point as a mediating variable is unknown. Several analyses were done to determine whether the final reference point measure was unusable or just understated. If unusable, such that it fails to reflect the intended order or desirability among alternatives, no tests for mediation can be done. If the measure is usable but understated, this works against the mediation hypothesis.

First, I examined the accuracy of the alternatives' desirability configuration. If the alternatives are properly designed to have different levels of quality and the quality

reference point measure is capturing that desirability, then there should be significant differences between the summed desirability ratings of adjacent alternatives within a choice set. Table 6 reports the mean desirability ratings of alternatives in the five choice sets; in 25 of the possible 30 comparisons, there was a significant difference in desirability ratings between adjacent alternatives. For three comparisons, desirability differences were in the right direction, but non-significant. For the other two the difference between the mean desirability was significant but in the wrong direction. Thus, it appears that the alternatives are generally perceived as expected and that the quality reference point measure is reflecting desirability ratings.

Second, I examined changes in the quality reference point. If the quality reference point measure is adapting and the measure is capturing a significant portion of that adaptation, then there should be differences between the initial and final measurements. A paired t-test indicated that there was a significant difference between the subjects' initial and final quality reference points (Means: Initial=326.34, Final=318.28;  $t = -2.65$ ,  $p = .009$ ). These two analyses indicate that the measure is usable to capture differences in quality as measured by the desirability ratings.

Thus, it appears that the design created differential desirabilities between alternatives and those differences can be measured by the quality reference point. However, the quality reference point may be understated, making it difficult to detect any mediating effects.

This chapter specified the research design, domain, and subjects. The research procedure and computer task were described and then stimulus materials and the

operationalizations of variables were presented. The next chapter presents the results of the hypotheses analyses.

## **CHAPTER 4 DATA ANALYSIS AND RESULTS**

This chapter presents the results of the data analyses detailed in Chapter 3. First, I describe the sample, report measure reliabilities, and discuss the results of manipulation checks. Next, I present the general theoretical model and tests for order and outlier effects. The reader is referred to Table 1 for a list of the specific hypotheses.

### **Sample**

One hundred thirty-seven diskettes were sent out to people responding to classified ads and flyers at realtors' offices; 127 were returned for a response rate of 92%. There are several plausible reasons for the high response rate, the most probable being high level of interest and commitment. First, subjects had to have some level of interest to respond to the newspaper ad. Second, the \$25.00 dollar incentive was sent with the questionnaire diskette and instructions. The receipt of the money prior to task completion in all likelihood induced commitment on the part of the subject to complete the survey and send back the diskette. Two of the returned diskettes were unusable because questionnaire data file was either not present or inaccessible resulting in a sample of 125.<sup>3</sup>

The diskettes were distributed across the seven experimental cells as previously shown in Table 3 in the Original Manipulation section. As discussed in Chapter 3, however, not all of the subjects who were assigned an outlier condition in the ascending

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<sup>3</sup> One subject did not answer any questions after the final reference point measurement. Therefore, n=124 for analysis of task, perceptual, and demographic variables and n=125 for analysis of reference point, search, and choice variables.

order searched long enough to see the outlier. This occurred with eight subjects in both the Ascending, Moderate Outlier and Ascending, Extreme Outlier conditions. As discussed in detail later, these subjects could be reassigned to the Ascending, No Outlier condition or dropped from the analysis. The resulting distributions of subjects for each method are shown in Table 3.

### *Sample Demographics*

Table 7 shows the demographic profile of subjects. The sample had approximately equal numbers of males (62) and females (63). Seventy-seven percent of the sample was married, 15 % was single, and 6% was divorced. The average household size was 3.2, 40% had an educational level of either high school or some college, the remaining 60% were relatively evenly split between the four levels of undergraduate degree, some graduate work, a master's degree, and a professional degree. Average income of the sample was \$52,449. The mean number of houses lived in by the sample was 3.7 and the mean number of times subjects had been decision makers in a home purchase was 2.2.

As indicated by the figures in Table 7, the sample demographics are similar to those of Illinois home owners and it appears that the sample is representative of the population of interest with the exception of education. The sample had higher levels of education than that of both Illinois and United States. This was most likely the result of several factors. First, subjects were recruited through a newspaper ad. Second, subjects needed to be somewhat computer literate and have access to a computer to participate.

Third, subjects must have relatively high income levels to afford home ownership. Finally, the sampled geographic area included two medium to large universities and several community colleges. These factors all contributed to the high educational level of the sample. It is possible that the hypothesized effects may be influenced by level of education, but that influence would likely minimize effects of reference points. People with higher levels of education may have higher need for cognition and approach the home purchase task more analytically, have better defined decision rules, and have stronger adherence to those rules. Educational level, however, was not significantly correlated with any of the dependent variables. The only significant correlates with education were the initial price range, the price level of the houses, whether subjects noticed the order of presentation, and their self-reported ability to visualize the houses.

Subjects with higher levels of education had wider price ranges and higher price levels for houses. Both of these relationships may be attributed to higher income levels. More highly educated subjects also tended to notice the order with greater frequency (81% vs. 65%), although they were not significantly better at correctly identifying the order (62% vs. 59%). They also reported less ability to visualize the houses than subjects with less education (Upper median education = 6.8, Lower median education = 8.0,  $t = -2.57$ ,  $p = .01$ ). The lack of any significant correlations with reference point changes and the other dependent variables indicates that the high level of education for this sample is probably not a significant boundary in interpreting any results.



## **Measure Reliabilities**

### *Desirability, Importance, Certainty*

The instrument contained single item measures of the three constructs of certainty of getting a feature, desirability (value) of attributes, and importance of attributes. While multiple item measures are generally regarded as more reliable and preferable in marketing research (Churchill 1979), practical considerations of questionnaire length precluded multiple measures of these three constructs for each of the 23 measured quality attributes. However, a pretest did assess the reliability of the items using a test-retest method. For each construct, two different house attributes were selected to assess the reliability of the single item by asking the same item twice. The number of intervening questions between identical items ranged from 4 to 13. Table 8 shows the items and coefficient alphas. The desirability and importance constructs exhibited adequate reliability, with coefficient alphas ranging from .92 to .98. For the certainty construct, coefficient alpha of the “house condition” attribute was acceptable (.91), but for the other attribute, the “presence of a workshop,” reliability was unacceptably low (.30). Upon investigation, the low reliability appeared to be a methodological problem and, therefore, single item measures for all three constructs were deemed acceptable for this study.

The methodological problem resulted from a reversal in the framing of the two certainty measures for those subjects who did not expect a workshop. The first certainty measure asked subjects about how certain they were of getting the expected level of the

23 quality house attributes. For example, if a person indicated s/he expected a workshop, the program asked how certain s/he was of getting a workshop; if the subject indicated s/he did not expect a workshop, the program asked how certain s/he was of not getting a workshop. However, the second certainty item for the workshop attribute (which was used only to assess the reliability of the certainty item) was always expressed in terms of having a workshop. This was no problem for those subjects who expected a workshop in their new home, but resulted in a reversal in question framing for subjects who did not expect to get a workshop. For example, for those subjects who said they did not expect a workshop, the first item asked 'How certain are you that you will NOT have a workshop in your new home?' The second item asked 'How certain are you that you will have a workshop in your new home?'

Upon closer inspection, coefficient alpha between the two certainty items for subjects who expected a workshop was .92, but for subjects who did not expect a workshop, it was -.25. These results indicate a methodological problem reflecting the manner in which the second item was asked. Reliability of the certainty construct items was only a problem when subjects did not expect a workshop because the second item was expressed in a manner inconsistent with expectations. Logically, subjects would find it difficult to state their confidence about something not happening. When the item was phrased consistent with expectations, the reliability was high. The certainty item used in the final instrument asked about certainty in a manner consistent with the subjects' expectations. Therefore, it was assumed that single item measures for the constructs of

certainty, desirability, and importance should not present significant reliability problems in this study. However, it is possible that the certainty measure is not reliable when subjects do not expect to get an attribute.

### *Relationship and Satisfaction*

There were several scales used to measure relationship with the salesperson, anticipation of future interaction, satisfaction with choice, and satisfaction with choice outcome. As explained earlier, some of the scales developed by previous research (Crosby, Evans, and Cowles 1990, Oliver 1980) were modified for this study. Table 9 presents published reliability measures for the pre-existing scales, pretest reliabilities for all scales, and reliabilities for the modified scales used in the final data collection. All pretest scale reliabilities were deemed acceptable using Nunnally's guidelines (1978).

As discussed in Chapter 3, pretest subjects indicated that the questionnaire was too long and became fatiguing/tiresome during the 34 perceptual and demographic items after the choice task. Therefore the number of scale items was reduced for the final instrument. Table 9 also shows the reliabilities for the reduced scales from the pretest data and from the final test data. Reliability measures with Cronbach's alpha are at acceptable levels for social science descriptive research. Appendix C, Parts B, C, and D, identify the reduced item scales.

### *Manipulation Checks and Task Involvement*

Nine items were included in the questionnaire as manipulation checks for quality and outlier conditions and measures of task involvement. The results for each group of items are discussed below. Comparisons of the two non-monotonic orders of presentation are also presented.

#### **Quality and Outlier Conditions**

Three questions were developed to assess whether the outlier manipulations were effective in creating alternatives that exceeded expectations for price and quality. The 7-point Likert items asked subjects to indicate their agreement (1= Strongly Disagree, 7= Strongly Agree) with the following statements:

- 1) The houses were what I expected
- 2) I was surprised at some of the houses
- 3) There weren't many differences between the houses.

It was predicted that subjects in the outlier conditions should agree less with the three statements, and those in the Extreme Outlier condition should have the highest levels of disagreement. Table 10 presents the means for the three statements for each of the outlier conditions.

There was no significant difference between outlier conditions for the houses being as expected. All three means were significantly greater than the scale midpoint 4.0, indicating that all subjects agreed that the houses were what they expected. The lack of

significant differences between the three conditions may have been due to the scenario for the outlier groups which included the statement that some of the houses they would see might not be exactly like what they expected. This was done to reduce possible reactance to being shown the outlier.

The Moderate Outlier and Extreme Outlier conditions expressed significantly more “surprise at some of the houses” than the No Outlier condition, and both were significantly greater than the scale mean. The No Outlier condition mean was significantly less than the scale mean for being surprised at some of the houses.

The No Outlier and Moderate Outlier conditions were not significantly different from the scale midpoint for the third manipulation check for outliers, indicating that subjects neither agreed nor disagreed that there weren’t many differences between the houses. As predicted, however, the Extreme Outlier condition disagreed with this statement and was significantly lower than both of the other conditions. In general, the direction of these measures supports the Extreme Outlier manipulation, but it is possible that respondents did not view the moderate outlier as being beyond their expected range. Whether this is the result of the manipulation itself or the scenario description reducing surprise is unknown.

### **Order of Presentation**

Subjects were asked if they noticed whether the agent had presented the houses in any order. If they responded “Yes,” they were then asked what that order was. Their

choices were decreasing price, increasing price, nearest first, farthest first, and couldn't tell. Table 11 shows the distribution of subjects in the three different presentation orders who were correct and incorrect. Seventy-six subjects (61%) were correct in identifying the order as either ascending, descending, or no order (non-monotonic order). While this is significantly greater than what would be expected from chance (20%), it still implies that many subjects (39%) either didn't notice an order or incorrectly identified an order. Thus, it is unlikely that any effects from order of presentation are caused by the subject having noticed the order. In fact, using correct identification of presentation order was not a significant covariate for order effects on any of the dependent variables of search, evaluation, and choice.

## Task Involvement

### *Involvement*

Two items assessed the subjects' involvement in the task. These 11-point Likert items asked subjects to indicate their level of interest (1=Not Very Interesting At All, 11=Very Interesting) in the questionnaire and how seriously (1=Not Seriously At All, 11=Very Seriously) they took the house purchase task in the questionnaire. The means for these items are shown in Table 12. Both item means were significantly above the scale midpoint (6.0), indicating relatively high levels of involvement and seriousness. These results support the notion that subjects were interested in the task and took it seriously.

### *Visualization*

It was important that subjects be able to visualize the stimuli to make the task more realistic, otherwise, the house descriptions may not have provided a vivid enough stimulus to affect reference points and search. The two 11-point Likert items (1=Not Very Well At All, 11=Very Well) asked how well subjects could visualize the houses being described and how well they could visualize Susan Brown, the fictional real estate agent. The means for these items are shown in Table 12. Subjects indicated that they could visualize the houses fairly well, but could not visualize Susan Brown well. The latter result is unsurprising in that the program did not provide much description of Susan Brown and her dialogue was purposely designed as neutral to avoid uncontrolled liking of or aversion to the agent affecting the search process. In all likelihood, this somewhat bland description resulted in poor visualization of Susan Brown.

### **Non-Monotonic Orders**

The 16 subjects in the non-monotonic order condition were split between two orders of price and quality. Nine subjects evaluated the alternatives in order 3-1-5-2-4; seven evaluated alternatives in order 3-5-1-4-2.<sup>4</sup> Before combining the two groups, they were compared across the four types of variables in the study: demographic (gender, marital status, income, price category of house, and maximum affordable house); task (time to complete, noticed order, correctly noticed order, taking task seriously, ability to

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<sup>4</sup> The reader will remember that for ease of discussion, the alternatives are numbered so that 1 is the low price/low quality option and 5 is the high price/high quality option.

visualize houses and agent, and level of expertise in buying homes); process (number of homes evaluated, choice, number of additional homes to be viewed if choice was not available); and perception (relationship quality, satisfaction with choice, satisfaction with choice outcome, anticipation of future interaction, and how well the homes matched their expectations). There were no significant differences at the  $\alpha=.05$  level between the two non-monotonic orders for any of these variables. Therefore, the two groups were combined for further analysis.

In summary, these analyses show no serious problems with the questionnaire or manipulations, and show that subjects took the task seriously. The next section presents the model for each set of hypotheses and the results of the data analysis.

### **Model**

Figure 1 depicts the general theoretical model. Final reference points are expected to mediate the relationship between order and outliers and the dependent variables of alternative evaluation, search length, and choice. Initial reference points, while not manipulated in this study, are also expected to have significant effects on final reference points. Order and outliers are expected to have direct effects on satisfaction and perceptions of buyer-seller relationship.

According to Baron and Kenny (1986), the first step in identifying a mediating relationship is to show a direct relationship between the independent and dependent variables. If significant direct effects are found, then one must next show a significant relationship between the independent variables and the mediating variable(s). Finally, the



mediating relationship is determined by showing that including the mediating variable(s) in the model results in a significant effect of the mediator(s) on the dependent variables and reduces the significance of the independent variable effects on the dependent variables. Therefore, the hypothesized direct effects of order and outliers are tested first with initial reference points as a covariate, and then the mediating relationship of reference point adaptation is tested. Table 1 provides a list of the specific hypotheses.

### **Overview of Analysis**

The general factorial ANOVA procedure was used to test for order and outlier effects on evaluation of alternatives, search length, satisfaction, and buyer perceptions of buyer-seller relationship. This procedure was selected because it allows use of the full sample and increases power, can detect interactions, and is not particularly sensitive to unequal cell sizes, which occurred in this study. A non-parametric test (Somer's D, a version of gamma which accounts for ties) was used to analyze order and outlier effects on choice.

The design was an incomplete factorial design; the non-monotonic order was not crossed with the outlier conditions (Figure 5). The effects of non-monotonic order are presented first using only the three No Outlier conditions. Subsequent tests for order and outlier effects dropped the non-monotonic order cell from the analysis, producing a 2 (Ascending, Descending) X 3 (No Outlier, Extreme Outlier, Moderate Outlier) factorial design. Those analyses are presented below for each dependent variable.

As previously stated, more subjects were assigned to the ascending outlier conditions so that even if all subjects didn't search long enough to see the outlier, there was greater likelihood that there would be enough subjects to analyze the effects of outliers presented in an ascending order. Sixteen subjects assigned to the ascending outliers conditions did not search long enough to see the outliers. There are at least three possible methods of handling these 16 subjects, each of which produces a different potential bias in interpreting results. First, the subjects can be left in the intended outlier manipulation (original assignment). While this maintains random assignment to groups, it also weakens the outlier manipulation and potential for finding significant effects of outliers. Second, these sixteen subjects could be dropped from the analysis. This, however, results in a loss of power and introduces a potential bias by eliminating subjects who are low searchers; people who didn't search very much could have been less involved or have had lower initial reference points and were more easily satisfied. While the number of houses evaluated (COUNT) was not significantly correlated with involvement ( $r = .11$ ,  $p = .21$ ), it was with initial reference points (PRICE:  $r = -.23$ ,  $p = .01$ ; QUALITY:  $r = -.20$ ,  $p = .03$ ). The 16 subjects who didn't search long enough to see an outlier actually had significantly higher initial reference points than the other 43 subjects who were assigned to the ascending condition (PRICE:  $t = -3.11$ ,  $p = .003$ ; QUALITY:  $t = -1.97$ ,  $p = .05$ ). Further investigation revealed that this may have been a result of the price level of houses people evaluated. The group of 16 who didn't search long enough to see the outlier evaluated houses that were in a significantly higher price category than the

other subjects assigned to ascending conditions (MEAN: Ascending, Didn't See Outlier = 4.38, Ascending, Saw Outlier = 3.79,  $p = .02$ ). These 16 may have stopped search early because they saw better houses. Therefore, if these 16 are dropped from the analysis, a bias may result from eliminating subjects in higher price/higher quality homes.

Finally, the 16 subjects could be reclassified into the condition that they actually saw: ascending order, no outliers. This maintains power but also may introduce bias by adding 16 low searchers to the ascending condition and eliminating the low searchers from the outlier condition. In fact, these sixteen did search significantly less than other people assigned to the ascending, no outlier condition (MEAN: Ascending Low Searchers = 3.00, Other Ascending = 4.24,  $p = .02$ ). However, they were not significantly different from subjects assigned to the descending, no outlier condition (MEAN: Ascending Low Searchers = 3.00, Descending, No Outlier = 3.47,  $p = .43$ ). Therefore, reassigning the 16 may make it more difficult to detect differences in search length between order conditions.

The primary direct effects analyses used the original classification of subjects. If there were no outlier effects, then the analyses were rerun dropping the subjects who didn't see outliers in the ascending condition to determine whether a stronger test of outliers (albeit with lower power and some introduced bias) would produce significant outlier effects. Analyses were not computed using the reclassification of these sixteen subjects because that introduced two potential biases. Generally, results were consistent across the two methods, indicating that potential bias introduced by the dropping method

was not significant. Any differences between the two analyses are noted in the results discussions.

### *Non-monotonic Order Effects*

Realtors often show homes in a geographic order, which can result in a non-monotonic order of price and quality presentation. Therefore, differences between non-monotonic and descending or ascending orders are of substantive interest. A MANOVA with initial reference points as covariates was run for the No Outlier conditions to test whether a non-monotonic order differed from the other orders for effects on evaluation of alternatives (H1a), search length (H1b), satisfaction (H3a), and buyer perceptions of the buyer-seller relationship (exploratory). Somer's D was calculated for order effects on choice (H1c).

The overall MANOVA design did not have homogeneous variances, primarily because of unequal variances for evaluation of alternatives. Furthermore, search length was not normally distributed. The removal of two outliers on evaluation of alternatives in the ascending order resulted in homogeneous error variances for that variable and for the MANOVA (Box's M = 19.6, F = 1.46, p = .13). However, no transformation could make search length approximate a normal distribution. Therefore, it was analyzed using non-parametric tests.

Search length ranged from 1 to 5, but was highly skewed; thirty-three (66%) of the 50 subjects evaluated 5 houses, another 11 (22%) evaluated just one house. COUNT was

recoded into three categories: low searchers (evaluated 1 house), medium searchers (evaluated 2, 3, or 4 houses), and high searchers (evaluated 5 houses), and order effects were tested using a chi-square test for independence.

Table 13 contains the results of the analyses for non-monotonic order effects. The MANOVA was not significant for order effects on evaluation of chosen alternative, satisfaction, and buyer-seller relationship (Hotellings = .11,  $F = .74$ ,  $p = .62$ ), and none of the univariate tests were significant either. The covariates (initial price reference point and initial quality reference point) were also not significant.

There were, however, effects of order on choice. Somer's D test indicated that the subjects in the non-monotonic and ascending orders chose lower price/quality alternatives than the descending order (Median: Non-monotonic = 3.5, Descending = 5.0, Somer's D = .30,  $p < .05$ ; Median: Ascending = 4.0, Descending = 5.0, Somer's D = .27,  $p < .1$ ). Choice was not significantly different between the non-monotonic and ascending orders (Median: Non-monotonic = 3.5, Ascending = 4.0, Somer's D = .06,  $p > .1$ ).

Hypotheses 1c is supported; presenting alternatives in a descending order produces choices that are higher in price and quality than when those alternatives are presented in an ascending order or a non-monotonic order. Hypotheses 1a, 1b, and 3a were not supported in this reduced design; order did not affect evaluation of the chosen alternative, search length, or satisfaction. Presentation order also had no effect on the buyer's perceptions of the buyer-seller relationship. However, for the observed effect size (.05) and small sample size ( $n=47$ ), the power of the MANOVA testing for those effects was

very low (.28). Therefore, conclusions about lack of order effects on evaluation of alternative, satisfaction, and buyer-seller relationship are tentative. These effects will be further analyzed in the larger design which drops the non-monotonic order but includes outlier conditions (n=109).

### *Effects on Search Length*

Hypothesis 1b predicts that search length will be longer for an ascending series than for a descending series. In an ascending series, subjects get reinforced for search by finding alternatives that are higher in quality.<sup>5</sup> In a descending series, there is no reinforcement for continued search and, in fact, alternatives actually get worse in terms of quality. No formal hypothesis was presented for outlier effects on search length but because the choice set is larger in the outlier conditions, search is expected to be longer.

A general factorial ANOVA with initial reference points as covariates tested for order and outlier effects on search length. The results, which support Hypothesis 1b, are presented in Table 14. The overall model was significant ( $F_{(7, 108)} = 2.79$ ,  $p = .01$ , adj.  $r^2 = .10$ ); there were no interactions of order with outliers, both order ( $F_{(1, 101)} = 5.37$ ,  $p = .02$ ) and initial reference points (PRICE:  $t = -2.07$ ,  $p = .04$ ; QUALITY:  $t = -1.69$ ,  $p = .09$ ) were significant predictors of amount of search. As predicted, subjects in an ascending order searched longer than those in the descending order (MEANS: Ascending = 4.68,

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<sup>5</sup> As discussed earlier, this increase in quality is accompanied by an increase in price. However, it is theorized that there is a differential reaction to changes in quality and price. Reference points for quality will adapt quickly to higher levels of quality but less quickly to lower levels of quality. Reference points for price are more adaptable in a negative direction. Thus, people will adapt to higher prices before they will adapt to lower quality.

Descending = 4.12). Also, as expected, outliers resulted in longer search (MEANS: No = 3.93, Extreme = 4.58, Moderate = 4.63,  $F_{(2, 101)} = 3.40$ ,  $p = .04$ ) but there was no difference in search length between the Moderate and Extreme Outlier conditions.

Interestingly, higher initial reference points resulted in less search. At first glance, this is contrary to Meyer's finding (Meyer, 1982; Phipps and Meyer, 1984) that people with lower initial reference points searched less because they were more likely to find an acceptable alternative relatively quickly. People with higher initial reference points were less likely to find an alternative that met or exceeded their expectations so they searched longer. However, in Meyer's work the initial reference point was determined by the first evaluated alternative. In this study, subjects had initial reference points prior to evaluating any alternatives. Furthermore, in this study the initial price reference point determined which price level of homes subjects evaluated. Subjects with higher initial price reference points evaluated homes that were better in quality than those that subjects with lower initial price reference points evaluated.

An analysis of initial reference points across price levels of alternatives revealed that although both price and quality initial reference points significantly varied across price levels (ANOVA: Price -  $F_{(4,120)} = 121.77$ ,  $p < .0001$ ; Quality -  $F_{(4,120)} = 7.22$ ,  $p < .0001$ ), initial price reference points were significantly different between each price level, but initial quality reference points were not (Table 15). Initial quality reference points were only significantly different between the highest price level and the lowest three price levels and between the second highest price level and the lowest price level. This indicates that

subjects in the lower price levels may have had optimistic expectations about what kind of attributes they could get for the price they were willing to pay. If quality expectations are relatively equal across the lower price levels, but the actual quality of homes varies, then subjects in the lower price levels may search longer because their quality expectations are less likely to be met or exceeded. Thus, shorter search for subjects with higher initial price reference points would be predicted for this design and is not inconsistent with Meyer's findings.

In summary, the effects of order and outliers on search length are as predicted. Hypothesis 1b is supported; an ascending order or presentation produces longer search than a descending order. Although not formally hypothesized, as expected, adding an alternative to a choice set increases search length.

### *Effects on Choice*

Hypothesis 1c predicts that an ascending order will result in a lower price-quality choice than a descending order. Hypotheses 2b predicts that a moderate outlier will result in a higher price-quality choice and 2d predicts that an extreme outlier will not affect choice.

It is interesting to note that, regardless of any other effects on choice, most subjects chose alternatives of relatively high price and quality. Seventy-two of the 125 subjects (58%) chose either alternative #4 or #5 (Table 16). Only two of the 50 subjects (4%) in descending order chose an alternative lower than #3 while 17 of the 59 subjects



(29%) in ascending order chose alternatives lower than #3. Furthermore, no subjects in the ascending order chose an outlier while 7 subjects (14%) in the descending order did.

Somer's D tests for differences in outcomes for ordinal data and was used to test for effects of order and outliers on choice. Outlier effects were tested for ascending and descending orders separately to identify any order and outlier interactions, and then main effects for order and outlier effects were tested.

Table 17 shows the distribution of choice across order and outlier conditions. The first three columns show choices across outliers in the ascending condition; the next three columns show choices across outlier conditions in the descending condition. Table 18 displays the results Somer's D tests and shows that there was an interaction between order and outliers. In the descending order, a moderate outlier produces choices with higher price and quality than either no outlier or an extreme outlier (Somer's D = .30,  $t = 2.46$ ,  $p < .01$ , thus supporting Hypotheses 2b and 2d. However, in the ascending order, both moderate and extreme outliers produced choices with *lower* price and quality than no outliers (Somer's D = -.19,  $t = -1.61$ ,  $p < .1$ ), opposite of predictions of Hypotheses 2b and 2d.

One plausible explanation for this effect is that the ascending order contained 16 low search subjects who actually saw no outlier. Dropping the 16 subjects from the analysis biases the ascending outlier condition toward longer search and potentially higher quality choices. However, even with this bias, the results remain the same (Somer's D = -.20,  $t = -1.50$ ,  $p < .1$ ).

Another possible explanation is that in the ascending condition, people may have been more price conscious or scrutinized price-quality tradeoffs more carefully than those in the descending order. There was no *a priori* reason that subjects randomly assigned to the ascending condition would have been more price conscious, but differences in price consciousness were tested using income and price level of evaluated homes as price consciousness indicators, assuming that people with lower incomes or buying lower priced homes may be more price conscious. There were no significant differences in income level between respondents in the ascending and descending orders (ANOVA:  $F_{(1,108)} = 1.57$ ,  $p = .21$ ) or between the three outlier conditions in the ascending order (ANOVA:  $F_{(2,56)} = .44$ ,  $p = .64$ ). For price level of evaluated homes, there were no significant differences between the three outlier conditions in the ascending order (Chi-square = 2.5,  $df = 4$ ,  $p = .64$ ), but there were for the descending order (Chi-square = 10.15,  $df = 4$ ,  $p = .04$ ). More subjects in the Descending, No Outlier condition were in the highest price level. However, for those subjects in the descending order, price level of evaluated houses was independent of choice (Chi-square = 8.3,  $df = 8$ ,  $p = .40$ ), so it is unlikely that price consciousness, as measured by price level of the evaluated houses, is affecting their choice.

There is also no indication that people in the ascending order were more careful searchers than those in the descending order. The percentage of subjects who looked at all the houses before making a choice and asked to review the houses was virtually the same between the two orders (Ascending = 36%, Descending = 36%). However, within

the ascending order, there was a significant difference in the number of people who asked to review the houses across outlier conditions (No = 12%, Extreme = 64%, Moderate = 83%). The same pattern existed in the descending order, but the differences weren't as large (No = 29%, Extreme = 37%, Moderate = 43%). It appears that seeing an outlier prompted more review of previously evaluated houses which may have then resulted in choices of lower price and quality in the ascending order and choices of higher price and quality in the descending condition.

Two questions for future research are, then, 1) why do people evaluating alternatives in an ascending order review previously evaluated alternatives more than people in a descending order and, 2) why do outliers in an ascending order have the opposite effect of outliers in a descending order. It is possible that presentation order may change the focus of search. A number of researchers have found that losses loom larger than gains (Tversky and Kahnemann, 1981, 1991; Payne, Laughhunn, and Crum, 1980). If subjects focused on the attribute that was getting worse in relation to their reference points, then perhaps quality was more important for subjects in the descending condition and price more important in the ascending condition, thus affecting the price-quality tradeoffs they were willing to make. This effect, however, is speculative and should be examined in future research.

In addition to this interaction, as shown in Table 18, there were still significant main effects for order on choice Somer's  $D = .57$ ,  $t = 6.83$ ,  $p < .001$ ) with subjects in the descending order choosing alternatives with higher price and quality than those in the

ascending order (MEDIANS: Descending = 5.0, Ascending = 3.0). Thus, Hypothesis 1c is supported. There were no main effects of outliers on choice (Somer's  $D = -.04$ ,  $t = -.40$ ,  $p > .1$ ). Thus, Hypotheses 2b and 2d are supported only in the descending order.

It is possible that this order effect on choice may be caused by low-searching subjects. If people quit searching after only two or three alternatives, then subjects in the descending order will be making a choice from the higher quality alternatives, while those in the ascending order will be making a choice from the lower quality alternatives. However, the order effect on choice remains even when low search subjects are dropped from the analysis. For subjects who searched five or six alternatives before choosing, those in the descending order still had significantly higher choices than those in the ascending order (MEDIANS: Descending = 5, Ascending = 4, Somer's  $D = .303$ ,  $t = 2.42$ ,  $p < .02$ ). Therefore, the difference in choice between ascending and descending orders does appear to be caused by the order condition.

In summary, the descending order produces choices of higher price and quality than the ascending order, supporting Hypothesis 1c. Moderate outliers in the descending order increase this effect, supporting Hypotheses 2b and 2d for the descending order. Outliers in the ascending order produce choices of lower price and quality than when no outliers are evaluated, contrary to predictions of Hypotheses 2b and 2d. However, Hypotheses 2b and 2d were predicated upon quality being more important than price in the choice decision. If the ascending order results in price being more important than

quality, then the lower price/quality choice for moderate outliers in the ascending condition would be consistent with reference point effects.

### *Effects on Evaluation of Alternatives*

Order and outliers are expected to affect how subjects evaluate specific alternatives. Subjects made five evaluations of their chosen alternative:

1. Considering features, quality, and price this alternative is (undesirable/desirable).
2. Considering features, quality, and price this alternative is (poor/excellent).
3. Considering features and quality only this alternative is (unattractive/attractive).
4. Considering price only, this alternative is (unattractive/attractive).
5. Rate this alternative on a scale of 1 to 100 (Worst House Ever/Best House Ever).

Table 19, Parts 1 - 8, shows the means of the combined, standardized score for each chosen alternative. Parts 1 - 6 show the mean evaluations of chosen alternative for all subjects in the ascending and descending orders. Parts 7 and 8 show the mean evaluations of chosen alternative for Choices #4 and #5 when the 16 subjects who didn't actually see the outlier are dropped from the ascending, outlier conditions.

The hypotheses predict effects on evaluation for a chosen alternative. To compare evaluations of a chosen alternative, comparisons should be made for each choice within each price level. However, there were not enough subjects who chose the same alternative in each price level to test the hypotheses in that manner. Because the initial price reference point was what determined the price level of homes the subject evaluated, subjects who chose the same alternative were combined across price levels and the initial reference points were used as covariates in a general factorial ANOVA. This still resulted

in only two analyses (Choices #4 and #5) that had enough subjects in each cell for interpretable ANOVAs, and even those results must be interpreted with caution because the cell sizes are small. There were significant effects for Choice #4, but not for Choice #5 (Table 20, Rows 1 and 2).

The model for Choice #4 was significant ( $F_{(7,22)} = 2.69, p = .05$ ), as was the order by outlier interaction ( $F_{(2,15)} = 2.79, p = .09$ ), outliers ( $F_{(2,15)} = 3.24, p = .07$ ), and the initial price reference point covariate ( $t = 1.80, p = .09$ ). However, the effects were not as predicted. The interaction was that there was no difference in evaluations among the outlier conditions in the ascending order, but there was in the descending order. The evaluations were lower in the Extreme Outlier than in the Moderate Outlier (MEANS: Extreme Outlier =  $-.10$ , Moderate Outlier =  $.81, p = .09$ ) and approached significance between the No Outlier and Moderate Outlier (MEANS: No Outlier =  $-.04$ , Moderate Outlier =  $.81, p = .13$ ). There was no support for Hypothesis 1a, which predicted main effects for order, and results were opposite for Hypothesis 2a which predicted lower evaluations in the Moderate Outlier condition. Hypothesis 2c predicted no difference between Extreme and No Outlier conditions and was supported.

The model for Choice #5 was not significant ( $F(7,40) = .62, p = .74$ ) but it did not have homogeneous error variances (Cochran's  $C(6,6) = .55, p = .002$ ). Transforming the data did not result in equal variances and an examination of the data revealed that the variance for the Extreme Outlier condition was smaller than the other two outlier conditions. If the Extreme Outliers were dropped from the analysis, error variances were

homogeneous (Cochran's  $C(5,4) = .35, p = .87$ ), but the model was still not significant ( $F(5,24) = .90, p = .50$ ).

It is possible that the lack of predicted outlier effects in the ascending order may have been caused by including the 16 subjects in the outlier conditions who never actually saw an outlier. The analyses for Choices #4 and #5 were rerun dropping these 16 subjects from the outlier conditions. The only major difference in results (Table 20, Rows 3 and 4) is that the Outlier by Order interaction becomes non-significant for Choice #4. The other results are consistent with the previous analyses. As predicted by H1c, the Extreme Outlier and No Outlier conditions are equal. However, contrary to H2a, evaluations of chosen alternatives in the Moderate Outlier condition are better than in the No Outlier and Extreme Outlier conditions, although the significance level is marginal ( $p = .11$ ). This effect is opposite to predictions.

One explanation for the higher evaluations in the Moderate Outlier conditions is that, contrary to the assumptions for this domain, price is more important than quality. If that is the case, then after evaluating the moderate outlier, lower price/quality choices would appear more attractive in terms of price and less attractive in terms of quality. An analysis was done using the standardized scores for the quality-only evaluation item (# 3 above) and the price-only evaluation item (#4 above). If price were more important than quality, then evaluating the moderate outlier should raise both the price and quality reference points and cause quality evaluations of the choice to be lower and price evaluations of the choice 4 to be higher than when no outlier was evaluated. These

analyses were run for both Choice #4 and #5, only Choice #4 had any significant differences. For the quality-only item, the model was significant ( $F_{(7,22)} = 3.05, p = .03$ ), and so were the interaction, order, outlier, and covariate effects (Table 20, Row 5). However, the direction of the results was the same; quality evaluations of Choice #4 in the Moderate Outlier conditions were higher than those in the No Outlier conditions. For the price-only item, the model was not significant (Table 20, Row 6). Therefore, it does not seem likely that price being more important than quality explains the higher evaluations of Choice #4 in the Moderate Outlier conditions.

To summarize, order did not affect evaluation of alternatives; Hypothesis 1a was not supported. Moderate Outliers did affect evaluation, but the effect was opposite of that predicted by Hypotheses 2a. Moderate Outliers resulted in higher evaluations than No Outliers. Hypothesis 2c was supported, Extreme Outliers had no effect on evaluation of alternatives. However, these results must be interpreted with caution. Evaluations could only be analyzed for two choices, and those both had small cell sizes. Therefore, it is unclear whether the lack of support for Hypotheses 1a and 2a is the result of small cell sizes or some other theoretical explanation of evaluation effects. Future research should investigate order and outlier effects on evaluations using stronger outlier manipulations and a larger sample to ensure that all possible choices have sufficient cell sizes to provide the power to detect significant differences.



### *Effects on Buyer-Seller Relationship*

Hypothesis 2e predicts that buyers' perceptions of the buyer-seller relationship will be lower when extreme outliers are presented because the buyer may make negative attributions about the seller's motivation for showing the extreme outlier. The overall buyer-seller relationship was measured using an 8-item scale shown in Appendix C, Parts C and D. Means for relationship quality across order and outlier conditions are shown in the top part of Table 21. A general factorial ANOVA assessed the effects of order and outliers on buyer-seller relationship. Initial price and quality reference points were included as covariates.

The model was significant ( $F_{(7,108)} = 1.93, p = .07$ ) as shown in Table 22, Row 1, but only order had significant effects on buyer's perceptions of buyer-seller relationship quality. Subjects in the ascending order had higher perceptions of the buyer-seller relationship than those in the descending order (MEANS: Ascending = 64.0, Descending = 56.1,  $F_{(1,101)} = 10.69, p = .001$ ). Apparently, presenting alternatives in an order where each subsequent alternative has better quality causes the buyer to perceive the seller more positively than when each subsequent alternative has worse quality.

Contrary to predictions, presenting outliers had no effect on perceptions of buyer-seller relationship quality, however, the means for both outlier conditions were lower and the significance level is close to typical rejection levels (MEANS: No Outlier = 63.0, Extreme Outlier = 58.6, Moderate Outlier = 59.9;  $F_{(2,101)} = 1.99, p = .14$ ). This may have

been the result of a weak test of outliers by including subjects in the ascending order who never saw an outlier. The analysis was also run dropping these 16 subjects from the data. As shown in Table 22, Row 2, the model was not significant ( $F_{(7,92)} = 1.36, p = .23$ ), nor were outlier main effects ( $F_{(2,85)} = 1.54, p = .22$ ). Thus, Hypothesis 2e is not supported.

This absence of outlier effects may have several explanations. One might be that buyers expect sellers to try to get them to 'buy up' and, therefore, don't perceive the inclusion of an outlier as something out of the ordinary during a sales presentation. Another is that the explanation the hypothetical real estate agent gave for showing the outlier (to educate the buyer about what is in the market) may have been plausible enough that the outlier didn't affect the buyer-seller relationship quality.

Although not hypothesized, order did significantly affect buyer-seller relationship quality ( $F_{(1,85)} = 5.07, p = .03$ ). Buyers perceived a more positive relationship when alternatives were presented in an ascending, rather than descending, order.

In summary, Hypothesis 2e is not supported, outliers had no effect on the buyer's perceptions of the buyer-seller relationship. However, an ascending presentation order resulted in better perceptions of relationship quality than a descending order.

### *Effects on Satisfaction*

Satisfaction with choice was also of interest to this research because of its implications for future purchases. The null hypotheses predicted no effects of order (Hypothesis 3a) and outliers (Hypothesis 3b) on satisfaction with choice. Satisfaction

with choice is a six-item scale as shown in Appendix C, Part B. The means of satisfaction across order and outlier conditions are shown in the lower half of Table 21. The effects of order and outliers were tested in a general factorial ANOVA that included initial price and quality reference points as covariates. The initial price reference point was included because it determined which price level of the homes a subject evaluated. Higher price level homes in this study have higher absolute levels of quality which should result in greater satisfaction. The results shown in Table 22, Row 3 reveal an order by outlier interaction and a significant initial price reference point covariate. As expected, subjects choosing from higher price, higher quality homes were more satisfied with their choice than subjects choosing from lower priced homes (Beta coefficient = .21,  $t = 2.03$ ,  $p = .05$ ).

Post-hoc contrasts revealed that the interaction effect is that there is no order effect on satisfaction in the No Outlier (MEANS: Descending = 49.5, Ascending = 52.3,  $t = .66$ ,  $p = .52$ ) and Moderate Outlier (MEANS: Descending = 56.5, Ascending = 51.5,  $t = -1.63$ ,  $p = .12$ ) conditions, but satisfaction was better in the Descending, Extreme Outlier condition than in the Ascending, Extreme Outlier condition (MEANS: Descending = 53.7, Ascending = 46.2,  $t = -2.06$ ,  $p = .05$ ). This effect remained when the 16 subjects in the ascending, outlier conditions who didn't search long enough to see the outlier were dropped from the analysis (Table 22, Row 4), so it is not simply a function of some subjects in the ascending condition not seeing the outlier.

As discussed earlier, the descending, moderate outlier condition produced choices of higher price/quality configuration. Therefore, the order/outlier interaction for

satisfaction might be a reflection of higher price/quality choices. The ANOVA was rerun including choice as a covariate and entering covariate effects first. This model was also significant ( $F_{(8,100)} = 1.98, p = .06$ ), and both choice ( $F_{(1,100)} = 5.10, p = .03$ ) and the initial price reference point ( $F_{(1,100)} = 4.66, p = .03$ ) were significant and the original effects disappear. Therefore, it appears that the order and outlier interaction effect on satisfaction is the result of different choices in those conditions. It should be noted, though, that the model does not explain very much of the variation in satisfaction (adjusted  $r^2 = .07$ ).

In summary, order and outliers do not appear to affect the buyer's satisfaction, except through the price/quality configuration of choice, which is affected by a order/outlier interaction. In general, the results indicate that satisfaction is primarily a function of the level of price/quality configuration of choice.

### **Summary of Direct Effects**

Hypotheses predicting direct effects of order of presentation on choice and search length were supported. Choices made from alternative sets presented in a descending order have higher price/quality configurations than those made from sets presented in ascending order. Search is longer when alternative sets are presented in ascending order than when they are presented in descending order. There were no effects of order on evaluation of alternatives. Therefore, Hypothesis 1a is not supported, but Hypotheses 1b and 1c are supported.

Hypotheses predicting direct effects of outliers on choice were partially supported, there was a significant interaction between outliers and order. Adding outliers to an alternative set in a descending condition resulted in choices with higher price/quality configurations, but the effect was reversed (lower price/quality choices) for ascending orders. Hypotheses predicting outlier effects on buyer-seller relationship quality were not supported, but there was an unhypothesized order effect; subjects evaluating alternatives in descending orders had worse perceptions of the buyer-seller relationship than those who evaluated alternatives in ascending orders.

Having shown that there are direct effects between the independent and dependent variables, the next step is to test for the mediating relationship of final reference points. The next section contains that discussion.

### **Reference Point Adaptation as a Mediating Variable**

The procedure for identifying mediating relationships described by Baron and Kenny (1986) was followed. The first step in this procedure is to show that the independent variable(s) has/have a significant effect on the mediating variables, final reference points. However, I first examine whether final reference points differed from the initial reference points.

Table 23 shows the means for initial and final reference points, as well as the means for reference point change, by order and outlier conditions. The upper portion of

the table contains the means for the price reference points, the lower portion contains those for the quality reference point.

Overall, respondents' price reference points dropped by 1.2% (PRICE: MEANS: Initial = \$136,091, Final = \$134,402,  $t = -1.67$ ,  $p = .10$ ) and quality reference points dropped by 2.4% (QUALITY: MEANS: Initial = 327.56, Final = 319.63,  $t = -2.50$ ,  $p = .01$ ). For both price and quality reference points, the final reference points were significantly lower than the initial reference points. Thus, it appeared that small changes in the initial reference points did occur. The smaller changes in price reference points may be attributed to the fact that the stimuli prices were centered around initial price reference points while the initial quality expectations appeared to be higher than the stimuli quality levels. The next step in identifying a mediating relationship is to show that order and outliers had significant effects on final reference points.

Two ANOVAs tested for order and outlier effects on final reference points, one for price and the other for quality. Both included the initial reference points as a covariate. The ANOVA models were significant (PRICE:  $F_{(6,108)} = 265.07$ ,  $p < .001$ ; QUALITY:  $F_{(6,108)} = 38.45$ ,  $p < .001$ ), but in both cases, the only the significant factor was the initial reference point (Table 24). One explanation for this lack of effects is that reference point adaptation does not mediate order and outlier effects on evaluation of alternatives, search length, and choice. However, most of the direct effects predicted by reference point theory did occur and there may be other reasons for lack of effects on final reference points. The most likely is a problem with the quality reference point measure.

As discussed earlier, the quality reference point measure understated changes in quality reference points. Some houses were described by desirable attributes that were not measured and, occasionally, a measured attribute was removed from the descriptions of the better quality homes. This happened when house descriptions were modified to ensure distinctive quality differences between alternatives. Computer screen space limitations precluded listing every possible attribute for each description and questionnaire time considerations precluded measuring every possible attributes. Thus, the final quality reference point measure does not encompass all of the attributes involved in the manipulation and may not adequately reflect the actual final quality expectations. There is no corresponding problem with the final price reference point, however, and that wasn't significantly affected by order or outliers either.

An alternate explanation for lack of order and outlier effects on final reference points is that the chosen alternative determined the final price and quality expectations. Table 25 presents the results of ANOVAs that tested for choice effects on final reference points with initial reference points as covariates; both models were significant. The top half contains the results for the price reference points analysis and shows that choice was a significant factor in predicting final price reference points (Choice:  $F(5,108) = 4.09$ ,  $p = .002$ ). This was not the case, however, for quality reference points which are shown in the lower half of Table 25 (Choice:  $F(5,108) = 1.73$ ,  $p = .14$ ). Therefore, choice determining final reference points is not a totally plausible alternate explanation of final reference point levels.

This measurement problem is critical with regard to identifying final reference points as mediating variables. Therefore, the mediating relationship for reference point adaptation can not be supported or refuted. Methods for correcting this problem are discussed in the next chapter.

### **Summary**

In summary, there were direct effects of presentation order on search length, choice, and the buyer's perception of the buyer-seller relationship. A descending order of presentation tends to result in shorter search, choices of higher price and quality, and worse perceptions of buyer-seller relationship quality than an ascending order, but had no effect on evaluations of the chosen alternative. Thus, Hypotheses 1b and 1c were supported, but not Hypothesis 1a.

There were no direct extreme outlier effects on evaluation of the chosen alternative, supporting Hypothesis 2c. There was an interaction between order and outliers for choice; evaluating outliers tended to produce choices with higher price and quality than when no outliers were evaluated, but only in the descending order. Thus, Hypotheses 2b and 2d were supported in the descending order condition. There were no significant effects of moderate outliers on evaluation or extreme outliers on the buyer-seller relationship. Thus, Hypotheses 2a and 2e were not supported.

Satisfaction was primarily a function of the price/quality configuration of the choice and not affected by either presentation order or outliers. Final reference points



could not be identified as mediating variables for order and outlier effects on evaluation of the chosen alternative, search length, and choice.

This chapter contained the results of the data analyses. I described the sample, measure and scale reliabilities, and manipulation checks, and then presented the results of hypothesis testing. Implications of these results are discussed in greater detail in the next chapter.

## **CHAPTER 5 DISCUSSION**

The previous chapters have described the foundations for the research, the methodology, and data analysis. This chapter draws conclusions from the data analysis in the preceding chapter and describes contributions and implications for the relevant theoretical, methodological, and substantive domains. Limitations of the research and suggestions for future research are presented within the discussion for each domain.

### **Theoretical Contributions**

This research makes several potential contributions to reference point theory. First, it proposed final reference points as mediating the effect of presentation order and outliers and search length, choice, and evaluation of the chosen alternative. It also suggested that the multiple reference points of price and quality may help better explain choice than a single reference point. Finally, it described primacy effects for choice in sequential search and clarified the influence of outlying alternatives on choice. The discussion of each of these contributions follows.

#### *Final Reference Point as Mediating Variable*

Previous research has shown that order and outliers affect reference points (Helson 1964, Della Bitta and Monroe 1974) and that reference points affect preference and choice (Rowe and Puto, 1987). This dissertation proposed that final reference points were a theoretical mediating variable for order and outlier effects on evaluation, search length, and choice. However, the study could not adequately test that hypothesis because of a

methodological problem in the measurement of the quality reference point. It should be noted, though, that the direct effects of the independent variables confirmed the predictions of reference point adaptation. For example, a descending order of presentation prompted choices of higher price/quality than an ascending or non-monotonic order. The theoretical explanation is that the higher price/quality alternative was evaluated first, anchored the reference point at a relatively high level, and subsequent alternatives were viewed as less attractive in quality. Choice, then, was made from the more attractive, higher price/quality alternatives.

Similarly, the effect of outliers in the descending order was that predicted by final reference points. Evaluating moderate outliers resulted in choices of higher price/quality than when there were no outliers or extreme outliers. In an ascending order, evaluating an outlier at the end of a series actually reduced the price/quality level of choice. The interaction between order and outliers indicates that the anchoring effect of the first evaluated alternative in an ordered series may vary with different orders of presentation. Why the outliers in the ascending series did not seem to raise the reference points for price and quality, resulting in higher choices than the no outlier conditions is perplexing. If the order changed the focus for choice to the attribute that was getting worse, then this interaction effect is consistent with reference point theory. However, it is tenuous at best to suggest that presentation order can completely change choice criteria and reverse price-quality importance, especially when its effects on search length are consistent with predictions based upon subjects' focus on quality.

Order effects on search length were consistent with final reference point effects. Evaluating alternatives in a descending order produces higher reference points for quality. Subsequent lower quality alternatives compare unfavorably to this reference point, therefore, search stops relatively quickly. In the ascending order, the quality reference point continues to adapt to higher levels of quality in the subsequent alternatives and search continues relatively longer.

Some predicted effects were either weak or not confirmed, including those of order and outlier effects on evaluation. If final reference points mediate these relationships, then evaluation of the chosen alternative should be higher when it is presented in an ascending order rather than a descending order. Unfortunately, the number of respondents was not adequate to provide strong evidence for or against this effect. Only four of the six possible ANOVAs had enough subjects to compare the two orders. One was non-significant and the other had effects opposite of predictions; the Extreme Outlier reduced evaluations of the chosen alternative in the descending condition, although it was predicted to have no effect. In addition, there were no main effects of presentation order, although those means were in the right direction (MEANS for Choice #4: Ascending .05, Descending = -.13).

The problems that inhibited identification of final reference points as mediating variables are correctable in future research. One correction is to simplify the reference point measurement by using fewer descriptive attributes and measure expectations for each one. Another is to simplify the choice task to eliminate multiple price levels. This would help ensure sufficient subjects for each evaluation cell. External validity

considerations prohibited applying these solutions in the home buying context of this study. Planned follow-up studies using a different choice context will seek to remedy these problems.

### *Multiple Reference Points*

A second theoretical contribution of this research is the use of multiple reference points in explaining choice and search behavior. The majority of previous research has used a single reference point (e.g., Biswas and Blair 1991, Blair and Landon 1981, Jacobson and Obermiller 1990) that is measured on one dimension. Putler (1992) did use two reference points, but both were price reference points; one served as an internal reference point based on historical prices, the other was an external reference point based upon store prices. Other research has shown that consumers have multidimensional expectations (Cadotte, Woodruff and Jenkins 1987, Tse and Wilton 1988, Mittal, Katrachis, Forkin and Konkel 1994) and can use multiple reference points (Corfman 1991).

The current study shows that multiple reference points can be measured and also provides evidence that different reference points may change independently of each other. The reference points that were measured in this study were quality attributes and price. Unfortunately, because of measurement problems, this study was not able to determine the relative influence of the price and quality reference points. Indications are, though, that future research regarding reference points must consider the multidimensional nature of

reference points and the independent effects of multiple reference points to more fully describe choice behavior.

### *Primacy/Recency Effects*

A third theoretical contribution of this research is the finding of primacy effects for sequential search. Previous research examining primacy/recency effects has generally used choice tasks with only two alternatives (Hovland 1957). The present task allowed the subjects to stop search when s/he found an acceptable alternative from among five or six options. The price/quality configuration of the first evaluated alternative appeared to anchor judgments and influence choice in accordance with Helson's (1964) adaptation level theory. When subjects saw the lowest price/quality alternative first, they tended to choose a lower price quality house than when they saw the highest price/quality alternative first. This effect was enhanced when the first alternative was a moderate outlier. While the data in this study could not confirm a mediating role for final reference points, the effects of order and outliers are consistent with its predictions.

Future research should further investigate adaptation with more accurate reference point measures and test alternative explanations for the primacy effect. One is the use of a specific number of better/worse comparisons as a stopping rule. For example, the stopping rule could be to compare the alternative to the best so far, if it's better, keep going. After evaluating some critical number of better options, the decision maker stops searching and picks the best one. If the next one is worse, however, the decision maker continues searching until either something better appears or some critical number of worse

alternatives are evaluated. What that critical stopping number might be is likely to be a function of individual, task, and context factors which warrant future investigation.

### *Compromise/Polarization Effects*

It is also interesting to compare choices in sequential search with those in simultaneous search. Simonson (1989) and Simonson and Tversky (1992) found compromise effects (middle alternative preferred) in simultaneous choice tasks when alternatives are described by two attributes other than price and quality. Polarization effects (higher quality alternative preferred) occurred when the alternatives were described by price and a single quality attribute.

Generally, in this study polarization occurred; people tended to choose the higher quality alternatives (MEDIAN=4). However, the polarization effect decreased as search lengthened. Of the 22 subjects who searched 2, 3, or 4 alternatives, 20 (91%) chose the highest quality alternative they evaluated. Of the 73 subjects who searched 5 or 6 alternatives, 18 (25%) chose the highest quality alternative. Simonson and Tversky (1992) explain polarization as the greater importance of quality relative to price. People who search longer may do so because for them, quality does not dominate price. They may search longer looking for high quality at a low price, and when they can't find it, choose a low price alternative, thus reducing the polarization effect. This study did not directly measure overall quality and price importance. However, people with lower incomes or buying less expensive houses may place more importance on price, so those variables were used as indicators of price importance. There was no significant difference

in income between people who searched different number of houses ( $F(4,90) = 1.92, p = .12$ ), and while there was for initial price reference point ( $F(4,90) = 3.20, p = .02$ ), the only group who had significantly higher initial price reference points are those who searched 3 alternatives. Therefore, it does not seem likely that relative quality importance can fully explain the reduced polarization effects either.

It appears that the domain of polarization effects need further examination. It may be that polarization effects only occur with smaller choice sets. However, Simonson, Nowlis, and Lemon (1993) found that the polarization effect disappeared when the three possible pairwise choices were made prior to choosing from a three alternative choice set. Because subjects made three choices from 2-alternative sets before choosing from the larger set, this task is somewhat similar to sequential search. Thus, there may be differential polarization effects between types of search tasks. Sequential search may induce a similar series of pairwise comparisons between the next alternative searched and the best so far. These issues needs further research because they have significant implications for marketers who are using comparative advertising and selecting the type of product attributes to describe.

### *Extreme Outliers*

The current research detected an outlier effect that is moderated by both the level of the outlier and the order of presentation. Moderate outliers increase the price/quality configuration of choice only when presented in a descending order. Outliers presented in an ascending order result in lower price/quality choice than when no outlier is evaluated.



Helson (1964) states that stimuli judged as outside the class for the reference point have no effect on reference point adaptation. Previous research has found outlier effects on reference prices even for prices configured as extreme outliers (e.g., Urbany, Bearden, and Weilbaker 1988). Biswas, Wilson, and Licata (1993) suggested that perhaps the outliers were not extreme enough and, therefore, still affected reference prices. This research indicates that their explanation may be partially correct.

Extreme outliers in this study were configured at 200% of the upper limit of the buyer's price range. Given the price levels of homes and the relative portion of one's income that is spent on a home, it is very unlikely that subjects would classify it as an affordable home. In the descending order, the extreme outlier was apparently discrepant enough in price (and also quality in this study) that it did not affect choice. However, the extreme outlier did influence choice in the ascending order. Why an identical outlier appears discrepant in one condition and not the other is perplexing. Apparently, when judging outliers, there is more going on than just discrepancy from the relevant category, and this issue should be explored in future research.

Researchers investigating reference points and outliers should consider what constitutes an extreme outlier for their specific research or choice domain. In this case, it was an alternative that was unlikely to be affordable and was atypically high in quality for the sample. For many other consumer products, such as grocery items, electronics, etc., making the outlier unaffordable may not be appropriate. When designing extreme outliers for specific products, researchers should carefully examine what determines the relevant category and consider how products may span multiple usage categories.

### *Limitations*

The major limitation of this research with respect to the theoretical contributions is the lack of an effective quality reference point measurement which precluded an adequate test of the mediating role of final reference points. While the effect patterns are consistent with reference point theory, this research cannot either support or disconfirm final reference points as the mediating factor.

### **Methodological Contributions**

A proposed methodological contribution of this study was the identification of possible methods of measuring multidimensional reference points and using two reference points to explain choice. The measures identified by this study were sensitive enough to detect changes in quality and price expectations; there were significant differences between the initial and final reference points for both quality and price. However, the multidimensional quality reference point was an incomplete measure and most likely understated the amount of change in quality expectations. This problem underscores the importance of precisely and completely identifying the relevant dimensions of quality reference points if any conclusions are to be made regarding their influence on choice processes.

### **Substantive Contributions**

The most significant findings of this research relate to substantive issues. Salespeople generally prefer buyers to choose alternatives that have relatively high prices and high margins, as long as the buyer is satisfied with the purchase and with the

salesperson. The data in this study indicate that the order in which a series of alternatives are evaluated affects choice from that series. If salespeople have the opportunity to select the order of presentation, these results imply an advantage to showing alternatives in a descending order of quality and price. This order tends to elicit a choice with a higher price/quality configuration than either an ascending or random order and is also more efficient; search is shorter in this condition. Apparently, when making a choice, buyers are less sensitive to increasing levels of price than to decreasing levels of quality and are more willing to trade low prices for higher quality when they evaluate high quality items first. There are no significant differences in choice between the ascending and random orders. Sellers may be able to prompt choices of higher price/quality with a descending order, but they must also be concerned with the effects of order on the buyer's satisfaction and perceptions of the buyer-seller relationship quality.

The descending order produced higher price/quality choices and satisfaction was greater with higher quality choices. However, the descending order also resulted in worse perceptions of the buyer-seller relationship. Thus, sellers are presented with a dilemma. Using a descending order of presentation to sell a higher priced alternative may result in fewer follow-up sales with that customer, even though the buyer's satisfaction with his/her choice is high. To the extent that an actual salesperson could manage the buyer-seller relationship, this effect may be attenuated. Thus, two questions become, why does this effect occur and what can the salesperson do to control it?

Lower perceptions of relationship quality in the descending order may be because buyers are attuned to potential sales tactics that may cause them to buy high priced

alternatives and may think that being shown the highest price item first is one of those tactics. The use of these kinds of tactics may indicate to the buyer that the salesperson places more importance on personal gain than on satisfying the buyer. In fact, an examination of the relationship quality scale items revealed that the biggest differences between the ascending and descending orders were for the two items that referred indirectly to sales tactics: “Susan Brown and I are in competition, she is trying to sell me an expensive house and I am trying to avoid buying it.” and “Some people, including Susan Brown, are not above ‘bending the facts’ to create the impression they want.”

Interestingly, even though buyers in the descending order may have thought that sales tactics were being used on them, they still chose higher priced alternatives and were more satisfied with those choices. Future research should explore the kinds of explanations for presenting a descending order of price and quality that would maintain high price/quality choices and satisfaction while improving the buyer’s perceptions of the relationship quality.

Showing outliers also affects choice. Presenting a moderate outlier is another method by which sellers can increase the price/quality configuration of the selected alternative, but only when alternatives are shown in a descending order. Moderate outliers at the beginning of a descending price/quality series tend to produce choices of higher price and quality than when no outlier is shown. If sellers are primarily interested in selling higher-priced alternatives, they can show a moderately higher price/quality option prior to showing the remaining alternatives in a descending series. However, there are several caveats to showing outliers.

First, this outlier effect only occurs when the alternatives are shown in a descending order. Showing an outlier at the end of an ascending series actually lowers the price/quality of choice. Again, the source of this shift and the generalizability of the outlier effect are questions for future research.

### *Limitations*

This study used a computerized program to present a home purchase choice task and subsequent questionnaire to actual home buyers. The purchase task in this study lacked the visual imagery and emotional impact typical of most home purchases and personal interactions with salespeople. Therefore, the generalizability to actual home purchases and other personal selling domains is unknown. The results of this study may be more generalizable to purchasing on the Internet, an increasingly popular shopping method. However, the Internet is replete with graphics and visual stimuli. Thus, the effects of graphics and visual stimuli on the order and outlier effects found in this choice task is another area for future research.

Another potential limitation is that search was limited to five (six in the outlier conditions) alternatives. For a decision as important as purchasing a house, this number may be low. However, this research is consistent with previous studies that indicate people don't search much (Roberts 1989), even for important decisions (Gronhaug and Troye 1983, Ostlund 1973), and that consideration set sizes typically range from three to eight, with a mean of about four.

## **Future Research Questions**

This study has raised several issues which deserve future exploration. The first is a re-examination of the effects of quality and price reference points using a simpler choice task and fewer quality attributes. While this study found effects consistent with reference points, the complexity of the home buying choice task made it difficult to develop a quality reference point measure that reflected a large portion of the reference point change. Furthermore, designing stimuli for five different price levels resulted in insufficient subjects to adequately test for effects on evaluation of the chosen alternative. Using a simpler choice task may remedy these problems and help to determine whether reference points mediate the effects that were found in this study.

A second interesting issue is why outliers had different effects in descending and ascending orders and actually reduced the price-quality choice. Also, subjects in the ascending order who saw outliers asked to review the alternatives more than those in the descending order. If this effect is generalizable, the question becomes whether it is a function of reference points, the result of a change in focus for choice, or some other, as yet unidentified, choice phenomenon.

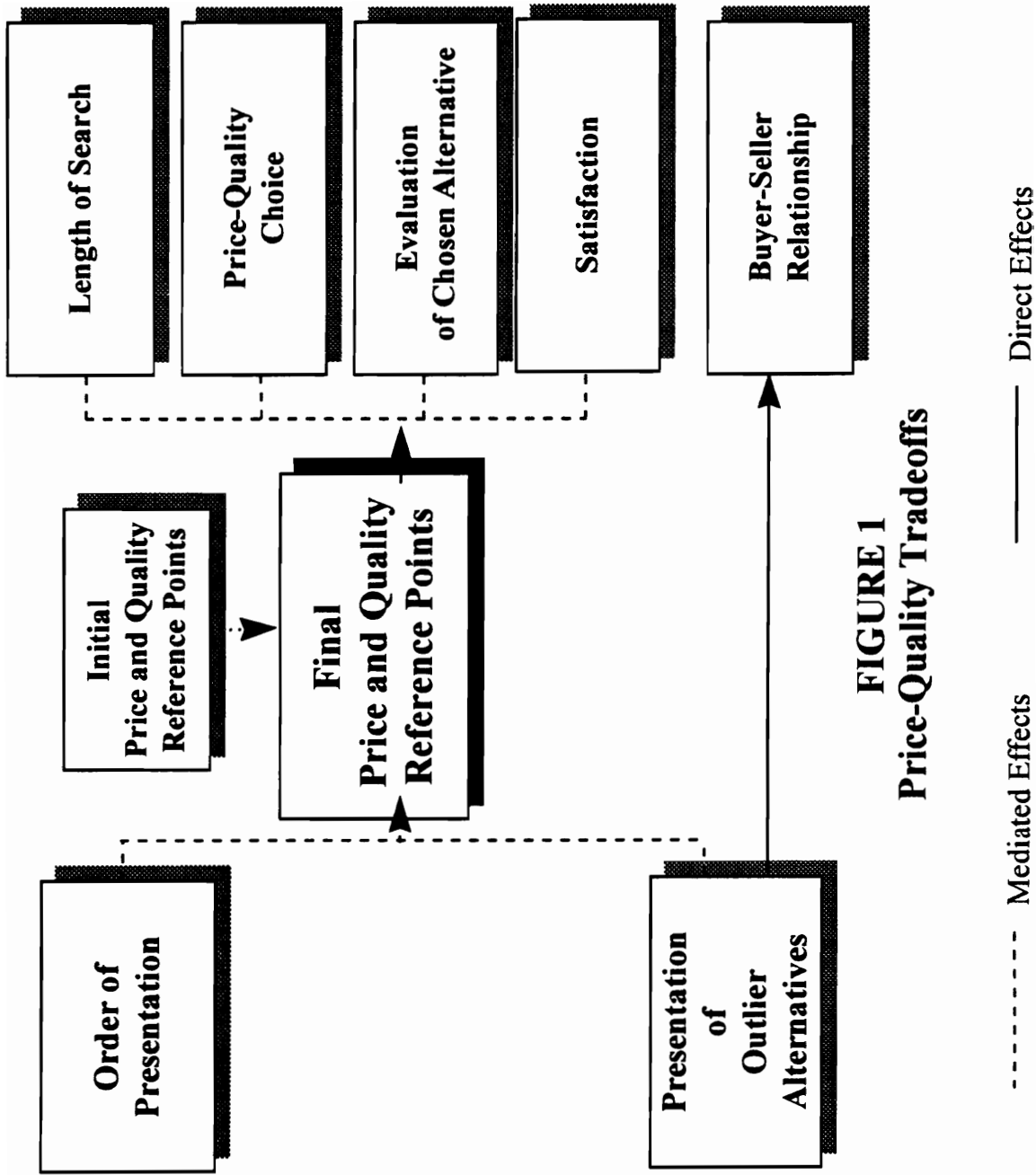
A third area for future research is to explore what the most effective methods are for using presentation order to produce high price/quality choices and satisfaction but reducing the order's negative effect on buyer's perception of relationship quality. Finally, the extent to which and the reasons why sequential search reduces polarization effects should be pursued in future studies.

## **Summary**

This research has examined the effect of order of presentation on final reference points, evaluation, search length, and choice. Methodological problems prevented any conclusions about the mediating role of final reference points, but order does affect search length and choice. As predicted, a descending order of quality tended to prompt choices that had higher levels of price/quality than both ascending and random orders. No effects of order on evaluation of the chosen alternative were found.

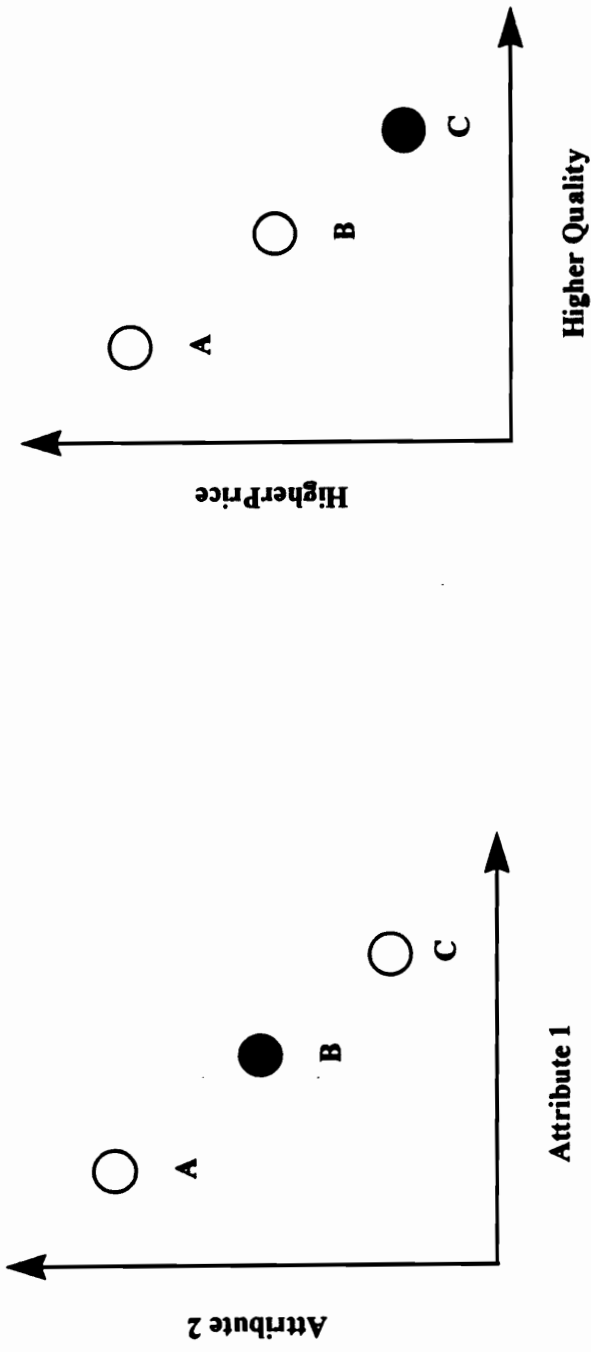
The effects of presenting outliers on choice, satisfaction, and relationship quality were also investigated. Moderate outliers in a descending order resulted in choices of higher price and quality than when no outliers or when extreme outliers were presented. However, that descending order also reduced the buyer's perceptions of the buyer-seller relationship. Outliers presented in an ascending condition produced choices with lower price and quality than when no outliers were presented. Satisfaction was primarily a function of the price/quality level of the chosen alternative, thus order and outliers only affected satisfaction through choice.

In summary, while the inability to identify final reference point adaptation as a mediating variable in this research is a disappointment, there are significant substantive findings with respect to order and outliers for search length, choice, buyer's perceptions of the buyer-seller relationship, and satisfaction. These findings should help sellers select a presentation strategy that will help them meet their sales objectives. In addition, this study has identified a number of issues relating to reference points that will provide direction for future research.



**FIGURE 1**  
**Price-Quality Tradeoffs**





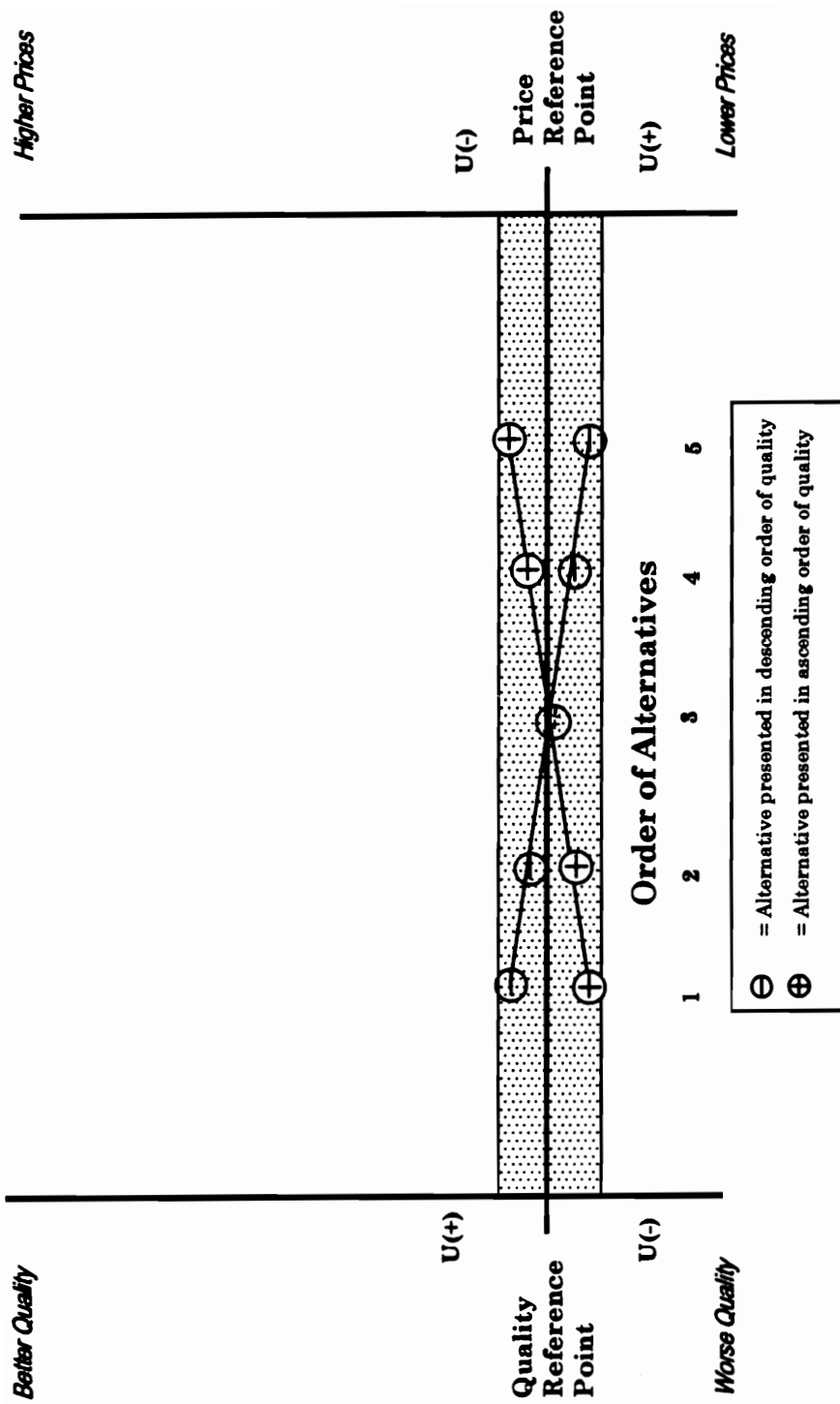
Attribute 1

Higher Quality

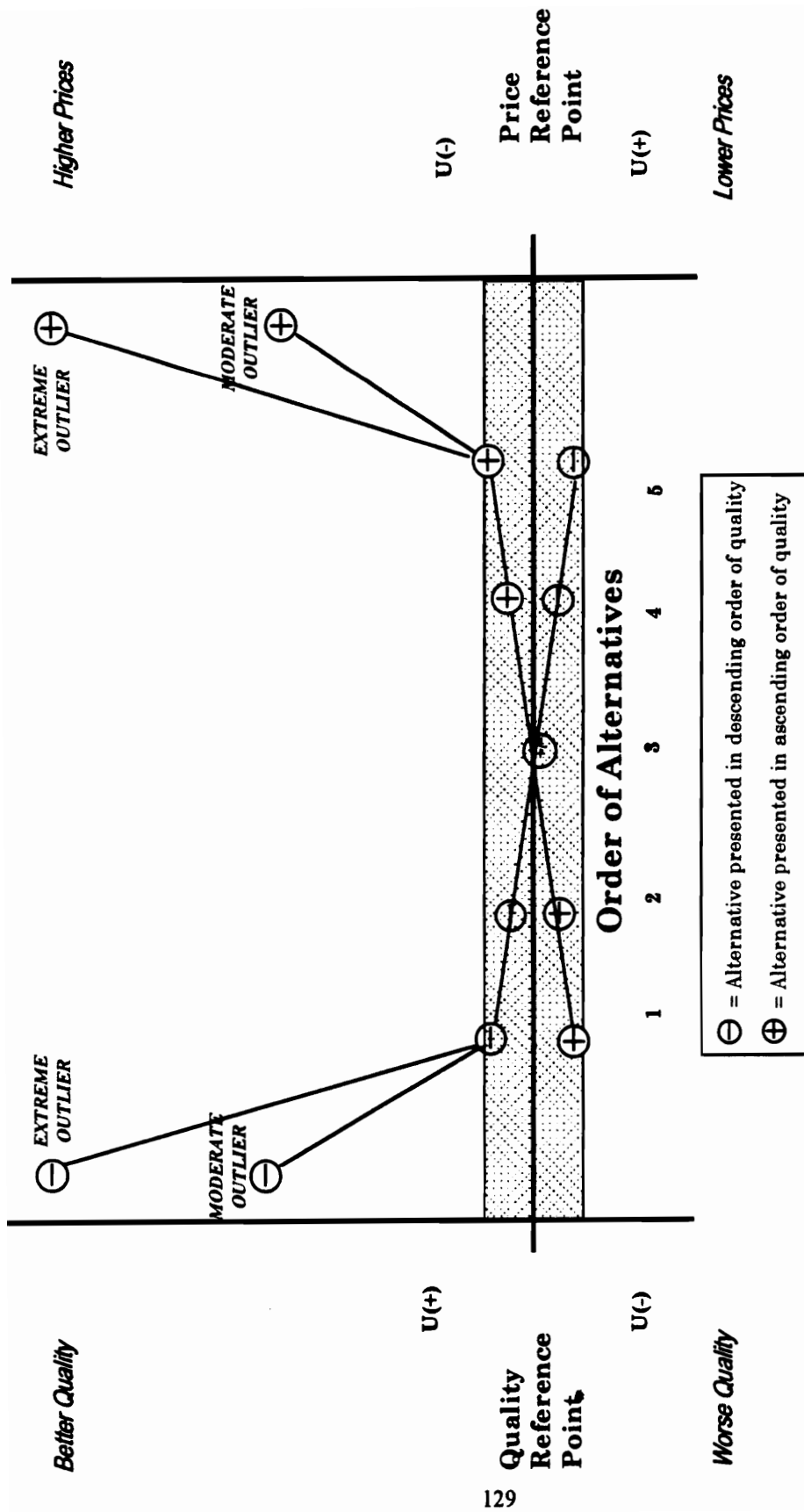
2-a  
Compromise Effect

2-b  
Polarization Effect

**FIGURE 2  
COMPROMISE AND POLARIZATION EFFECTS**



**FIGURE 3**  
**Order of Presentation**  
**in Expected Market**



**FIGURE 4**  
**Outlying Alternatives**  
**in Expected Markets**

Order of Presentation

	<u>Presentation of Outlying Alternatives</u>	Ascending Trend of Quality	Descending Trend of Quality	Non-monotonic Order
No Outlier				
Moderate Outlier				
Extreme Outlier				

**FIGURE 5**  
**Research Design**

# TABLE 1

## RESEARCH HYPOTHESES

### *Effects of Order Of Presentation*

- H1a: Alternatives will be more favorably evaluated when presented in an ascending order of price and quality than in a descending order.
- H1b: Search length will be longer for an ascending series of price and quality than for a descending series.
- H1c: Choice will be of lower price and quality in an ascending series than in a descending series.

### *Effects of Outlying Alternatives*

- H2a: Evaluation of a specific alternative will be lower when a moderately higher outlier is included in the choice set than when it is not.
- H2b: Choice will be of higher price and quality when a moderately high price-quality outlier is included in the choice set than when it is not.
- H2c: The evaluation of a specific alternative will not be affected when an extremely high price-quality outlier is included in the choice set.
- H2d: The choice from a set of alternatives will be not affected when an extremely high price-quality outlier is included in the choice set.
- H2e: Buyers' perceptions of the buyer-seller relationship quality will be lower when extreme outliers are presented than when moderate outliers or no outliers are presented.

### *Satisfaction with Choice*

- H3a: Order of presentation of alternatives will not affect a buyer's satisfaction with his/her choice.
- H3b: Presenting outlier alternatives will not affect a buyer's satisfaction with his/her choice

### *Mediating Role of Reference Point Adaptation*

- H4a: Final reference points mediate the relationship between order of presentation and evaluation of alternatives, price/quality choice, and search length.
- H4b: Final reference points mediate the relationship between presentation of outlier alternatives and evaluation of alternatives and price/quality choice.

**TABLE 2**  
**ORIGIN OF SUBJECTS**

<b>SOURCE</b>	<b>NUMBER</b>	<b>PERCENTAGE</b>
Aurora Beacon News	23	18.4
DeKalb Chronicle	33	26.4
Northern Today (NIU)	22	17.6
Rockford Register Star	29	23.2
Subject Referrals	15	12.0
Flyers at Realtors	3	2.4

**TABLE 3**  
**DISTRIBUTION OF SUBJECTS ACROSS**  
**EXPERIMENTAL CONDITIONS**

**ORIGINAL MANIPULATION:** Random assignment to groups.

	<u>ASCENDING</u> <u>ORDER</u>		<u>DESCENDING</u> <u>ORDER</u>		<u>NON-</u> <u>MONOTONIC</u>		<u>TOTAL</u>	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
No Outlier	17	29	17	34	16	100	50	40
Moderate Outlier	20	34	14	28			34	27
Extreme Outlier	<u>22</u>	<u>37</u>	<u>19</u>	<u>38</u>			<u>41</u>	<u>33</u>
TOTAL	59	100	50	100	16	100	125	100

**REASSIGNMENT:** Subjects in the ascending, outlier conditions who didn't search long enough to see the outlier are reassigned to the ascending, no outlier condition.

	<u>ASCENDING</u> <u>ORDER</u>		<u>DESCENDING</u> <u>ORDER</u>		<u>NON-</u> <u>MONOTONIC</u>		<u>TOTAL</u>	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
No Outlier	33	56	17	34	16	100	66	53
Moderate Outlier	12	20	14	28			26	21
Extreme Outlier	<u>14</u>	<u>24</u>	<u>19</u>	<u>38</u>			<u>33</u>	<u>26</u>
TOTAL	59	100	50	100	16	100	125	100

**DROPPED FROM ANALYSIS:** Subjects in the ascending, outlier conditions who didn't search long enough to see the outlier are dropped from the analysis.

	<u>ASCENDING</u> <u>ORDER</u>		<u>DESCENDING</u> <u>ORDER</u>		<u>NON-</u> <u>MONOTONIC</u>		<u>TOTAL</u>	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
No Outlier	17	40	17	34	16	100	50	46
Moderate Outlier	12	28	14	28			26	24
Extreme Outlier	<u>14</u>	<u>32</u>	<u>19</u>	<u>38</u>			<u>33</u>	<u>30</u>
TOTAL	43	100	50	100	16	100	109	100

**TABLE 4**  
**COMPARISON OF DESIRABILITY AND IMPORTANCE RATINGS**

	<u>Upper Median - Importance Ratings</u>	<u>Lower Median - Importance Ratings</u>	<u>t-value</u>	<u>p-value</u>
<b><u>Yes/No Attributes (14)</u></b>				
Mean Desirability Rating	17.32	14.46	5.52	<.001
<b><u>Attributes with Different Levels (9)</u></b>				
Mean Desirability Range	14.96	11.61	2.35	<.05



**TABLE 5  
ADDED ALTERNATIVE DESCRIPTORS**

	\$50,000 - \$69,999	\$70,000 - \$89,999	\$90,000 - \$119,999	\$120,000 - \$149,999	\$150,000 - \$200,000
<b>HOUSE #1</b>			Paddle fans	Paddle fans Exceptionally clean Move right in	Paddle fans Some views Lots of space everywhere
<b>HOUSE #2</b>		Good starter home	Paddle fans Good view from deck	Paddle fans Good views Low maintenance home	Paddle fans Like new inside & out Big kitchen Plenty of windows & light Great floor plan
<b>HOUSE #3</b>		Low maintenance exterior	Paddle fans Newer appliances Low maintenance home	Paddle fans Fantastic fireplace Lots of extras everywhere	Paddle fans Impressive stone fireplace Super views from all rooms Big center island kitchen
<b>HOUSE #4</b>	Convenient location Paddle fans	Convenient location Paddle fans Nice corner lot	Paddle fans Bright, airy rooms Walk-in closets Freshly painted inside and out	Paddle fans Long views Spacious rooms All top of the line appliances	Paddle fans Spacious rooms Top grade appliances Fantastic long-range views master bedroom on main floor
<b>HOUSE #5</b>	Convenient location Paddle fans	Convenient location Paddle fans Freshly painted inside and out	Paddle fans Bright, airy rooms Nice corner lot Very low maintenance interior and exterior	Paddle fans Super view Spacious rooms Tiled foyer Too many features to mention - a must see	Paddle fans Wonderful view Spacious rooms Walk-in closets Big eat-in kitchen Meticulously kept many special touches Master bedroom on first floor A dream house
<b>HOUSE #6 (Moderate Outlier)</b>	Convenient location Paddle fans Walk-in closets	Convenient location Paddle fans Spacious closets Low maintenance home	Paddle fans Walk-in closets Bright, airy rooms Move-in condition Fantastic views in all directions	Paddle fans Skylights Spacious rooms Tiled foyer Impressive open foyer Special touches everywhere This is a dream of a house	Paddle fans Balcony Spacious rooms Spectacular view Walk-in closets Pantry, Decorator touches Unique master bedroom on main floor with Jacuzzi Wiring for home office

**TABLE 6**

**PAIRED T- TESTS FOR DIFFERENCES IN DESIRABILITY BETWEEN ADJACENT ALTERNATIVES WITHIN PRICE LEVELS**

PRICE LEVEL	House #1 vs. House #2		House #2 vs. House #3		House #3 vs. House #4		House #4 vs. House #5		House #5 vs. Moderate Outlier		Moderate Outlier vs. Extreme Outlier	
	Means	t-value p-value	Means	t-value p-value	Means	t-value p-value	Means	t-value p-value	Means	t-value p-value	Means	t-value p-value
\$50,000 - 69,999 (n=6)	88.67 107.67	12.10 .000	107.67 146.33	11.60 .000	146.33 151.67	2.70 .086	151.67 168.17	9.66 .000	168.17 203.17	17.80 .000	203.17 271.83	11.32 .000
\$70,000 - 89,999 (n=10)	116.10 141.30	10.41 .000	141.30 172.40	15.62 .000	172.40 179.00	2.88 .036	179.00 195.10	10.67 .000	195.10 211.90	14.11 .000	211.90 258.80	10.52 .000
\$90,000 - 119,999 (n=28)	116.57 133.29	24.57 .000	133.29 177.54	13.84 .000	177.54 177.34	†	177.54 195.86	14.84 .000	195.86 195.86	†	195.86 269.43	17.60 .000
\$120,000 - 149,999 (n=39)	171.03 210.00	29.93 .000	210.00 217.31	4.50 .000	217.31 233.92	11.17 .000	233.92 252.87	10.83 .000	252.87 236.62	-19.68†† .000	236.62 269.62	23.41 .000
\$150,000 + (n=42)	215.60 218.17	2.76 .018	218.17 218.17	†	218.17 242.36	12.24 .000	242.36 261.07	39.07 .000	261.87 258.17	-3.11†† .006	258.17 276.31	11.33 .000

† No difference in desirability between alternatives  
 †† Desirability ratings in wrong direction

Note 1: These ratings are computed from the 20 attributes whose configurations did not vary across subjects. The configuration of bedrooms, bathrooms, and garage for each house was a function of the individual subject's expectations and, as such, varied across subjects. Those three attributes are not included in these desirability computations.

**TABLE 7****SAMPLE DEMOGRAPHICS**

ITEM	SAMPLE		POPULATION*	
	Number	Percent		
GENDER	Male	62	49.6	48.6%
	Female	63	50.4	51.4%
AVG HH SIZE	3.2		3.23 (Family)	1.34 (Non-family)
AVG INCOME	\$52,449		\$51,951	
MARITAL STATUS	Single	19	15.2	53.3%
	Married	96	77.4	
	Divorced	8	6.5	
	Widowed	1	.8	
EDUCATION	High School	7	5.6	35.3%
	Some college	42	33.9	26.1%
	Undergrad degree	22	17.7	13.2%
	Some grad work	16	12.9	N/A
	Masters	23	18.5	4.4%
	Professional	14	11.3	1.9%
AVG AFFORDABLE HOME	\$135,000		\$135,500 (Married)	\$121,500 (All)

\*Source: Assorted 1990, 1993 U.S Census tables

**TABLE 8****PRETEST CONSTRUCT MEASURE RELIABILITIES**

<u>CONSTRUCT</u>	<u>COEFFICIENT <math>\alpha</math></u>
<b>Certainty (n=26)</b>	
How certain are you of getting X <sup>1</sup> condition?	.91
How certain are you that your new house will have a workshop?	.30
Expected a Workshop (n=10)	.92
Did Not Expect a Workshop (n=16)	-.25
<b>Importance (n=26)</b>	
In your purchase of a new house, how important is the type of basement?	.94
In your purchase of a new house, how important is it to have a family room?	.93
<b>Desirability (n=26)</b>	
How desirable would it be to have a dining room?	.92
How desirable would it be to have a fireplace?	.98

<sup>1</sup> X refers to the level of the attribute that the subject expected to get in the home purchase. For example, if the subject reported that s/he expected to buy a house in very good condition, s/he was asked, 'How certain are you that your new house will be in very good condition?'

**TABLE 9**  
**SCALE RELIABILITIES**

<u>SCALE, SOURCE</u>	<u>NUMBER OF ITEMS</u>	<u>CRONBACH'S ALPHA</u>		
		<u>ORIGINAL PUBLISHED SOURCE</u>	<u>PRETEST (n=29)</u>	<u>TEST (n=124)</u>
	12	.76	.96	
Relationship Quality: Crosby, Evans, Cowles (1990)				
Satisfaction Dimension	3	.99	.91	
Reduced Set (Items #2, #3)	*2		.95	
Trust Dimension	9	.89	.94	
Reduced Set (Items #5, #6, #8, #10)	*4		.93	
Anticipation of Future Interaction: Developed	*2		.88	
<b>FINAL RELATIONSHIP QUALITY SCALE</b>	8		.96	.91
Satisfaction with Choice Outcome: Oliver (1980)	6	.82	.86	
Reduced Set: (Items #3, #4, #5)	*3		.83	
Satisfaction with Choice: Developed	*3		.74	
<b>FINAL SATISFACTION SCALE</b>	6		.86	.91

\*Items in Final Scale

**TABLE 10**  
**MANIPULATION CHECKS: FOR OUTLIER**  
**MANIPULATIONS**

ITEM	MEANS <sup>1</sup>	F-RATIO n=124	Significance Level	eta <sup>2</sup>
Houses were what I expected	No Outlier = 4.83 Moderate Outlier = 4.46 Extreme Outlier = 4.45	.84	.43	.01
I was surprised at some of the houses	No Outlier = 3.69 Moderate Outlier = 4.69† Extreme Outlier = 5.39†	10.22	<.001	.14
There weren't many differences between the houses	No Outlier = 4.20* Moderate Outlier = 4.04* Extreme Outlier = 2.79‡	8.25	<.001	.12

<sup>1</sup> 1=Strongly Disagree, 7=Strongly Agree

\*Not significantly different from scale midpoint ( $\alpha=.10$ )

† Significantly different than No Outlier

‡ Significantly different than No Outlier and Moderate Outlier

**TABLE 11**

**SUBJECTS NOTICING ORDER OF PRESENTATION**

	NOTICED ANY ORDER						TOTAL <u>WRONG</u>
	YES			NO			
	<u>Correct</u>	<u>Wrong</u>		<u>Correct</u>	<u>Wrong</u>		
Ascending	37	7	0	15	37	22	
Non-monotonic	1	6	8	0	9	6	
Descending	30	8	0	12	30	20	
<b>TOTAL</b>	<u>n</u> 68	<u>n</u> 21	<u>n</u> 8	<u>n</u> 27	<u>n</u> 76	<u>n</u> 48	
	<u>%</u> 76	<u>%</u> 24	<u>%</u> 23	<u>%</u> 77	<u>%</u> 61	<u>%</u> 39	

**TABLE 12****MANIPULATION CHECKS: INVOLVEMENT AND VISUALIZATION**

	<u>ITEM</u>	<u>SCALE MIDPOINT</u>	<u>MEAN</u>	<u>T-VALUE</u>	<u>P-VALUE</u>
<b>INVOLVEMENT</b>	Interested in Task	6	8.82	15.67	<.001
	Took Task Seriously	6	9.28	19.29	<.001
<b>VISUALIZATION</b>	Of Houses	6	7.50	6.25	<.001
	Of Susan Brown	6	5.50	-2.08	<.005



**TABLE 13**

**COMPARISONS OF NON-MONOTONIC, ASCENDING,  
and DESCENDING ORDERS**

**MANOVA**

<u>DEPENDENT VARIABLE</u>	<u>TEST STATISTIC</u>			<u>Combined, Adjusted Means</u>
	<u>Significance Level</u>		<u>eta<sup>2</sup></u>	
Multivariate: Evaluation of Alternatives Satisfaction Buyer-Seller Relationship	F=.74	p=.62	.05	
Univariate: Evaluation of Alternatives	F=.38	p=.67	.02	Non-monotonic = .13 Ascending = .19 Descending = .14
Satisfaction	F=.54	p=.59	.02	Non-monotonic = 52.3 Ascending = 53.6 Descending = 49.3
Buyer-Seller Relationship	F=1.92	p=.16	.08	Non-monotonic = 64.9 Ascending = 68.5 Descending = 59.0

**Chi-Square**

			<u>MEDIANS</u>
Search Length: Low, Medium, High Searchers	3.44	p=.49	.03
			Non-monotonic = 3 Ascending = 3 Descending = 3

**Somer's D**

			<u>MEDIANS</u>
Choice	.21	p < .05	
Paired Comparisons:			Non-monotonic = 3.5 Ascending = 4.0 Descending = 5.0
Non-monotonic - Descending	.30	p < .05	
Non-monotonic - Ascending	.06	p > .1	
Descending - Ascending	.27	p < .1	

**TABLE 14****ANOVAs for ORDER AND OUTLIER EFFECTS  
ON SEARCH LENGTH**

	<b>F-VALUE (t-value for covariates)</b>	<b>p- VALUE</b>	<b>PARTIAL eta<sup>2</sup></b>	<b>MEANS</b>
<b>MODEL</b>	2.79	.01	.10	Ascending = 4.68 Descending = 4.12
<b>ORDER</b>	5.37	.02	.05	
<b>OUTLIER</b>	3.40	.04	.06	
<b>ORDER X OUTLIER</b>	1.45	.24	.03	No Outlier = 3.93
Covariate: <b>Price</b>	-2.07	.04	.04	Extreme Outlier = 4.58
<b>Quality</b>	-1.70	.09	.03	Moderate Outlier = 4.63

**TABLE 15**  
**DIFFERENCES IN INITIAL REFERENCE POINTS**  
**ACROSS PRICE LEVELS OF ALTERNATIVES**

<b>Initial Reference Point</b>	<b>F-value</b>	<b>p-value</b>	<b>Eta<sup>2</sup></b>	<b>Means</b>
Price	121.77	<.0001	.90	Price Level 1: \$ 60,083*
				Price Level 2: \$ 80,845*
				Price Level 3: \$104,518*
				Price Level 4: \$132,872*
				Price Level 5: \$182,488*
Quality	7.22	<.0001	.18	Price Level 1: 290.17
				Price Level 2: 270.90
				Price Level 3: 307.89
				Price Level 4: 330.49†
				Price Level 5: 353.14††

\* Significantly different from all other Price Levels

† Significantly different from Level 2

†† Significantly different from Levels 1, 2, and 3

**TABLE 16**  
**CHOSEN ALTERNATIVE BY ORDER and OUTLIER CONDITION**

	ORDER						OUTLIERS									
	Ascending		Non-monotonic		Descending		Order Total		No Outlier		Moderate Outlier		Extreme Outlier		Outlier Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<b>CHOICE #1</b> Lowest Price/Quality	8	14	2	13	2	4	12	10	4	8	3	9	5	12	12	10
<b>CHOICE #2</b> Second Lowest Price/Quality	9	15	1	6	0	0	10	8	2	4	3	9	5	12	10	8
<b>CHOICE #3</b> Middle Price/Quality	14	24	5	31	5	10	24	19	10	20	8	23	6	15	24	19
<b>CHOICE #4</b> Second Highest Price/Quality	15	25	1	6	8	16	24	19	10	20	5	15	9	22	24	19
<b>CHOICE #5</b> Highest Price/Quality	13	22	7	44	28	56	48	38	24	48	9	26	15	37	48	38
<b>CHOICE #6</b> Outlier	0	0	0	0	7	14	7	6	0	0	6	18	1	2	7	6
<b>TOTAL</b>	59	100	16	100	50	100	125	100	50	100	34	100	41	100	125	100

**TABLE 17**

**CHOSEN ALTERNATIVE BY OUTLIER CONDITIONS  
FOR ASCENDING AND DESCENDING ORDERS**

	ASCENDING (n=59)						DESCENDING (n=50)					
	No Outlier		Moderate Outlier		Extreme Outlier		No Outlier		Moderate Outlier		Extreme Outlier	
	n	%	n	%	n	%	n	%	n	%	n	%
<b>CHOICE 1</b>	2	12	2	12	4	18	0	0	1	7	1	5
<b>CHOICE 2</b>	1	6	3	15	5	23	0	0	0	0	1	5
<b>CHOICE 3</b>	1	6	8	40	5	23	4	24	0	0	1	5
<b>CHOICE 4</b>	7	41	4	20	4	18	2	12	1	7	5	26
<b>CHOICE 5</b>	6	35	3	15	4	18	11	64	6	43	11	58
<b>CHOICE 6</b>			0	0	0	0			6	43	1	5
<b>TOTAL</b>	17	100	20	100	22	100	17	100	14	100	19	100

**TABLE 18****ORDER and OUTLIER EFFECTS ON CHOICE**

<b><u>TESTED EFFECT</u></b>	<b><u>Somer's D:</u></b>	<b><u>n</u></b>	<b><u>t-VALUE</u></b>	<b><u>p - VALUE (One-tailed)</u></b>	<b><u>EFFECT</u></b>
<b>Interactions:</b>					
Outlier Effects in Descending Order	.30	50	2.46	< .01	Moderate > No Outlier Moderate > Extreme
Outlier Effects in Ascending Order	-.19	59	-1.61	< .1	No Outlier > Moderate No Outlier > Extreme
<b>Main Effects:</b>					
Order	.57	109	6.83	< .001	Descending > Ascending
Outlier	-.04	109	-.40	> .1	

**TABLE 19**  
**MEANS OF STANDARDIZED EVALUATION SCORE**  
**BY CHOICE ALTERNATIVE**

**PART 1: CHOICE #1**

	<b>Ascending</b>		<b>Descending</b>		<b>Outlier Mean</b>	
	Mean	n	Mean	n	Mean	n
<b>No Outlier</b>	-.11	2		0	-.11	2
<b>Extreme Outlier</b>	-.37	4	1.30	1	-.04	5
<b>Moderate Outlier</b>	<u>-.42</u>	<u>2</u>	<u>.70</u>	<u>1</u>	<u>-.04</u>	<u>3</u>
	-.32	8	1.00	2	-.05	10

**PART 2: CHOICE #2**

	<b>Ascending</b>		<b>Descending</b>		<b>Outlier Mean</b>	
	Mean	n	Mean	n	Mean	n
<b>No Outlier</b>	.49	1		0	.49	1
<b>Extreme Outlier</b>	-1.11	5		0	-1.11	5
<b>Moderate Outlier</b>	<u>.15</u>	<u>3</u>		<u>0</u>	<u>.15</u>	<u>3</u>
	-.51	9		0	-.51	9

**PART 3: CHOICE #3**

	<b>Ascending</b>		<b>Descending</b>		<b>Outlier Mean</b>	
	Mean	n	Mean	n	Mean	n
<b>No Outlier</b>	1.08	1	-.23	4	-.03	5
<b>Extreme Outlier</b>	-.34	5	.65	1	-.17	6
<b>Moderate Outlier</b>	<u>.11</u>	<u>8</u>		<u>0</u>	<u>.11</u>	<u>8</u>
	.01	14	-.05	5	.00	19

**PART 4: CHOICE #4**

	<b>Ascending</b>		<b>Descending</b>		<b>Outlier Mean</b>	
	Mean	n	Mean	n	Mean	n
<b>No Outlier</b>	-.26	7	.57	2	-.08	9
<b>Extreme Outlier</b>	.19	4	-.65	5	-.27	9
<b>Moderate Outlier</b>	<u>.45</u>	<u>4</u>	<u>1.02</u>	<u>1</u>	<u>.57</u>	<u>5</u>
	.05	15	-.13	8	-.01	23

**TABLE 19 - cont.**  
**MEANS OF STANDARDIZED EVALUATION SCORE**  
**BY CHOICE ALTERNATIVE**

**PART 5: CHOICE #5**

	<b>Ascending</b>		<b>Descending</b>		<b>Outlier Mean</b>	
	Mean	n	Mean	n	Mean	n
<b>No Outlier</b>	-.60	6	.26	11	-.04	17
<b>Extreme Outlier</b>	.39	4	.02	11	.12	15
<b>Moderate Outlier</b>	<u>.27</u>	<u>3</u>	<u>-.00</u>	<u>6</u>	<u>.09</u>	<u>9</u>
	-.10	13	.11	28	.05	41

**PART 6: CHOICE #6**

	<b>Ascending</b>		<b>Descending</b>		<b>Outlier Mean</b>	
	Mean	n	Mean	n	Mean	n
<b>Extreme Outlier</b>		0	-1.17	1	-1.17	1
<b>Moderate Outlier</b>		<u>0</u>	<u>.13</u>	<u>6</u>	<u>.13</u>	<u>6</u>
		0	-.05	7	-.05	7

Subjects who didn't see outlier in ascending, outlier condition are dropped from analysis.

**PART 7: CHOICE #4**

	<b>Ascending</b>		<b>Descending</b>		<b>Outlier Mean</b>	
	Mean	n	Mean	n	Mean	n
<b>No Outlier</b>	-.26	7	.57	2	-.08	9
<b>Extreme Outlier</b>	.33	3	-.65	5	-.28	8
<b>Moderate Outlier</b>	<u>.68</u>	<u>3</u>	<u>1.02</u>	<u>1</u>	<u>.77</u>	<u>4</u>
	.09	13	-.13	8	-.01	21

**PART 8: CHOICE #5**

	<b>Ascending</b>		<b>Descending</b>		<b>Outlier Mean</b>	
	Mean	n	Mean	n	Mean	n
<b>No Outlier</b>	-.60	6	.26	11	-.04	17
<b>Extreme Outlier</b>	.19	2	.02	11	.05	13
<b>Moderate Outlier</b>	<u>.67</u>	<u>2</u>	<u>-.00</u>	<u>6</u>	<u>.17</u>	<u>8</u>
	-.19	10	.11	28	.03	38



**TABLE 20**  
**ORDER AND OUTLIER EFFECTS ON EVALUATION OF**  
**CHOICES #4 AND #5**

	<b>F-VALUE</b> (t-values for covariates)	<b>p-VALUE</b>	<b>Partial eta<sup>2</sup></b>	<b>MEANS</b> (See Table 19)
<b>*CHOICE #4: Model</b>	2.69	.05	.39	Table 19, Part 4
Order	2.82	.11	.16	
Outlier	3.24	.07	.30	
Order X Outlier	2.79	.09	.27	
Covariates: Price	1.80	.09	.18	
Quality	1.59	.13	.14	
<b>*CHOICE #5: Model</b>	.84	.57	.09	Table 19, Part 5
Order	1.67	.21	.05	
Outlier	1.27	.30	.07	
Order X Outlier	1.54	.23	.09	
Covariates: Price	.35	.73	.004	
Quality	1.29	.21	.05	
<b>**CHOICE #4: Model</b>	2.62	.06	.40	Table 19, Part 7
Order	2.13	.17	.14	
Outlier	3.03	.08	.32	
Order X Outlier	2.31	.14	.26	
Covariates: Price	1.76	.10	.19	
Quality	1.44	.17	.14	
<b>**CHOICE #5: Model</b>	.92	.51	.11	Table 19, Part 8
Order	2.07	.16	.07	
Outlier	1.31	.29	.08	
Order X Outlier	1.78	.19	.11	
Covariates: Price	.46	.65	.01	
Quality	1.38	.18	.06	
<b>Evaluation of Quality Only Item</b>				
<b>**CHOICE #4: Model</b>	3.05	.03	.55	
Order	8.83	.01	.37	
Outlier	5.44	.02	.42	
Order X Outlier	4.48	.03	.37	
Covariates: Price	1.81	.09	.18	
Quality	2.77	.01	.34	
<b>Evaluation of Price Only Item</b>				
<b>**CHOICE #4: Model</b>	1.51	.24	.16	
Order	.13	.72	.01	
Outlier	1.71	.21	.19	
Order X Outlier	1.86	.19	.20	
Covariates: Price	1.63	.12	.15	
Quality	-.35	.73	.01	

\* All subjects in ascending and descending orders included.

\*\* 16 subjects who didn't see outlier in ascending order are dropped from analysis.

**TABLE 21**  
**MEANS FOR RELATIONSHIP QUALITY AND**  
**SATISFACTION**

n=109	<u>Ascending Order</u>	<u>Descending Order</u>	<u>Outlier Mean</u>
<b>Relationship Quality:</b>			
No Outlier	66.9	59.1	63.0
Extreme Outlier	62.5	54.2	58.6
Moderate Outlier	<u>63.2</u>	<u>55.3</u>	<u>59.9</u>
<b>Order Mean</b>	64.0	56.1	60.4

n=109	<u>Ascending Order</u>	<u>Descending Order</u>	<u>Outlier Mean</u>
<b>Satisfaction</b>			
No Outlier	52.2	49.5	50.9
Extreme Outlier	46.2	53.7	49.7
Moderate Outlier	<u>51.5</u>	<u>56.5</u>	<u>53.5</u>
<b>Order Mean</b>	49.7	53.1	51.3

**TABLE 22**  
**ANOVA RESULTS FOR SIGNIFICANT EFFECTS OF**  
**ORDER and OUTLIERS ON RELATIONSHIP QUALITY**  
**and SATISFACTION**

DEPENDENT VARIABLE	F-VALUE (t-value for covariates)	P-VALUE	PARTIAL ETA - SQUARED
Relationship Quality: Model	1.93	.07	.03
Order	10.69	.001	.10
Outliers	1.99	.14	.04
Order and Outliers	1.00	.37	.02
COV: Initial Price Reference Point	.29	.77	.001
COV: Initial Quality Reference Point	1.41	.16	.02
*Relationship Quality: Model	1.36	.23	.01
Order	5.07	.03	.06
Outliers	1.54	.22	.04
Order and Outliers	.33	.72	.01
COV: Initial Price Reference Point	.52	.60	.003
COV: Initial Quality Reference Point	.69	.49	.01
Satisfaction: Model	2.04	.06	.05
Order	2.32	.13	.02
Outliers	.78	.46	.02
Order and Outliers	2.59	.08	.04
COV: Initial Price Reference Point	2.03	.05	.001
COV: Initial Quality Reference Point	.23	.82	
*Satisfaction: Model	2.46	.02	.08
Order	1.76	.19	.02
Outliers	.89	.42	.02
Order and Outliers	2.75	.07	.06
COV: Initial Price Reference Point	2.66	.01	.08
COV: Initial Quality Reference Point	-.29	.77	.001

\*Dropping subjects who didn't actually see an outlier in the Ascending, Outlier conditions.

**TABLE 23**  
**MEAN REFERENCE POINT MEASURES BY ORDER AND**  
**OUTLIER CONDITION**

PRICE REFERENCE POINT	NO OUTLIER		EXTREME OUTLIER		MODERATE OUTLIER		ORDER MEAN	
	Ascending	Descending	Ascending	Descending	Ascending	Descending	Ascending	Descending
Initial Reference Point	133,691	146,441	128,795	122,826	147,550	139,536	136,564	135,534
Final Reference Point	131,053	144,911	125,988	123,931	145,050	137,929	133,909	134,984
Percent Change	-2.0	-1.0	-2.2	+9	-1.7	-1.2	-1.9	-4
<b>OUTLIER MEAN</b>								<b>GRAND MEAN*</b>
Initial Reference Point	140,066		126,029		144,250		136,091	
Final Reference Point	137,982		125,035		142,118		134,402	
Percent Change	-1.5		-8		-1.5			-1.2

QUALITY REFERENCE POINT	NO OUTLIER		EXTREME OUTLIER		MODERATE OUTLIER		ORDER MEAN	
	Ascending	Descending	Ascending	Descending	Ascending	Descending	Ascending	Descending
Initial Reference Point	341.82	329.53	327.05	297.11	335.90	338.07	334.31	319.60
Final Reference Point	331.88	310.29	318.09	297.26	328.20	336.64	325.49	312.72
Percent Change	-2.9	-5.8	-2.7	+1	-2.3	-4	-2.6	-2.2
<b>OUTLIER MEAN</b>								<b>GRAND MEAN**</b>
Initial Reference Point	335.68		313.17		336.79		327.56	
Final Reference Point	321.09		308.44		331.68		319.63	
Percent Change	-4.3		-1.5		-1.5			-2.4

\* t-value = -1.67, p = .10

\*\* t-value = -2.50, p = .01

**TABLE 24****ANOVAs FOR EFFECTS OF ORDER and OUTLIERS ON  
FINAL REFERENCE POINTS**

	<b>F-VALUE (t-value for covariates)</b>	<b>p-VALUE</b>	<b>PARTIAL ETA<sup>2</sup></b>
<b>Price (n=109)</b>			
<b>Model</b>	265.07	<.001	.94
<b>Order</b>	.96	.33	.01
<b>Outlier</b>	.22	.99	.00
<b>Order by Outlier</b>	.01	.80	.00
<b>COV: Initial Price Reference Point</b>	38.90	<.001	.94
<b>Quality (n=109)</b>			
<b>Model</b>	38.45	<.001	.68
<b>Order</b>	.00	.99	.00
<b>Outlier</b>	.86	.43	.02
<b>Order and Outlier</b>	.77	.46	.02
<b>COV: Initial Quality Reference Point</b>	14.58	<.001	.68

**TABLE 25****ANOVAs FOR CHOICE EFFECTS ON FINAL  
REFERENCE POINTS**

	<b>F-VALUE (t-value for covariates)</b>	<b>p-VALUE</b>	<b>PARTIAL ETA<sup>2</sup></b>
<b>Price (n=109)</b>			
Model	316.65	<.001	.95
Choice	4.09	.002	.17
COV: Initial Price Reference Point	42.78	<.001	.95
<b>Quality</b>			
Model	41.36	<.001	.71
Choice	1.73	.14	.08
COV: Initial Quality Reference Point	15.60	<.001	.71

# APPENDIX A

## Specification of Descriptive Attributes

***PART A: 24 Measured Attributes***

<u>Attribute</u>	<u>Type of Measure</u>
1. Price	Expected Price Range
<i>Critical Features:</i> Three features are used to match the buyer's expectations about the basic house elements. They are listed below with all possible levels of the feature.	
2. Bedrooms	Levels: 1, 2, 3, 4, 5, 6
3. Bathrooms	Levels: 1, 1 ½, 2, 2 ½, 3, 4
4. Garage	Levels: None, Carport, Single, Double

*Important but Negotiable Features:* These features are used to vary the quality of alternatives in each choice set. Some features have several levels of quality, others are either present or not present in the house. The type of measure for each is noted below.

5. Basement	Levels: Crawl Space, Partial, Full, Full-Finished, Full-Finished with Bath
6. Condition	Levels: Poor, Average, Good, Very Good, Excellent
7. Heating	Levels: Forced Air-Oil, Electric Baseboard, Heat Pump, Forced Air-Gas
8. Cooling	Levels: None, Window Units, Central Air, Heat Pump
9. Water	Levels: Well, Public
10. Sewer	Levels: Septic, Public
11. Smoke alarms	Yes/No
12. View	Yes/No*
13. Fireplace	Yes/No*
14. Appliances	Yes/No*
15. Workshop	Yes/No
16. Den/Office	Yes/No
17. Deck/Porch	Yes/No*
18. Eat-in-kitchen	Yes/No*
19. Dining room	Yes/No
20. Storm doors/windows	Yes/No*
21. Vaulted ceilings	Yes/No
22. Cable availability	Yes/No
23. Hot tub/Jacuzzi	Yes/No
24. Family room	Yes/No

\*For these six items, although expectations were measured on a Yes/No scale, the descriptions could include more information about the attribute to enhance the quality manipulation. That additional information is shown next.

## APPENDIX A

### Specification of Descriptive Attributes (cont.)

View:	View, Some views, Nice view, Good views, Good view from deck, Wonderful view, Super view, Super views from all rooms, Fantastic views in all directions, Fantastic long-range views, Spectacular view
Fireplace:	Fireplace, Fantastic fireplace, Stone fireplace, Impressive stone fireplace, 2 beautiful stone fireplaces
Appliances:	Range, refrigerator, dishwasher, washer/dryer, disposal, microwave, built-in microwave, trash compactor, water softener, newer appliances, all top of the line appliances, top-grade appliances
Deck/Porch:	Porch, Screened porch, Deck, Deck and Porch, Deck and Screened Porch, 2 decks, 2 porches - one with screens and storm windows
Eat-in-kitchen:	Eat-in-kitchen, Big eat-in kitchen, Big center island kitchen
Storm doors/windows:	Storm doors, Storm doors/windows, Insulated glass

***PART B: Other descriptive attributes***

These attributes are not measured as part of the quality reference point but are included in the alternative descriptions to add realism and to enhance the quality manipulation.

<u>Attribute</u>	<u>Descriptions</u>
------------------	---------------------

*Important but Negotiable Features*

Flooring	Vinyl, Hardwood, Wall-to-Wall Carpet, Carpet/Hardwood, Wall-to-Wall Carpet/Vinyl, Carpet/Vinyl/Hardwood, Carpet/Hardwood/Tile
Interior Features	Paddle Fan(s), Skylights, Walk-in Closets, Spacious closets, Pantry, Tiled Foyer, Impressive open foyer
Exterior Features	Balcony, Solar Panels, Satellite Dish, Nice corner lot, Convenient location, Landscaped yard, Guest house
Comments	Bright, Airy Rooms, Plenty of windows and light, Spacious rooms, Lots of space everywhere, Elec. Garage Door, Master bedroom on main Floor, Unique master bedroom on main floor with Jacuzzi, Wiring for home office, Many special touches, Special touches everywhere, Lots of extras everywhere, Decorator touches, Too many features to mention - a must see, Good starter home, This is a dream of a house, A dream house!, This is a stunning house, Great floor plan, Low maintenance exterior, Low maintenance home, Very low maintenance interior and exterior, Freshly painted inside and out, Exceptionally clean, Move right in, Move in condition



## **APPENDIX A**

### **Specification of Descriptive Attributes (cont.)**

*Less Important and Negotiable Features:* These features are used to provide increased realism to the descriptions of homes. Within a set of alternatives, they vary only by negligible amounts.

**Lot Size**                      Values range from .33 - 2.00 acres

**Square Footage**            Values range from 1196 - 3700 sq. ft.; Extreme Outlier has 4500 sq. ft.

**Age**

New	12 years
1 year	13 years
2 years	15 years
3 years	16 years
5 years	17 years
7 years	18 years
8 years	20 years
10 years	Over 20 years





**APPENDIX B**  
**Reference Point Measurement Protocol - cont.**

***Price Reference Point Measure***

Thinking about what you expect your new house to have in the way of features and quality, what price range do you expect to pay for this house?

I expect to pay between  
\$                      and \$  
for my new house.

## **APPENDIX C**

### **Measures**

**A) Evaluation of Alternatives:** Five items,  $\alpha = .84$ . (Items 1, 2, 3, and 4 are measured on an 11-point scale. Item 5 is measured on a 100 point scale.)

1. Considering features, quality, and price, this house is...  
Undesirable.....Desirable

2. Considering features, quality, and price, this house is...  
Poor.....Excellent

3. Without considering price, how would you rate this house for features and quality ?  
Unattractive..... Attractive

4. Without considering features or quality, how would you rate this house for price?  
Unattractive.....Attractive

5. On a scale of 1 to 100 where 1 is the worst house ever imaginable at an outrageous price, and 100 is your dream house at a very affordable price, where would you rate this house?

## APPENDIX C (Cont)

### Measures

**B) Satisfaction with Choice Outcome:** From Oliver (1980),  $\alpha=.82$ . Minor modifications were made in the wording of some of Oliver's items to reflect the real estate purchase situation. All six items were rated on an 11-point Strongly Disagree - Strongly Agree scale. Pretest reliability:  $\alpha = .86$ .

1. I am satisfied with my decision to choose this house.
- 2.\* If I had it to do all over again, I would feel differently about this house.
3. † My choice to buy this house was a wise one.
- 4.\*† I feel bad about my decision concerning this house.
5. † I think that I did the right thing when I decided to choose this house.
- 6.\* I am *not* happy that I did what I did concerning this house.

**Satisfaction with Choice:** Items were rated on an 11-point Strongly Disagree - Strongly Agree scale. Pretest reliability:  $\alpha = .74$ .

1. † I am satisfied with the house that I selected.
- 2.\*† I would be unhappy if I had to live in a house like the one that I chose.
3. † I would like to actually buy a house just like the one I picked.

\*Reverse-coded items.

†Items included in final satisfaction measure. Reliability for six items in final measure:  $\alpha = .91$ .

## APPENDIX C (Cont)

### Measures

- C) Relationship Quality Scale:** From Crosby, Evans, and Cowles, 1990,  $\alpha=.76$ . Minor modifications were made in the wording of some of Crosby, Evans and Cowles items to reflect the real estate purchase situation.

**Factor 1:** Satisfaction with salesperson.  $\alpha = .99$ , Semantic differential scale (1 - 7). Please indicate how you feel towards the salesperson.

1. Satisfied.....Dissatisfied
2. † Pleased.....Displeased
3. † Favorable.....Unfavorable

**Factor 2:** Trust in salesperson.  $\alpha = .89$ , Likert scale - Strongly agree (7) - Strongly disagree (1)

1. My agent can be relied upon to keep his/her promises.
2. \*† There are times when I find my agent to be a bit insincere.
3. \*† I find it necessary to be cautious in dealing with my real estate agent.
4. My agent is trustworthy.
5. \*† My agent and I are in competition - he/she is trying to sell me an expensive house and I am trying to avoid buying it.
6. My agent puts the customer's interests before his/her own.
7. \*† Some people, including my agent, are not above "bending the facts" to create the impression they want.
8. \* My agent is dishonest.
9. \* I suspect that my agent has sometimes withheld certain pieces of critical information that might have affected my decision-making.

\*Reverse-coded items.

†Items included in final relationship quality scale.

## APPENDIX C (Cont)

### Measures

**D) Anticipation of Future Interaction:** Developed measure. Pretest reliability:  $\alpha = .79$ . Items are rated on an 11-point Strongly Disagree-Strongly Agree scale.

1. † I would recommend Susan Brown to other people who are trying to buy a house.
2. † If I had to buy another house in this area, I would ask Susan Brown to serve as my agent again.

† These eight items (six from the Crosby, Evans, and Cowles scale and the two from the Anticipation of Future Interaction scale) were used as the final measure for relationship quality.  $\alpha = .91$ .

**E) Task Involvement:**

1. On a scale of 0 to 10, how interesting would you say this simulated home buying questionnaire was? (Scale: 0 [Not interesting at all] - 10 [Very interesting]; Mean = 8.8)
2. How seriously did you take the house purchase task in this computerized questionnaire? (Scale: 0 [Not seriously at all] - 10 [Very seriously]; Mean = 9.3)

**Task Visualization:** Scale 0 (Not very well at all) - 10 (Very well)

1. How well could you visualize the houses being described? (Mean = 7.5)
2. How well could you visualize Susan Brown as a person? (Mean = 5.5)

**Manipulation Check - Outliers:** Scale 0 (Strongly Disagree) - 10 (Strongly Agree)

1. The houses I saw in this program were similar to what I expected for this market. (Mean = 4.7)
2. I was surprised at some of the houses that Susan Brown showed me. (Mean = 4.4)
3. There weren't many differences between any of the houses that I saw. (Mean = 3.8)



**APPENDIX D**  
**Experimental Stimuli**  
**Price Level \$50,000 - \$69,999: Houses 1, 2, 3**

<b>PRICE LEVEL: \$50,000-\$69,999</b>	<b>QUALITY CONFIGURATION</b>		
<b>ATTRIBUTE</b>	<b>HOUSE #1</b>	<b>HOUSE #2</b>	<b>HOUSE #3</b>
<b>AGE</b>	12 yrs	18 yrs	16 yrs
<b>ACREAGE</b>	.76 acre	1 acre	.88 ac
<b>SQ FT</b>	1210	1196	1224
<b>FLOORING</b>	WWC/N	WWC/N	WWC/N
<b>CONDITION</b>	Average	Good	Good
<b>BASEMENT</b>	Crawl Space	Crawl Space	Crawl Space
<b>HEAT/COOL</b>	Forced air - oil/None	Forced air - oil/None	Elec. BB/None
<b>WATER/SEWER</b>	Well/Septic	Well/Septic	Well/Septic
<b>APPLIANCES</b>	Range	Range	Range, Ref.
<b>EXT. FEATURES</b>	Storm Doors	Storm Doors/Windows	Storm Doors/Windows
<b>INT. FEATURES</b>		Smoke Alarms	Smoke Alarms
<b>COMMENTS</b>			

# APPENDIX D

## Experimental Stimuli

### Price Level \$50,000 - \$69,999: Houses 4, 5, Moderate Outlier

PRICE LEVEL: \$50,000-\$69,999	QUALITY CONFIGURATION		
	HOUSE #4	HOUSE #5	MODERATE OUTLIER
ATTRIBUTE			
AGE	17 yrs	13 yrs	12 yrs
ACREAGE	.69 ac	.92 ac	1 ac
SQ FT	1200	1250	1275
FLOORING	WWC/V	WWC/V	WWC/V
CONDITION	Good	Good	Good
BASEMENT	Partial	Partial	Partial
HEAT/COOL	Elec. BB/None	Elec. BB/None	Elec. BB/None
WATER/SEWER	Well/Septic	Well/Septic	Well/Septic
APPLIANCES	Range, Ref., DW	Range, Ref., DW	Range, Ref., DW
EXT. FEATURES	Storm Doors/Windows	Storm Doors/Windows	Storm Doors/Windows
INT. FEATURES	Smoke Alarms Paddle Fans Cable	Deck Smoke Alarms Paddle Fans Cable Workshop	Deck, Porch Smoke Alarms Paddle Fans Eat-in kitchen Cable Walk-in closets Workshop
COMMENTS	View Convenient Location	View Convenient Location	View Convenient Location

# APPENDIX D

## Experimental Stimuli

### Price Level \$70,000 - \$89,999: Houses 1,2, 3

PRICE LEVEL: \$70,000-\$89,999	QUALITY CONFIGURATION		
ATTRIBUTE	HOUSE #1	HOUSE #2	HOUSE #3
AGE	12 yrs	15 yrs	13 yrs
ACREAGE	.88 ac	1.03 ac	1 ac
SQ FT	1810	1825	1800
FLOORING	WWC/V	WWC/V	WWC/V
CONDITION	Average	Good	Good
BASEMENT	Partial	Partial	Partial
HEAT/COOL	Forced air - elec/None	Forced air - elec/None	Heat Pump/None
WATER/SEWER	Public/Septic	Public/Septic	Public/Septic
APPLIANCES	Range, Ref	Range, Ref	Range, Ref., DW
EXT. FEATURES	Storm Doors/Windows	Storm Doors/Windows	Storm Doors/Windows
INT. FEATURES	Smoke Alarms Eat-in kitchen	Deck Smoke Alarms Eat-in kitchen	Deck Smoke Alarms Eat-in kitchen Workshop Cable
COMMENTS		Good starter home	Low maintenance exterior

**APPENDIX D**  
**Experimental Stimuli**  
**Price Level \$70,000 - \$89,999: Houses 4, 5, Moderate Outlier**

<b>PRICE LEVEL:</b> <b>\$70,000-\$89,999</b>	<b>QUALITY CONFIGURATION</b>		
<b>ATTRIBUTE</b>	<b>HOUSE #4</b>	<b>HOUSE #5</b>	<b>MODERATE OUTLIER</b>
<b>AGE</b>	12 yrs	13 yrs	15 yrs
<b>ACREAGE</b>	.96 ac	1.13 ac	1 ac
<b>SQ FT</b>	1850	1880	2000
<b>FLOORING</b>	WWC/V	WWC/V	WWC/V
<b>CONDITION</b>	Good	Good	Good
<b>BASEMENT</b>	Full	Full	Full
<b>HEAT/COOL</b>	Heat Pump/None	Heat Pump/None	Heat Pump/None
<b>WATER/SEWER</b>	Public/Septic	Public/Septic	Public/Septic
<b>APPLIANCES</b>	Range, Ref., DW, W/D	Range, Ref., DW, W/D	Range, Ref., DW, W/D
<b>EXT.</b>	Storm Doors/Windows	Storm Doors/Windows	Storm Doors/Windows
<b>FEATURES</b>	Deck	Deck, Porch	Deck, Porch
<b>INT. FEATURES</b>	Smoke Alarms Eat-in kitchen Workshop Paddle Fans Cable	Smoke Alarms Eat-in kitchen Workshop Paddle Fans Cable	Smoke Alarms Eat-in kitchen Workshop Paddle Fans Cable, Walk-in closets
<b>COMMENTS</b>	Convenient Location Nice corner lot	Convenient Location View	Convenient Location View, Low maintenance home

# APPENDIX D

## Experimental Stimuli

### Price Level \$90,000 - \$119,999: Houses 1, 2, 3

PRICE LEVEL: \$90,000-\$119,999	QUALITY CONFIGURATION		
ATTRIBUTE	HOUSE #1	HOUSE #2	HOUSE #3
AGE	7 yrs	10 yrs	8 yrs
ACREAGE	1 acre	1.39 acres	1.25 ac
SQ FT	2490	2470	2500
FLOORING	WWC//TILE	WWC//TILE	WWC//TILE
CONDITION	Good	Very Good	Very Good
BASEMENT	Partial	Partial	Partial
HEAT/COOL	Elec. BB/None	Elec. BB/None	HP/HP
WATER/SEWER	Public/Public	Public/Public	Pub/Pub
APPLIANCES	Range, Ref., Disposal	Range, Ref., Disposal	Range, Ref., Disp, DW
EXT. FEATURES	Insulated Glass	Insulated Glass	Insulated Glass
INT. FEATURES	Vaulted Ceilings Paddle Fans	Deck Vaulted Ceilings Paddle Fans	Deck Vaulted Ceilings Paddle Fans
COMMENTS	View	Good view from deck	View Newer Appliances Low Maintenance Home

**APPENDIX D**  
**Experimental Stimuli**  
**Price Level \$90,000 - \$119,999: Houses 4, 5, Moderate Outlier**

<b>PRICE LEVEL:</b> <b>\$90,000-\$119,999</b>	<b>QUALITY CONFIGURATION</b>		
<b>ATTRIBUTE</b>	<b>HOUSE #4</b>	<b>HOUSE #5</b>	<b>MODERATE OUTLIER</b>
<b>AGE</b>	10 yrs	5 yrs	5 yrs
<b>ACREAGE</b>	1.5 ac	1.33 ac	1.75 ac
<b>SQ FT</b>	2540	2525	2700
<b>FLOORING</b>	WWC/TILE	WWC/TILE	WWC/TILE
<b>CONDITION</b>	Very Good	Very Good	Very Good
<b>BASEMENT</b>	Partial	Full	Full
<b>HEAT/COOL</b>	HP/HP	HP/HP	HP/HP
<b>WATER/SEWER</b>	Public/Public	Public/Public	Public/Public
<b>APPLIANCES</b>	Range, Ref., Disp, DW, W/D	Range, Ref., DW, Disp, W/D	Range, Ref., DW, Disp, W/D
<b>EXT. FEATURES</b>	Insulated Glass Deck	Insulated Glass Deck	Insulated Glass Deck, Screened Porch
<b>INT. FEATURES</b>	Vaulted Ceilings Paddle Fans Fireplace, Cable Walk-in closets	Vaulted Ceilings Paddle Fans Fireplace, Cable Walk-in closets, Workshop View	Vaulted Ceilings Paddle Fans Fireplace, Cable Walk-in closets, Workshop Fantastic views in all directions
<b>COMMENTS</b>	Bright airy rooms Freshly painted inside and out	Bright airy rooms Freshly painted inside and out Nice corner lot, Very low maintenance int. and ext.	Bright airy rooms Freshly painted inside and out Move-in condition

**APPENDIX D**  
**Experimental Stimuli**  
**Price Level \$120,000 - \$149,999: Houses 1, 2, 3**

<b>PRICE LEVEL:</b> \$120,000- \$149,999	<b>QUALITY CONFIGURATION</b>		
<b>ATTRIBUTE</b>	<b>HOUSE #1</b>	<b>HOUSE #2</b>	<b>HOUSE #3</b>
<b>AGE</b>	7 yrs	10 yrs	8 yrs
<b>ACREAGE</b>	1.55 acre	1.42 acres	1.52 ac
<b>SQ FT</b>	2985	3010	3000
<b>FLOORING</b>	WWC/TILE	WWC/TILE	WWC/V/TILE
<b>CONDITION</b>	Good	Very Good	Very Good
<b>BASEMENT</b>	Full	Full	Full
<b>HEAT/COOL</b>	Elec. BB/Window Units	Elec. BB/Window Units	HP/HP
<b>WATER/SEWER</b>	Public/Public	Public/Public	Public/Public
<b>APPLIANCES</b>	Range, DW	Range, DW	Range, DW, Disposal
<b>EXT. FEATURES</b>	Storm Doors/Windows	Storm Doors/Windows	Storm Doors/Windows
<b>INT. FEATURES</b>	Paddle Fans Dining Room Family Room Smoke Alarms Cable	Deck Paddle Fans Dining Room Family Room Smoke Alarms Cable	Deck Paddle Fans Dining Room Family Room Smoke Alarms Cable
<b>COMMENTS</b>	Exceptionally clean Move right in	Good views Low maintenance home	Fantastic fireplace Lots of extras everywhere

**APPENDIX D**  
**Experimental Stimuli**  
**Price Level \$120,000 - \$149,999: Houses 4, 5, Moderate Outlier**

<b>PRICE LEVEL:</b> <b>\$120,000-</b> <b>\$149,999</b>		<b>QUALITY CONFIGURATION</b>		
<b>ATTRIBUTE</b>	<b>HOUSE #4</b>	<b>HOUSE #5</b>	<b>MODERATE OUTLIER</b>	
<b>AGE</b>	5 yrs	7 yrs	1 yrs	
<b>ACREAGE</b>	1.75 ac	1.63 ac	1.85 ac	
<b>SQ FT</b>	3030	3020	3300	
<b>FLOORING</b>	WWC/V/TILE	WWC/V/TILE	WWC/V/TILE	
<b>CONDITION</b>	Very Good	Very Good	New	
<b>BASEMENT</b>	Full/Finished	Full/Finished	Full/Finished	
<b>HEAT/COOL</b>	HP/HP	Forced air-gas/Central air	Forced air-gas/Central air	
<b>WATER/SEWER</b>	Public/Public	Public/Public	Public/Public	
<b>APPLIANCES</b>	Range, Ref., DW, Disposal	Range, Ref., DW, Disposal	Range, Ref., DW, Disp	
<b>EXT. FEATURES</b>	Storm Doors/Windows, Screened Porch	Insulated Glass, Screened Porch	Insulated Glass, Deck, Screened Porch	
<b>INT. FEATURES</b>	Paddle Fans Dining Room, Family Room Family Room Smoke Alarms, Cable Eat-in kitchen	Paddle Fans Dining Room, Family Room Family Room Smoke Alarms, Cable Eat-in kitchen, Fireplace	Paddle Fans Dining Room, Family Room Family Room Smoke Alarms, Cable Eat-in kitchen, Fireplace, Pantry	
<b>COMMENTS</b>	Long views, Spacious rooms All top of the line appliances	Super view, Spacious rooms Tiled Foyer Too many features to mention - a must see	Skylights, Spacious rooms Tiled Foyer, This is a dream of a house, Impressive open foyer, Special touches everywhere	



# APPENDIX D

## Experimental Stimuli

### Price Level \$150,000 + : Houses 1, 2, 3

PRICE LEVEL: \$150,000 +	QUALITY CONFIGURATION		
ATTRIBUTE	HOUSE #1	HOUSE #2	HOUSE #3
AGE	8 yrs	10 yrs	8 yrs
ACREAGE	2.2 acre	1.82 acres	1.52 ac
SQ FT	3510	3490	3000
FLOORING	HD/CPT/TILE/V	HD/CPT/TILE/V	HD/CPT/TILE/V
CONDITION	Very Good	Excellent	Excellent
BASEMENT	Full/Finished	Full/Finished	Full/Finished
HEAT/COOL	HP/HP	HP/HP	2-zone HP/2-zone HP
WATER/SEWER	Public/Public	Public/Public	Public/Public
APPLIANCES	Range, Ref, DW, Disposal	Range, Ref, DW, Disposal	Range, Ref, DW, Disposal, W/D
EXT. FEATURES	Insulated Glass Deck	Insulated Glass Deck & Porch	Insulated Glass Deck and Screened Porch
INT. FEATURES	Paddle Fans Dining Room Family Room Cable Fireplace Vaulted Ceilings	Paddle Fans Dining Room Family Room Cable Fireplace Vaulted Ceilings	Paddle Fans Dining Room Family Room Cable Stone Fireplace Vaulted Ceilings
COMMENTS	Some views Lots of space everywhere	Nice view Like new inside and out Big kitchen, Great floor plan, Plenty of windows and light	Super views from all rooms Impressive stone fireplace Big center island kitchen

**APPENDIX D**  
**Experimental Stimuli**  
**Price Level \$150,000 + : Houses 4, 5, Moderate Outlier**

<b>PRICE LEVEL:</b> \$150,000 +	<b>QUALITY CONFIGURATION</b>		
<b>ATTRIBUTE</b>	<b>HOUSE #4</b>	<b>HOUSE #5</b>	<b>MODERATE OUTLIER</b>
<b>AGE</b>	3 yrs	2 yrs	New
<b>ACREAGE</b>	2.7 ac	1.9 ac	2 ac
<b>SQ FT</b>	3550	3525	3700
<b>FLOORING</b>	HD/CPT/TILE/V	HD/CPT/TILE/V	HD/CPT/TILE/V
<b>CONDITION</b>	Excellent	Excellent	Excellent
<b>BASEMENT</b>	Full/Finished w/ bath	Full/Finished w/ bath	Full/Finished w/ bath
<b>HEAT/COOL</b>	Forced air-gas/Central air	Forced air-gas/Central air	Forced air-gas/2-zone CA
<b>WATER/SEWER</b>	Public/Public	Public/Public	Public/Public
<b>APPLIANCES</b>	Range, Ref., DW, Disposal, W/D, Built-in MW	Range, Ref., DW, Disposal, W/D, Built-in MW	Range, Ref., DW, Disposal, W/D, Built-in MW
<b>EXT. FEATURES</b>	Insulated Glass, Deck & Screened Porch	Insulated Glass, one w/ scrns and strm windows	Insulated Glass, Deck & Screened Porch
<b>INT. FEATURES</b>	Paddle Fans, Dining Room, Family Room, Cable, Stone Fireplace, Vaulted Ceilings, Walk-in closets	Paddle Fans, Dining Room, Family Room, Cable, Stone fireplace, Vaulted ceilings, Walk-in closets, Big eat-in kitchen	Paddle Fans, Dining Room, Family Room, Cable, Stone fireplace, Vaulted ceilings, Walk-in closets, Balcony, Pantry
<b>COMMENTS</b>	Fantastic long range views, Spacious rooms, Top grade appliances, Master BR on main floor	Wonderful view, Spacious rooms, Many special touches, Master BR on 1st floor	Spectacular view, Spacious rooms, Decorator touches, Unique master BR on main floor w/ Jacuzzi
			Wiring for home office

**APPENDIX D**  
**Experimental Stimuli**  
**Extreme Outlier**

<b>EXTREME OUTLIER</b>	<b>QUALITY CONFIGURATION</b>
<p><b>ATTRIBUTE</b></p> <p><b>AGE</b></p> <p><b>ACREAGE</b></p> <p><b>SQ FT</b></p> <p><b>FLOORING</b></p> <p><b>CONDITION</b></p> <p><b>BASEMENT</b></p> <p><b>HEAT/COOL</b></p> <p><b>WATER/SEWER</b></p> <p><b>APPLIANCES</b></p> <p><b>EXT. FEATURES</b></p> <p><b>INT. FEATURES</b></p> <p><b>COMMENTS</b></p>	<p>New</p> <p>10 ac</p> <p>4200</p> <p>HD/WWC/TILE</p> <p>Excellent</p> <p>Full/Finished w/ bath</p> <p>Forced air-gas/2-zone Central Air</p> <p>Public/Public</p> <p>Jennaire, Ref., DW, Disposal, W/D, Compactor</p> <p>2 decks, Screened porch, pool</p> <p>Satellite dish</p> <p>Eat-in kitchen, Walk-in closets</p> <p>Family Room w/ wet bar</p> <p>Workshop, Den, Jacuzzi</p> <p>2 beautiful stone fireplaces</p> <p>Tremendous view</p> <p>Solar panels</p> <p>Electric garage door, landscaped yard, guest house, Decorator touches, This is a stunning house</p>

## APPENDIX E

### Real Estate Agent Rating of Importance of House Features Pretest Results (n=11)

For each of the home characteristics below, please indicate the percentage of buyers who, in your experience, consider the item important when purchasing a home; *and if important*, whether the item is generally Critical to their decision, Very Important but Negotiable, or Somewhat Important and Negotiable.

<i>Percentage Who Consider Item Important</i>	<i>ITEM</i>		<i>t</i>	<i>Somewhat Important and Negotiable</i>
			<i>Very Important but Negotiable</i>	
90.5	Number of bedrooms	7	4	-
86.5	Number of bathrooms	6	5	-
86.0	Type of neighborhood	7	2	2
60.5	Age of house	-	7	4
82.0	Condition of house	3	7	1
66.5	Interior layout	2	6	3
62.5	Distance to work	2	6	3
45.5	Distance to school(s)	1	5	4
41.0	Size of yard	1	3	6
59.3	Type of heating/cooling	3	5	3
56.5	Kitchen size	1	4	6
47.5	Kitchen layout	2	3	6
28.0	Age of appliances	-	1	8
28.5	Type of exterior trim	-	3	5
38.0	Average room size	1	5	3
43.3	Den/playroom	1	5	4
72.0	Garage	5	4	1
1.9	Pool	-	1	5
9.3	Jacuzzi/hot tub	-	1	5
8.3	Microwave	-	-	7
18.5	Washer/Dryer	-	1	9
48.0	Cable Availability	1	3	5
49.0	Fireplace	-	7	2
63.0	Basement	2	8	1
21.5	Workshop	-	5	6
36.5	View	1	6	2

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