THE EFFECT OF PAIRED COMPARISONS ON TRIPLE CHOICE SETS

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ABSTRACT

As consumers become aware of different brands they might purchase, it is likely they will consider those brands by making a series of paired comparisons, before finally settling on one option they prefer most. Choice theory suggests that preferences are formed early, so by influencing a consumer to prefer one option in favour of other options at the start of a choice episode, this can have a systematic effect on subsequent, and in particular final choice. Simonson, Nowlis, and Lemon (1993) assert that consumers who make paired comparisons of alternatives that vary in price and quality before selecting from a triple set of the same options are more likely to choose the cheapest option, than those who evaluate just the triple set comprised of the same options. Four experiments tested this claim but the predicted effect failed to occur. Moreover, results from one experiment had the reverse effect, the preference share of the cheapest option decreased, while the share of the more expensive options increased. This was a statistically significant result. This contra finding is in agreement with the large body of published evidence that suggests consumers, when it is possible for them to do so, prefer higher quality to lower quality options. The effect of background factors on choice was of concern, so the effect of gender, household income, and age on choice was tested. Results from these tests were inconsistent, and showed that only young males from high-income households were significantly effected by the stepwise treatment. There was concern that heterogeneity in the sampled group of respondents might have confounded the measurement of treatment effects. To help reduce the influence of background factors, all results were weighted. However, Simonson et al. did not account for heterogeneity, so it is possible their treatments have interacted with some background factor associated with the context of choice, individual difference between respondents, or the product attributes. For this reason, the claim by Simonson et al. is open to criticism. Alternative explanations for Simonson et al. (1993) findings are advanced. New research is required into the effects of paired comparisons on choice.

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INTRODUCTION

When a consumer becomes aware of different brands they might consider purchasing, they might compare each of the brands against each other in a series of paired or local comparisons, before finally settling on the one option they prefer most. Many believe it is during this early comparison phase that preferences for the considered options are formed, so by influencing a consumer to prefer one option in favour of other options early in a choice episode, then these early formed preferences can systematically effect subsequent evaluations. How these early pairings systematically effect final choice is the focus of this thesis.

One claim of interest is that of Simonson, Nowlis, and Lemon (1993), who contend that consumers who make paired comparisons of alternatives that vary in price and quality before selecting from a triple set of the same options, are more likely to choose the cheapest option than those who evaluate just the triple set comprised of the same options. More simply, Simonson et al. claim that pairwise consideration favours lower priced, lower quality options over higher priced, higher quality alternatives. If such choice tendencies are systematic and reliable, as claimed, then this local choice effect would be useful to marketing mangers as they develop promotional marketing strategies. However, it is questionable if the local choice effect is as predictable as they suggest.

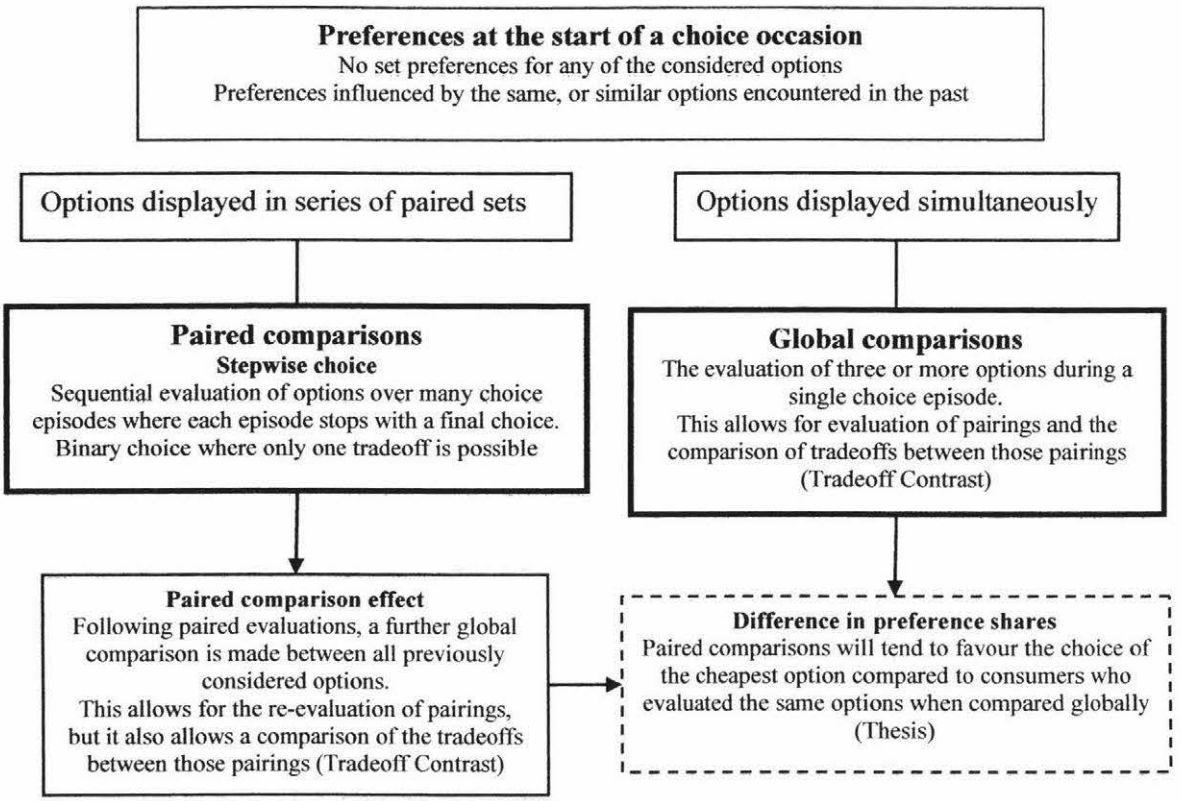
The corpus of opinion in the choice literature suggests, that when a consumer has an opportunity to select a higher quality option they will do so, rather than selecting a lower quality option. This contradicts Simonson et al. claim. Recent evidence from a replication of Simonson et al. experiments by Brennan and Laafai (2003; 2002; Laafai, 2002), failed to support Simonson et al. claim as no such systematic effect was found, but they do suggest the possibility of an income boundary effect. In sum, this replication, along with the overwhelming opinion of others, seems to suggest that the experimental evidence Simonson et al. has used to support their claim is an aberration. For this reason, it is worthwhile retesting their claim, but this time using a different methodology to display choice options, to account for the effects of heterogeneity in the samples, and to test for the effects of gender, household income, and age on choice.

Figure 1 outlines the general direction of the current study and the effect of paired comparisons on overall choice.

Figure 1

The effect of paired comparisons on overall choice

Background contrast verse local contrast



Briefly, some consumers arrive at a choice occasion with a well-developed preference for some, or all of the options presented to them. For these consumers choice is relatively straightforward. However, as it is unlikely that a consumer can have an established preference for every option they encounter, so they often need to form preferences from scratch. Without forming such preferences, the only other alternative to solve a choice problem, is choice by chance.

Realistically, most consumers arrive at a choice occasion unprepared, or at best with only minimal information about the options they are likely to encounter and eventually purchase. These consumers are likely to consider the various attributes or the features of each option relative to other options. To make these comparisons, they might utilise

information gained from similar choice situations, or they may obtain information directly from the choice environment. In such a retail environment, options are arranged in a manner that favours the selection of one particular option over others. Typical of such promotional strategies is to display items at eye level, or retailers may position offerings in some kind of sequence so a cheap option is compared with a more expensive option, and so on. Retailers also influence choice by the inventory they carry, for their offerings helps to define the number of options the consumer is likely to consider during a choice occasion, unless the consumer decides to shop at another store. In sum, the retailer not only influences the size of the local choice set, but can also dictate the order by which options are noticed and evaluated. One useful promotional strategy suggested by Simonson et al. is to arrange three options in such a way that consumers will first compare an expensive brand with a cheap brand, then a cheap brand with a middle priced brand, and so on. If Simonson et al. is correct then such an arrangement is likely to result in consumers preferring the promoted cheap brand, rather than one of the other brands displayed.

Figure 1 shows two choice conditions. On the left, a series of sequential pairwise choice episodes, followed by a final choice episode where all the options are considered together in a global comparison. Choice in the pairings means the choice of one option rejects the other option, while a final overall choice involving three or more options means that to select one option the choice maker must reject two or more options. To decide which option to keep and which option to reject requires a tradeoff between options or their attributes. The right hand side of Figure 1 shows a choice condition where all options are displayed simultaneously, so tradeoffs are possible between the options.

This thesis measures the difference in preference share between both pairwise and global choice conditions, in the expectation that consumers will favour the lowest priced, lowest quality option over higher price-quality options. If the preference share changes significantly in favour of the lowest price option, then this is sufficient evidence to support Simonson et al. claim.

LITERATURE REVIEW

Introduction

The published literature on consumer choice is voluminous, multidisciplinary, and complex. While on the surface the effects of paired comparisons on final choice may appear as a uncomplicated field of study, it is not straightforward. Due to the complexity of the issues involved, it is difficult to report on such a pivotal field of research without frequent reference to the choice literature at large. To help in the presentation of the various consumer choice theories and research findings, two parts help organise the material into a coherent report. The first part outlines the different concepts and terms, such as consideration, consideration choice sets, and the concept of contrast. The second part focuses on the main body of the choice literature as it concerns the contextual effects of local and global choice sets on final choice. This requires four separate but interrelated divisions to help classify the material relevant to the current topic. The first three of these subdivisions takes a micro or psychological approach to consumer choice, where reported research attempts to explain how task, framing, and asymmetric dominance effects choice. The final division takes a macro approach to consumer choice behaviour, by concentrating on empirical based patterns of consumer choice. While this last section may appear tangential to the current field of study it is important, for recent findings have contradicted the concept of loss aversion. This is of significant concern, as loss aversion or the reference dependant model of choice is the main theory that underpins the bulk of research on paired comparisons.

PART ONE

REVIEW OF CONCEPTS AND TERMS

To help in understanding what follows, it is necessary to explain some basic terminologies. In the published literature on consumer choice it is often difficult to separate the meaning of evaluation, consideration, and choice. In this thesis, the term evaluation involves the assignment of quantitative or qualitative values to options or their attributes, while consideration involves the balancing of these evaluations by combining this information with previous choice experiences, and, or, using information obtained directly from the immediate choice environment. While in theory these terms are separate, it is uncertain when evaluation stops and consideration begins for such cognitive processes are unobservable. Choice on the other hand is the outcome of all preceding parts of the process that leads to the consumer to make a final decision in a specific choice episode. Choice becomes observable when a consumer demonstrates their preferences by word or physical actions such as purchase. A choice episode involves the train of thought from initial exposure to final choice. It is possible for there to be a number of choice episodes during a choice occasion.

Consideration

In many retail environments, the number of options considered by consumers is defined by the assortment of options on display, where failing to choose from these offerings may necessitate expending additional effort to shop in a different store or go without. These situational or extrinsic factors help constrain choice to a specific set of options. In other situations, the lack of information (Kivetz & Simonson, 2000) or the unavailability of alternatives may affect choice, although these effects may depend on product category, the perceived cause for the unavailability of the considered options, and the order in which the unavailable option are compared with available options (Simonson & Tversky, 1992, p.288). This partitioning of options into groups or sets is not only confined to retail situations, for it can also apply to industrial buyers where option compatibility, high switching costs, low decision importance, and high formalisation required for purchase affect option acceptance (Heide & Weiss, 1995). Kahn, Moore, and Glazer (1987) demonstrate that such extrinsic constraints can affect the choice between brands, depending on the preference order of, and the similarity

between them. Although, Nedungadi (1990) contends that the role that brand name plays in choice first depends on memory, for first the consumer must recall information about a brand, but frequently consumers often fail to recall other brands which they otherwise might have been preferred but which are not on display.

Similar to Khan et al. (1987), Hauser (1986) describes choice alternatives as a collection of aspects, and suggests these are used as an agenda that involves a sequence of constraints where the consumer makes a series of choices between options. Their model of choice depicts choice events in the form of a hierarchal preference tree with no overlapping branches, where at each node the consumer must choose among the existing branches that exit that node (Hauser, 1986, pp. 201-202). Hauser adds by way of a footnote, that his model of choice focuses on individual consumer behaviour, not aggregated market behaviour. Unlike the hierarchal tree structure used by Hauser (1986), a study by Simonson , Nowlis, and Lemon (1993) depicts choice as a series of parallel local choices leading to a final overall choice. In particular, they provide evidence showing that the same set of considered alternatives can lead to systematically different choices, depending on the manner by which the alternative options have been evaluated. They seem to be suggesting that the outcome of choice depends not only on the attributes of the options considered, but also from evaluations made during a series of paired comparisons which eventually effects overall choice. If this claim is true, it requires further testing, for it is a seductive thought that retailers need only arrange the presentation of their offerings to direct choice towards accepting a targeted product. While it is important for marketing managers to know which alternatives consumers might consider, it is also essential to understand how the various options are evaluated by consumers, to enable managers to develop effective marketing strategies (Simonson et al., 1993; Simonson & Tversky, 1992).

While it is uncertain how consumers actually evaluate and consider competing options, it does appear that consumers' often adapt their decisional strategies to the choice occasion, and may use several different decisional strategies to select the final option (Bettman, 1979; Bettman, Luce, & Payne, 1998; Gigerenzer & Selten, 2002; Simonson, 1989; Simonson & Tversky, 1992; Tversky & Kahneman, 1981). Placing to one side the vast literature on information processing, Bettman (1979) and others promote a view that often consumers do not have well-defined preferences, but instead they construct

them on the spot - when needed (Bettman et al., 1998; Payne, Bettman, & Johnson, 1992; Simonson, Carmon, Dhar, Drolet, & Nowlis, 2001; Simonson et al., 1993).

According to Bettman, an important property of this constructive approach to choice is that preference often depends on the context of the choice occasion. Furthermore, as a consumer makes many decisions on the fly, their mental processing will be highly sensitive to the local problem structure. This implies that processing approaches change as a consumer learns more about the choice problem during the course of making a decision (Bettman et al., 1998, p.188). In the same vein, Simonson and others (Simonson et al., 1993; Simonson & Tversky, 1992) suggest that the same set of considered alternatives can lead to systematically different choices, depending on the manner by which alternatives are evaluated. That is, consumers do not consider all the all options at the same time, but rather they evaluate the various options in a series of separate subsets before making a final overall choice (Simonson et al., 1993, p.356).

Consideration sets

One way to describe choice behaviour is to consider the choice process as a series of tiered levels, where a sequence of stages or phases act to filter, eliminate, or reduce the number of alternatives from a universe of potential options to a more manageable set of alternatives. Having selected a set of options of interest, a person may then mentally rearrange these options into small groups or consideration sets. The consumer then evaluates this set of options more seriously by way of a series of comparisons or tradeoffs to arrive at a final selection.

While this two-stage choice model (Gensch, 1987) appears well supported by many authors (Bronnenberg & Vanhonacker, 1996), the opponents of such a model question whether consideration sets exist at all, and if they do exist are they useful in predicting choice behaviour. Horowitz and Louviere, for example, present evidence that consideration sets are simply indicators of preferences, for any consideration set provides no more information to a choice maker than what is already available to them from the pool of potential options (Horowitz & Louviere, 1995). Accepting the concept of consideration sets, Roberts and Lattin (1997) suggest there is support for the possibility that the phased approach to choice also applies to decisions within the consideration set. For evidence of this, they point to Simonson, Nowlis, and Lemon

(1993) study where consideration itself is a staged process, and that the membership of the competing brands at each stage during consideration can effect final choice.

While the two-stage model is useful in describing choice as a process, it fails to account for the dynamic nature of choice, such as when consumers might be either aware or unaware of available options (Howard & Sheth, 1969; Nedungadi, 1987). This suggests that consideration sets are really awareness or evoked sets of options (Wright & Barbour, 1977), which the consumer may or may not consider purchasing. That is, the term 'consideration set' helps describe brands or options a consumer considers acceptable from those that are not. In the same vein, Gensch and Soofi (1995) propose that the decision-making process leads to the partitioning of the awareness set into two disjoint subsets; a consideration set and non-consideration sets. From this, it is reasonable to presume there are many differing choice occasions where the number of realistically available options under consideration varies. For example, in a repeat purchase situation the consideration set may consist of a single option (as in new automobiles, Lapersonne, Laurent, & Le Goff, 1995), while in other situations the number of options under consideration are larger. For instance, Gensch (1987) mentions four options in a set, while Hauser and Wernerfelt (1990) list larger set sizes. However, for practical reasons, most research studies restrict choice experiments to only two or three options, while at the same time limiting the number of presented attributes.

Contrast

One fundamental tenant in the marketing literature is that different alternatives or options can be described by their attributes, where some attributes are shared while other attributes may be assessed as unique to a particular option (Tversky, 1977). It is this uniqueness or difference which helps categorise or discriminate one attribute or option from others (Cohen & Basu, 1987; Simonson & Nowlis, 2000; Tversky, 1977). A further fundamental assumption in the literature is the concept of valuation. Comparison making first requires the assignment of some kind of weighting system or value to the various options and, or, their attributes which are then used as comparisons. Typical of such valuation tasks are those that involve the concept of quality. How these values are expressed is a matter of conjecture and beyond the scope of this review (see Zeithamal, 1987, 1988). However, it is important to understand that the act of valuation is separate to that of value; valuation is a process, while value concerns the assignment

of some kind of dimension that enables comparison making. Both valuation and value assignment are highly personal and likely idiosyncratic in nature.

When a consumer engages in a series of comparisons between attributes during the choice process, it is possible that within a consideration set, some attributes can change the consumer's perception about other options or their attributes. This change in perception, where options or their attributes influence each other during consideration, is termed the contrast effect. According to Simonson and Tversky (1992), contrast effects not only include single attributes, such as size or attractiveness, but can also extended to tradeoffs (tradeoff contrast).

Accepting that perceived differences between attributes helps to differentiate options from each other, it also means accepting there are sometimes a large number of both similar and unique attributes to consider in a universe of potential options. Gensch (1987, p. 224) proposes that consumers make use of these attributes to help reduce a multitude of feasible alternatives down to a final consideration set, then in the final stage of selection all the attributes are considered together. Gensch further suggests that during this concluding stage, choice will be by options rather than by their attributes. Wright and Barbour (1977) also believe that during the final selection stage, consumers are more likely to use decision strategies where a good value on one attribute can compensate for the poor value on another attribute, but the use of such a compensatory rule during the initial elimination phase is less likely. Similarly, Russo and Dosher (1983) suggest that in the natural world choice is organised by alternatives, and that each of these alternatives are evaluated as a whole (holistically), but in other situations where one option dominates another by some attribute or other, then choice involves the comparison of attributes (dimensional processing).

As the number of options increase, it is reasonable to assume that the manner by which those options are compared also changes. When a consumer is comparing only two options, then selection of one option rejects the other. This is different to a choice situation that involves three or more options, where the acceptance of one option means the rejection of two or more options. In situations where one option or attribute is preferred over all others, then the choice is a simple one, but if the consumer has no set preference for any of the considered options or their attributes, then choice becomes

more complex. This complexity arises from the need to first form a preference for the options or the attributes under consideration. It is during this preference formation that the context of the choice occasion is important, as it is possible for the same set of considered options to give systematically different choices, depending on the manner or context in which the options are presented to the consumer (Simonson & Tversky, 1992).

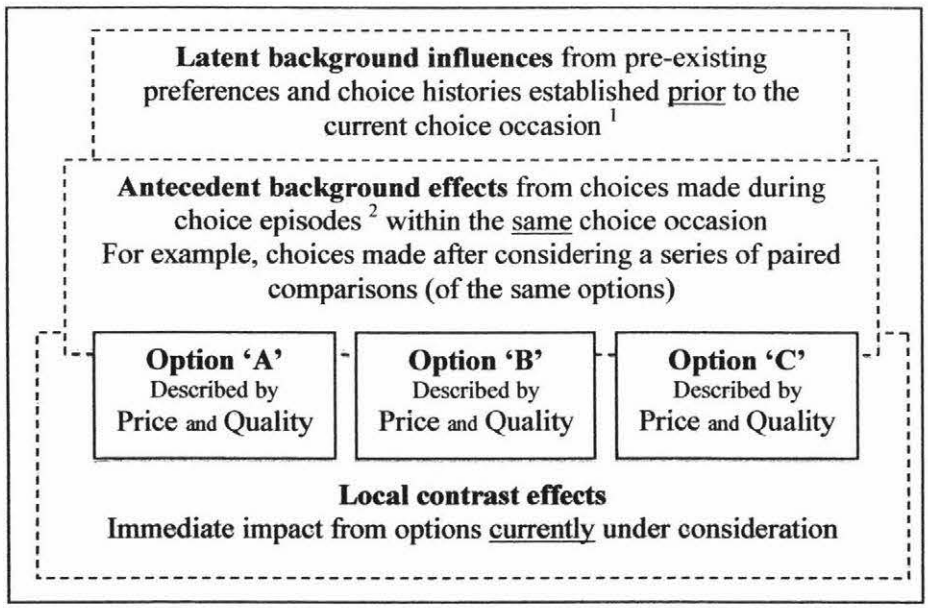
Background contrast

When a consumer arrives at a choice occasion, they bring with them their own preference and choice history. As Figure 2 shows, knowledge gained from some previous encounter with the options or similar options under consideration, is likely to influence choice. In light of this, it seems sensible to accommodate the realistic assumption that consumers have many existing preferences, and that these can act for or against one or more options during the choice process.

Figure 2

Contexts effecting choice

Adapted from Simonson and Tversky (1992)



[1] Each choice occasion may include multiple choice episodes or events.

[2] Each choice episode takes place within one continuous period, while other unrelated choice tasks help to separate each choice occasion.

Simonson and Tversky (1992) account for the influence of previously acquired preferences during choice by way of background contrast effects. While it is acknowledged there is considerable evidence suggesting consumers can hold strong preferences about brands encountered in the past, they also have a tendency to vacillate in their choice between only a small number of these options (brands) during purchase (Castleberry, Barnard, Barwise, Ehrenberg, & Riley, 1994). Accepting that consumers use existing preferences, then they first must recall this information for it to be of any use, but it appears consumers often fail to use all the information available to them during consideration, even when they are familiar or have experience with the product category (Simonson et al., 1993, p.374). Bettman and others (Bettman et al., 1998), use this as evidence to support the claim that people only construct preferences when faced with the need to do so. Simonson, Nowlis, and Lemon (1993) also use this evidence as the theoretical basis to their claim that, the same set of considered alternatives can lead to systematically different choices, as the manner of preference formation is different when the same options are considered (presented) in a series of pairwise comparisons, compared to considering the same options in a single triple set. It is their belief that preferences are formed early during choice, so by influencing a consumer to prefer one option in favour of other options early in a consideration episode, this in turn effects subsequent evaluations during the same choice episode. Simonson et al. (1993) contend that this effect is systematic, although the results from replicating their study by Brennan and Laafai (Brennan & Laafai, 2003a; 2003b) failed to find such systematic effects.

Context in choice

In the choice literature, the use of the term 'context' varies between studies, making for difficulty in separating various contexts and the effect these have on choice. In a broad sense, context can refer to the consumption or usage situation, the influence of noise during the consideration episode, or the amount of time made available in which to decide between options. For consistency, this review broadly refers to context as the influence various options have on each other during a specific choice occasion. That is, context involves the choice process or its outcomes as a function of the particular options included in a specific choice set (Ratneshwar, Shocker, & Stewart, 1987). Simonson and Tversky (1992) extend this meaning of context to not only include single attributes, but also tradeoffs between attributes, differences between currently available

options, and the influence of relevant alternatives encountered in the past. Such distinctions helps to separate local effects from the impact of the offered set of options on choice, as opposed to background effects from the influence of options considered in the past. See Figure 2.

Overall, the contextual view of choice is at odds with conventional economic theory, which considers consumers as all-knowing and rational decision makers. Such a conventional view of choice assumes that each alternative has some form of utility or subjective value, and that choice-makers always attempt to select the alternative that gives them the maximum value (utility). The implication of this value-maximisation concept is that preference is independent of context, as defined by the set of alternatives under consideration (Simonson & Tversky, 1992). One important aspect of value maximisation is an assumption of proportionality. Proportionality proposes that the introduction of a new offering into an existing choice set, will take preference share from the other options in the same proportion to their original shares. This concept acted as the basis for many early choice models designed to predict share (for example, Luce, 1959). However, the assumption of proportionality has shown to be a poor predictor of product share. As Huber et al. point out, 'new products [often] take more share from those similar to it than from dissimilar items' (Huber, Payne, & Puto, 1982, p.90). Such change in preference shares has important implications for retailers. These are reported in a separate section of part two of this review; they involve asymmetric effects.

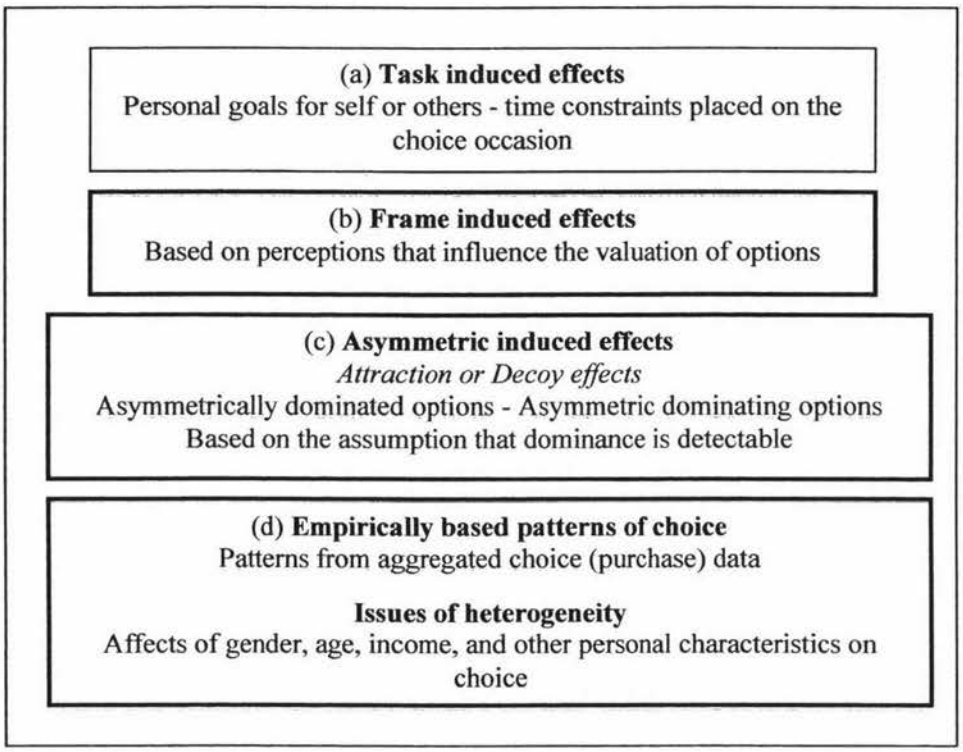
PART TWO

REVIEW OF CONTEXTUALLY INDUCED EFFECTS

Due to the complexity and the extent of the literature on contextual effects the balance of this review is divided into four sections, see Figure 3.

Figure 3

Overview of contextual effect theories



The first section (a) addresses the findings on task-induced effects, and relies on an assumption that personal goals during a choice episode can influence the way in which presented options are considered. This same section, briefly reviews the affect that time has on choice, and ends with the findings from an experiment by Simonson et al. (1993), who tested for the difference task plays when options are considered pairwise, as opposed to comparing those same options (globally) in triple option sets. The second section (b) focuses on the belief that it is possible to change an individual's perception of a choice problem by framing the same choice problem in different ways. The third section (c) reports on the voluminous and complex research involving asymmetric tradeoffs, where the propensity to select one option from a triple option choice set, as measured in two-dimensional attribute space, depends on whether one option either

dominates or is dominated by another option. It is worth noting, in the choice literature the term 'asymmetric effect' also refers to the attraction or decoy effect; essentially all three terms are interchangeable. The fourth section (d) differs from the previous three, as it concentrates on systematic choice patterns in large data sets taken from actual retail sales, rather than trying to provide individualised psychological explanations for choice behaviour. Included in this section are the problems that can occur when interpreting aggregations of data, and the problematic effects of heterogeneity on the interpretation of results. Following on from this a final section summarises both parts of this review, and proposes how new research can build on what is already known about the effects of paired comparisons on final choice.

Task induced effects

When a consumer makes a selection from a set of options presented to them, the activity or task in doing so can influence choice. In most studies, the selection task is designed so all participants are asked to carry out a particular task in the same manner, with individual differences in completing that task averaged out when results are finally aggregated. However, there are special circumstances where personal goals, time pressure, or the choice environment may affect choice. For example, in a retail store environment, Grewal and Baker (1994) report that the ambiance of the choice occasion, the presence of other consumers, and the manner in which offerings are displayed can influence choice. The positioning of options relative to each other in a store can influence the task of selection. For example, Simonson et al. (1993), focussing on the paired-comparison effect, reports that consumers are more likely to select the lowest-price, lowest-quality option when options are displayed by brand, as compared to displaying the same options by their features. In an unrelated series of experiments, Simonson (1992) advocate that choice can be influenced or framed (see the following section) by asking consumers how they might feel if they make the wrong choice, before they make one; they contend that this priming systematically influences consumers to act more conservatively in their selections. Similarly, in the field of online bidding, explicit instructions designed to compare options can make the bidder more cautious, resulting in a tendency to compromise by selecting all-average alternatives (Dholakia & Simonson, 2005). Shiv and Huber (2000) also demonstrate that anticipating the satisfaction of purchase prior to selection can influence the choice occasion, while Simonson and Winer (1992) propose that as the number of items

purchased increases, the consumer is more likely to select product variants which they normally may not have selected.

It is generally accepted that reducing the time made available in which to make a choice between options can influence that choice (Howard & Sheth, 1969). While time available for choice can be controlled during an experiment, time can also be represented as time-pressure, such as when an individual perceives there are limitations to the available time on which to base a decision (Suri & Monroe, 2003). Consumers can also be time-inconsistent, where long-term preferences can suddenly change between choice occasions (Hoch & Loewenstein, 1991). It appears that when time constraints interfere with a consumer's ability to consider presented options, then consumers have a tendency to simplify their choice strategies by considering the unique features of options, rather than common features (Dhar & Nowlis, 1999). Nowlis (1995) suggests that when consumers are forced to make a decision quickly, they have a propensity to select higher quality, higher priced brands over lower priced brands; or top-of-the-line products with many enhanced features, over that of basic models with fewer features. Such choice propensities are similar to those found by Simonson, Nowlis, and Lemon (1993), who did not impose time conditions on choice.

Simonson et al. (1993, p.361) acknowledge the potential that the task of selecting between options per se, can effect choice. They suggest that when consumers compare options in paired sets, as opposed to evaluating a triple option set, this may force consumers to evaluate each alternative more thoroughly. For instance, they might come to realise that price differences outweigh quality differences. To test if task influenced their paired-choice results (Simonson et al., 1993), respondents were exposed to three options displayed simultaneously, then instructed to compare the three presented options pairwise. Once this pairwise task was completed, they were then asked to consider all three options at the same time (globally). Results showed no difference in the share of the cheapest option between the pairwise-first-then-global-choice tasks, than just the global task. In sum, the task of comparing options was having a minimal affect on their results. However, Simonson et al. experiment is questionable for it imposes additional tasks on the consumer, for having first viewed the triple set of options, consumers then needed to mentally divide the triple into separate pairings in such a manner that all options received equal consideration; following this they then

compared the troika of options. As will be outlined in the next two sections, when the formation of pairings is left to the consumer to decide, then the option with the most unique feature or attribute will most likely be included in the first pairing; the formation of this first pairing, as proposed by Simonson et al. effects the consideration given to any following pairings.

Frame induced effects

It is possible to frame a decision problem in different ways, so that judgements of similarity between options can be influenced by the direction of their comparison (Tversky, 1977). This places the concept of framing at odds with the classical concept of choice that expects that a measure or feature used to judge one option from another option remains unique to that option. The basis of the concept of framing is an assumption that a consumer uses an edited version rather than a full version of the choice problem, and that this effects the valuation of alternative options differs across frames (Kahneman & Tversky, 1979; Wedell, 1991). For example, by first comparing wristwatch 'A' costing $189 with wristwatch 'B' for $159, could be seen as framing watch 'B' in terms of its cheapness, compared with that of watch 'A' ($189; $159). Conversely, by first comparing watch 'B' ($159) with watch 'A' ($189) frames 'A' as expensive ($159; $189). A decision based on the concept of cheapness, is likely to be different from a decision based on the concept of expensive. If affordability is a factor during consideration, then a consumer is more likely to prefer option 'B' when displayed second to option 'A' ($189; $159). In experiments, most researchers rotate the presentation order of the test options then average the results in an attempt to reduce such ordering effects.

As mentioned, framing relies on an edited version of the choice problem, but it appears that during choice greater weight is placed on the unique features of an alternative at the beginning of the comparison making process (Houston & Sherman, 1995; Houston, Sherman, & Baker, 1989; Johar & Creyer, 1993). Within the same research domain, Dhar and Simonson (1992) demonstrate that by changing the focus of comparison, this can enhance an alternative's perceived attractiveness in situations where the consumer has an existing memory about the options, but on which they do not have any particular preference for the options considered. They show that changing the focal option gives weaker and less constant results when consumers are provided with descriptions, as

opposed to consumers who retrieve their descriptions from memory. Dhar and Simonson contend that when evaluating alternatives from memory, as opposed to evaluations made from externally displayed attributes, the focal option receives greater attention and the positive features of that option become more salient.

While the earlier wristwatch example coded options as either cheap or expensive, it is possible to broaden this concept of valuation by coding choice outcomes in terms of either a loss or a gain. The effects of such coding builds on Tversky and Kahneman's work into risky and riskless choice, and their concept of loss aversion (Kahneman, Knetsch, & Thaler, 1991; Tversky & Kahneman, 1991). For a consumer, loss aversion happens when the disutility of giving up an object is greater than the utility associated with acquiring it. The aversion of consumers to certain alternatives during choice, takes into account choice outcomes where 'below the reference point [losses] are weighed more heavily than outcomes that are above the reference point [gains]' (Simonson & Tversky, 1992, p.282). Here a reference point is a psychological construct, where some previously established standard or reference point is compared with some new stimuli, such as a change in price. Such standards or reference points might be based on actual or perceived stimuli, although a reference point may not necessarily be a single absolute value, but rather cover a range of values to form a 'latitude of acceptance' (Sherif, Taub, & Hovland, 1958). Such a 'latitude of acceptance' can be thought of in terms of price or quality tiers.

Loss aversion, according to Kahneman et al. (1991), can account for a variety of choice anomalies. Anomalies such as when people demand more (money) to give up a product than they are willing to pay to acquire the same product (endowment effect). Where consumers have a strong tendency to accept the status quo, for the disadvantages of making a change to a new option looms larger than the advantages of not changing to the new option (the status quo effect, Samuelson & Zeckhauser, 1988).

While the classic account of loss aversion relies on some previously formed reference point by which to evaluate options or their attributes, Simonson and Tversky (1992, p.282) offer an amendment to reference theory, which extends the notion of a neutral reference point to include relationships between other available alternatives. This change recognises situations where the choice maker is not only limited to reference

points they can remember, but it also includes options currently under consideration. That is, evaluations may not only depend on the options displayed, but also on the manner of that display. For example, in a three-option choice set, if option 'A' has the highest price-quality, and option 'C' has the lowest price-quality, while option 'B' is intermediate on both price and quality, then choice is more likely to favour 'B' as it has fewer disadvantages than the difference between 'A' and 'C'. Here option 'B' acts as the reference point. Simonson and Tversky say this example illustrates their extremeness aversion hypothesis, which along with tradeoff contrast they propose can account for the effects of context on choice.

One important contribution to the choice literature is the concept of similarity (dissimilarity), as outlined in Tversky's similarity hypothesis (Tversky, 1972; Tversky, 1977). The similarity hypothesis asserts two things. First, similarity among alternatives can be defined in terms of features or attributes of objects; the similarity between option 'A' and option 'B' will increase with the number of features which both share, but similarity decreases with the number of features that are unique to 'A' or to 'B'. This means that one attribute can be more dominant than another attribute, and this imbalance between attributes can give rise to asymmetries when evaluating options. As Tversky (Tversky, 1977, p.327) indicates, similarity can be represented in geometric coordinate space, where dissimilarity between options or attributes acts as a metric distance function. When an option is termed asymmetric, that option dominates on one attribute, yet it may be inferior to other options on some other attribute. However, it is not possible for all attributes to be represented adequately within quantitative or coordinate space (dimensionally), which means some options are best considered qualitatively by matching features of the options. For reasons of brevity, this review confines itself with attributes describable in coordinate space, while accepting that some consumers may consider options in either quantitative or qualitative terms. The choice outcomes based on qualitative considerations may differ to quantitative evaluations (dimensional verse holistic strategies, Russo & Dosher, 1983; dimensional verse matching strategies, Tversky, Sattath, & Slovic, 1988).

Second, the addition of a new alternative to an existing set of two options can take a disproportionate share from the option or options with which it is most similar, more than from dissimilar options. This second part of Tversky's similarity hypothesis places

it at odds with the assumption of proportionality, which states that share loss is proportional to the original shares. This means that the addition of a new alternative cannot increase the probability of choosing a option in the original set of options, a condition called regularity (Huber et al., 1982). However, a change in the conditions under which choice takes place can affect regularity. For example, regularity suggests that when proportionality operates it does so reliably, provided there are no disturbing factors to prevent this from occurring. This means regularity is conditional on all choice makers using the same attributes, interpreting features in the same way, and where all choice-makers use identical choice methodologies. However, imperfections in human perception and decision-making can change the perspective of a choice task, for the probability of judging two identical products as the 'same' rather than judging them as 'different', is not always constant for all stimuli. For instance, when a consumer considers two identically coloured options, a change in the angle by which those options are viewed can make them appear different to each other (for other visual examples see Haber & Hershenson, 1973).

Asymmetric induced effects

One important aspect in the choice between options is the assumption that rejected alternatives, once rejected, can have no further bearing on choice during the same choice occasion. That is, rejected alternatives add no extra information on which to base a new choice. This notion of rejected information is expressed in the concept of the 'independence of irrelevant alternatives'. However, it is possible to violate this assumption. One such breach has been demonstrated by Huber, Payne, and Puto (1982), who offer empirical evidence for an asymmetric dominance effect. This asymmetric effect becomes evident when an inferior option is added to a pair of existing options in the same choice set. The consequence of this inclusion results in an increase in the share of the superior option relative to its previous share. This effect is a reversal of the similarity hypothesis, which suggests that the option most similar to the added option should increase in share. This suggests a boundary to the similarity hypothesis, which limits similarity effects to choice sets where asymmetric dominance does not occur (Huber et al., 1982; Huber & Puto, 1983).

Slaughter, Sinar, and Highhouse (1999) show that when a asymmetric dominance effect does operate it can be strong, for even when numerical attributes are absent, a decoy or

attraction effect can still persist. The same authors also imply that the valuation of alternative options can change across choice contexts, but Ratneshwar, Shocker, and Stewart (1987) argue that the asymmetric dominance effect diminishes when consumers are familiar with the test options. However, Simonson and Tversky claim that the asymmetric effect still holds for highly familiar products when quality can be easily assessed. Yet on the other hand, the same authors state that if a consumer habitually purchases the same brand in a category, then 'context effects are unlikely to play a major role' (Simonson & Tversky, 1992, pp. 287 & 292). This suggests that latent background influences can overwhelm local contrast effects (see Figure 2).

Accepting that options considered prior to final selection can influence choice, then subsequent evaluations are also likely to include other background information such as the quality and price of those options (Simonson & Tversky, 1992). It is a short step from this to expect that familiarity (prior learning) with a product or brand, is also related to the chance of it noticed (Goodhardt, Ehrenberg, & Chatfield, 1984; McPhee, 1963). This means that market share is related to the probability an option will be seriously considered. In other words, a brand that enjoys the largest market share potentially starts with a greater informational advantage than options in the same choice set which have a small market share. In sum, not all considered options start as equals in choice. It is possible that this informational bias will confound the results in local context experiments.

An underlying assumption in the choice literature is that asymmetries between attributes are detectable by the consumer. Normally, under experimental conditions, the various features or attributes are displayed in such a manner that makes the difference between attributes as clear as possible, but in practice, such distinctions may be less clear. Two frequently used attributes in experiments are those of price and quality. While it is common to accept that quality and price act as if they are co-dependent during evaluations (Monroe & Lee, 1999), the issues concerning price and quality are often unclear, for both price and quality are confronted with the fundamental problem of the meaning of such concepts. For instance, price may mean objective price, the monetary price of a product, perceived price, or the price encoded by the consumer. Furthermore, price can also act as a measure of quality, where a high price suggests high quality and a lower price reduced quality (Gabor & Granger, 1969; Stoetzel, 1954). Additionally,

consumers may encode price information in a way that is meaningful to them, such as coding particular price as either cheap, a financial gain to the choice maker, or as expensive, resulting in a financial loss (as in Dodds, 2002; Dodds, Monroe, & Grewal, 1991).

Allenby and Rossi (1991) advocate that the overall quality of a brand is the weighted sum of its attributes, but the issues involved in the evaluation of 'quality' are less clear. Although most researchers agree that perceived quality is not always equivalent to objective quality. As the evaluation of quality usually take place in a 'comparison context' (Zeithamal, 1988, p.5), this makes choices that involve the concept of quality susceptible to the choice situation and the frame of reference by which the consumer makes their evaluation. As a further complication, it is possible to describe quality in terms of features or attributes, or more broadly by brand name where the reputation of the brand acts as a proxy for quality (Simonson et al., 1993). Yet, using a brand name as the only descriptor of quality, as in Simonson et al. (1993) wristwatch experiment, has inherent problems of brand recognition, for it is feasible that some consumers are unaware of the brand, let alone its reputation or attributes. Furthermore, it is questionable if perceptions of quality can transfer to other countries, or even if such perceptions of quality are time resistant. For example, a Seiko wristwatch could be of high quality when windup watches were common in the 1980s, but in a digital-age, Seiko may no longer hold such a position. It is also possible that quality is a representation of brand familiarity, and as such has nothing to do with workmanship. When consumers face a choice where some of the considered brands are unknown to them, then they are more likely to favour the selection of familiar brands over less familiar brands, this has the potential to bias choice results.

If consumers form their preferences early in the choice process, as suggested, then the manner of presenting options is more likely to influence tradeoffs that involve price-quality relationships, as these are more susceptible to contextual conditions than price-to-price comparisons are. During price-quality tradeoffs, Simonson and Tversky (1992) suggest that consumers weigh price information more heavily than information on quality, although recent research questions such a naïve explanation, by pointing out that some consumers are more price sensitive than others. This difference between consumers sensitivity to price can have a biasing effect on results (Bell & Lattin, 2000).

Tradeoff contrast and extremeness aversion

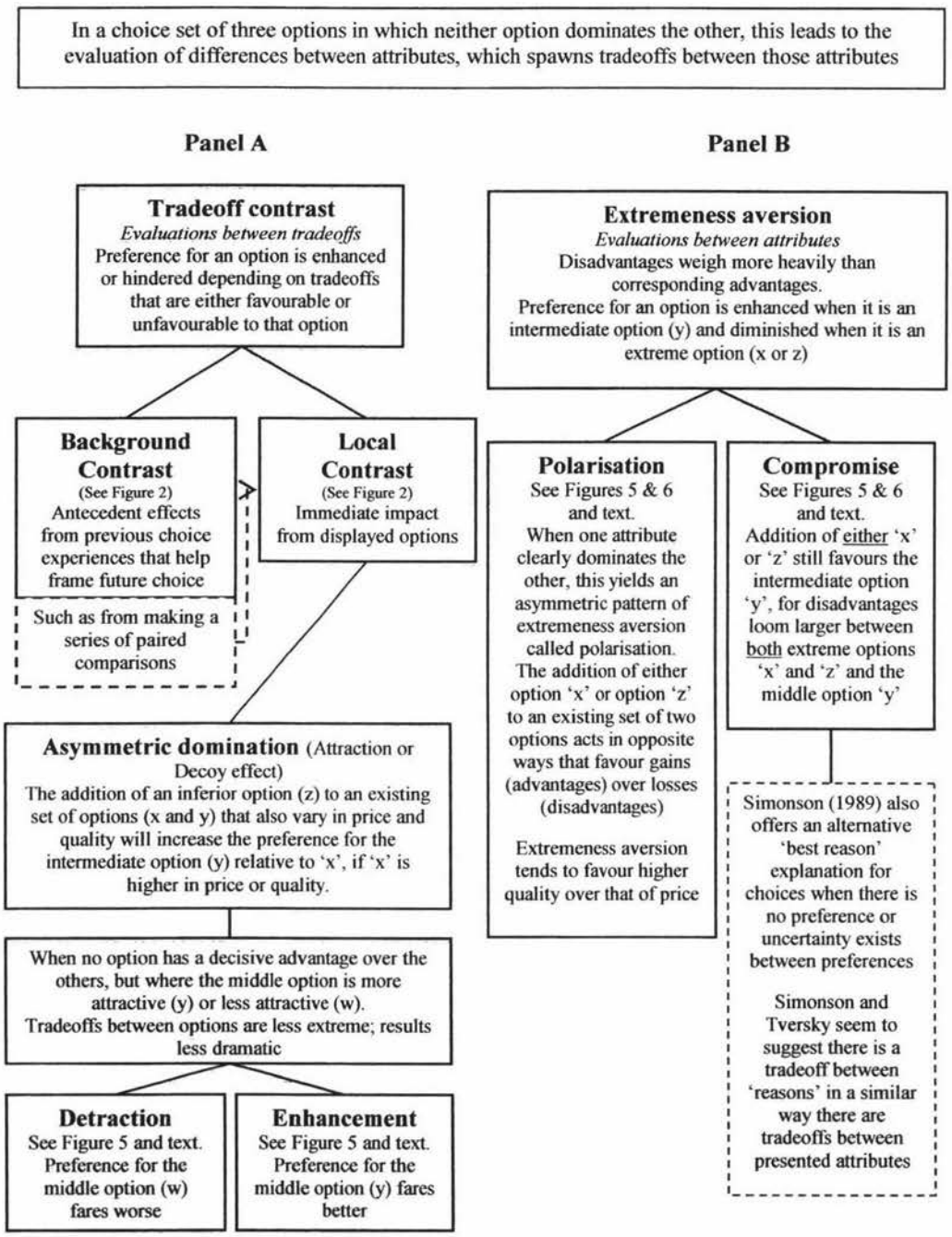
To help explain the effects of context on choice, Simonson and Tversky (1992, p.281) propose two principles - tradeoff contrast and extremeness aversion. They demonstrate these principles by using triple option choice sets, where each option is asymmetric in that the dimensions of one attribute is capable of dominating the same dimension in different option. It is widely accepted that making a choice first involves selecting between options, then, if the consumer cannot decide between those options, they further evaluate differences between options at an attribute level. Then they compare these evaluations in a series of tradeoffs to arrive at a final decision.

Simonson and Tversky hypothesise two forms of tradeoff. First, tradeoffs between attributes where the results of these tradeoffs are coded as providing an outcome measurable in terms of a gain or loss; where loss is weighed more heavily than gains (Tversky & Kahneman, 1974). This evaluation condition is termed extremeness aversion, the details of which are discussed last.

The second group of tradeoffs happen at a higher level than the first, although these tradeoffs may still involve extremeness aversion. In this second form of tradeoff, contrasts made earlier in the same choice occasion are again subjected to further tradeoffs. That is, there is second tier of comparison making between contrasts originally made at the attribute level. This Simonson and Tversky call tradeoff contrast. As tradeoff contrast concerns the comparison of previously made contrasts, then such contrasts may come from considerations made during some earlier choice occasion (latent background contrasts), from choices made during the same choice occasion (antecedent background contrasts), or from the immediate impact of contrasts currently made (local contrast effects). See Figure 2. To assist in making Simonson and Tversky's claims clear, the concepts of tradeoff contrast and extremeness aversion are outlined in two panels in Figure 4; panel 'A' tradeoff contrast; panel 'B' extremeness aversion.

Figure 4

Simonson and Tversky's explanation of the effects of context on choice



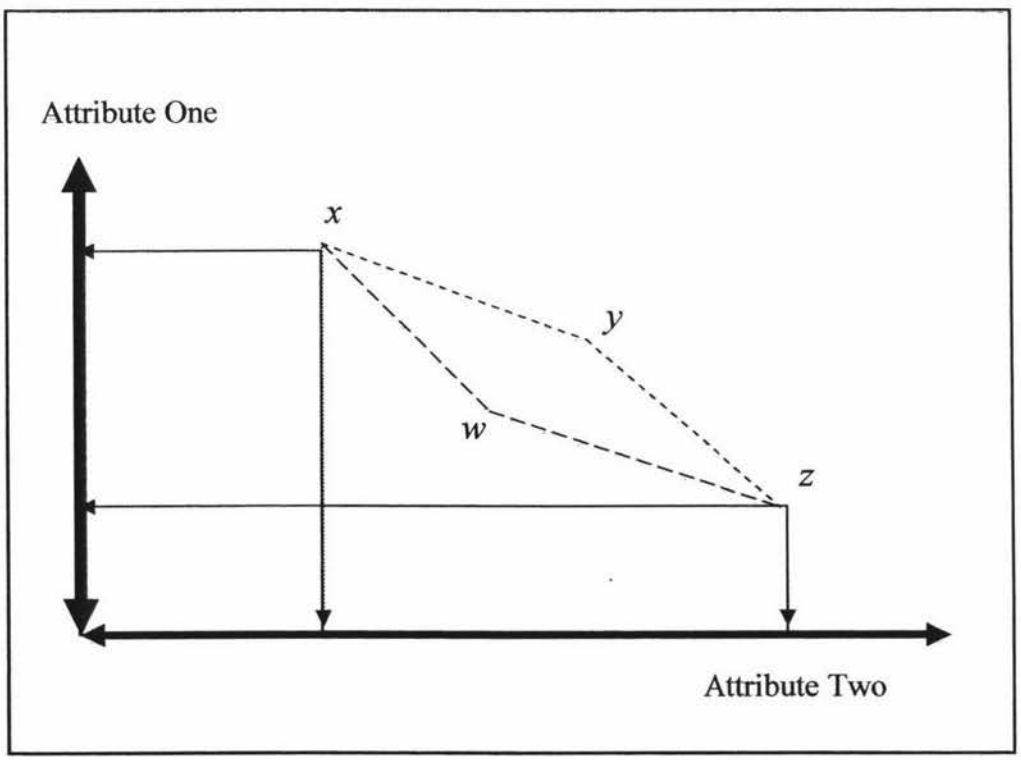
Tradeoff contrast

Realistically, within competitive markets the difference between products as expressed by their attributes and brand image are often trivial and transient. As offerings in retail environments change frequently, this can make for difficulties in discerning attribute differences between various offerings. When consumers make a choice under such dynamic retail conditions, it is reasonable to assume there is an increase in preference uncertainty, and that this uncertainty requires consumers to evaluate attributes more thoroughly than when conditions are less dynamic. While consideration may start with the comparison of a pair of options (say '*x*' and '*y*'), which varying in terms of price and quality, when a third inferior option ('*z*') is considered this can change the preference relationships of previously considered options, in such a way it increases preference for the intermediate option ('*y*') relative to the higher priced, higher quality option ('*x*'). See Figure 5.

Figure 5

An illustration of Enhancement and Detraction

Adapted from Simonson and Tversky (1992)



Note:

y = Enhancement, where tradeoffs between attributes (*y;x, y;z*) are favoured more than either *x* or *z*

w = Detraction where tradeoffs between attributes (*w;x, w;z*) are less favoured than either *x* and *z*

While asymmetric domination describes evaluations where there is a clear difference between attributes and the contrast between attributes that are unambiguous, it fails to distinguish between choice situations where a consumer does not hold a strong preferences for either option *x* or *z*, while options *y* and *w*, respectively, may also be seen as either slightly more or slightly less attractive than *x* or *z*. As the contrast of the *x*-*z* tradeoff with the *y*-*z* tradeoffs favours *y*, because it is average on both attribute dimensions, *y* is expected to fare better in a triple choice set than in the pairs; that is, $P_x(y;z) > P(y;z)$ *and* $P_z(y;x) > P(y;x)$, see Figure 5. Simonson and Tversky call this pattern enhancement. In the same way, because the contrast of the *x*-*z* tradeoff with the *w*-*z* and *w*-*x* tradeoffs is unfavourable to *w*, it is expected *w* will fare worse, for it is below average on both attribute dimensions in the triple than in the pairs. That is, $P_x(w;z) < P(w;z)$ *and* $P_z(w;x) < P(w;x)$; a choice pattern called detraction (Simonson & Tversky, 1992, p. 288).

Simonson and Tversky note that experimental results involving tradeoffs where enhancement and detraction are likely to operate, will likely give 'less dramatic results' than conditions where polarisation or loss aversion are expected to dominate choice. They also suggest that detraction is consistent with the similarity hypothesis due to the similarity between options, while on the other hand, extremeness aversion helps explain enhancement.

Extremeness aversion

Simonson and Tversky's second principle, extremeness aversion, also describes context in choice. Their extremeness aversion proposal emanates from earlier work on loss aversion, where outcomes below a consumer's reference point (losses) are weighed more heavily than outcomes that are above the same reference point; gains (Kahneman & Tversky, 1979; Tversky & Kahneman, 1981; Tversky & Kahneman, 1991). Kahneman and Tversky's initial claims (Prospect theory, 1979) place the neutral reference point as the 'status quo' (Samuelson & Zeckhauser, 1988). The status quo is a point where there is a bias towards staying with the current option, a reference point with which the consumer is most familiar, rather than facing the possibility of making a mistake by choosing the wrong option, where mistakes are coded as a loss (loss aversion). However, by using the status quo as a reference point this limits its use to previous consideration experiences that must be recalled from memory, if such a memory exists.

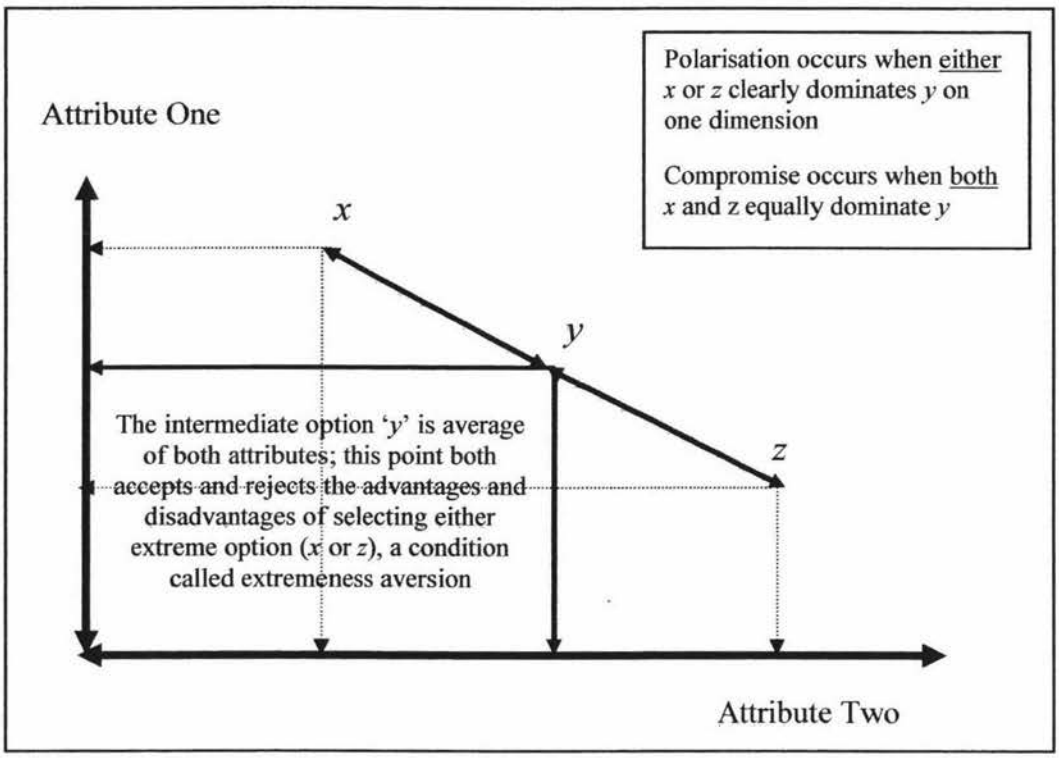
To help explain context in choice, Simonson and Tversky extend the notion of loss aversion to advantages and disadvantages between other available alternatives. This means that the notion of loss aversion no longer relies solely on some historic reference point, as loss aversion also can include comparisons between options, where one option acts as a point through which the other alternative options or attributes are evaluated (Tversky & Kahneman, 1991). Such a reference point recognises people do not have well established and clear preferences, but rather they construct these as and when they are faced with a need to do so (Payne et al., 1992; Simonson et al., 1993, p. 358). This view accepts that consumers often come to choice occasions unprepared to solve a choice problem; so, they have a tendency to make use of information readily available to them from local choice sets, where the immediate impact of information from these local sets can influence preference formation.

While Figure 5 can be used to describe extremeness aversion in terms of asymmetric domination and enhancement, it fails to clearly distinguish between choice conditions where the addition of one extreme option (x or z) to an existing pairing $\{z; y\}$ or $\{x; y\}$ will clearly dominate the middle option; an evaluation condition called polarisation. This is clarified in Figure 6.

This figure also depicts a tiebreak condition where the addition of either a higher (x) or a lower (z) extreme option to an existing pairing, $\{z; y\}$ or $\{x; y\}$, favours the selection of the intermediate option (y); this evaluative condition Simonson (1989) calls compromise. There is an expectation that compromise effects will occur when disadvantages of accepting either z or x tend to favour the acceptance of y.

Figure 6

An illustration of Polarisation and Compromise
Adapted from Simonson and Tversky (1992)



With polarisation, the evaluation and coding of differences between options as an advantage or disadvantage may also depend on which attributes are evaluated, for in some product categories price might be as important as quality. These price-quality tradeoffs are likely to create asymmetries in the evaluations of these attributes. Such asymmetries suggest that when a consumer becomes attuned to the importance of one attribute over other attributes during the tradeoff process, then this attribute tends to dominate during the comparison-making process, for it acts as the subject or reference point through which other attributes are compared (Houston et al., 1989, p. 122; Tversky, 1977). This means that the asymmetries between price and quality, and the direction of comparison made during tradeoffs, have important commercial implications. As tradeoffs are best explained by the concept of loss aversion, this concept has attracted considerable research attention. Flowing from this volume of research, a school of thought has emerged that proposes that higher priced, high quality brands take more share from lower priced brands than the reverse (Blattberg & Wisniewski, 1989). Simonson and Tversky also concur with Blattberg and Wisniewski,

that lower quality options lose more share than higher quality alternatives do (Simonson & Tversky, 1992). In the same vein, Heath and Chatterjee (1995) suggest it is easier to attract consumers to higher quality products than to lower quality products, although this may not happen in all market segments.

From the above, the corpus of opinion seems to indicate that when the opportunity allows, consumers have a tendency to select options that are higher in quality, and hence more expensive (usually), over options of lesser quality. However, Simonson, Nowlis, and Lemon (1993) challenge this proposal by saying that the reverse can occur when options are considered pairwise before making a final overall choice. They assert that choices between pairs of options can favour the lowest price, lowest quality option (z or y). An extensive search of the literature found no evidence to support such a claim. Although one possible explanation that might account for the phenomena described by Simonson et al., is to frame the low price, low quality options in such a way that it creates a bias towards selecting the inferior option (z or y) over that of higher price-quality options (y or x). As a case in point, in their research published in 1993, they appear to purposefully display options in formats that favour the selection of the cheapest lowest quality option in the two first displayed parings, $\{z; x\}$ and $\{z; y\}$, although they use $\{x; y\}$, $\{x; z\}$ and $\{y; z\}$ combinations in their stated hypothesis. In what is a confusing paper, Simonson et al. also mention that the first displayed pairing was designed to expose consumers to a 'the range of values on both attributes' (Simonson et al., 1993, p.367). It is possible that by framing extreme attributes in this way, it is more likely to enhance the effects of framing in the first pairing as the difference between attributes is maximised; this may highlight the extremeness of those options. As for framing in the triple set, such framing effects are less obvious, as evidenced by the weakness of such effects in larger, more than two options, choice sets (Dhar & Simonson, 1992; Duffy, 2003).

The use of framing also appears to be part of Simonson et al. (1993) experimental methodology to demonstrate that preferences are formed early during choice. While their methodology is not clearly outlined in any detail, they appear to purposely bias initial selections so they favour the selection of low quality over high quality in the initial pairing. In other words, at the first pairing the choice decision is purposely framed to favour the selection of the frugal option, over that of taking a less thrifty

approach to selection. Having biased the first pairing towards the lowest price-quality option, then there is an expectation, if the early formed preferences are to survive, that the preference for a frugal option will flow through to be the most preferred option in the final triple choice set. As there are three selection hurdles to overcome, two pairs and a triple set, it seems reasonable to expect that any early formed preference will weaken as other options poach share from it as the consumer considers other choice sets. The effects of the following pairings on final choice require further research. One possible area of research would be to measure the correlations between the option chosen in each pairing and the options selected in the final triple choice set. However, such analysis does not form part of this thesis.

To summarise the principle of extremeness aversion; in paired sets $\{z; y\}$, $\{x; y\}$, or $\{x;z\}$, neither option is more extreme than the other, however, in triple sets ($\{x \mid y \mid z\}$) extremeness does apply due to the effect of the middle option (y) on either x or z. As consumers are more adverse to a loss of quality than having to pay more to obtain that quality, there is a general shift towards a higher quality options. This shift favours both x and y at the expense of z. As not all consumers are prepared to accept the very highest quality option, some consumers remain with the middle option as they are more price sensitive in having to pay for the extra quality. With the combination of some original consumers still favouring y, and that there is a high possibility that preference share moves upwards from the lowest quality option z, then this means the intermediate quality option gains more share relative to the highest quality option x.

Simonson offers an alternative explanation for the effect of context on choice with his compromise effect (Simonson, 1989). This alternative explanation involves a 'best reason' scenario, which Simonson says can help break the impasse between the advantages and disadvantages of selecting between the two extreme options, x or z, over that of the middle option y. While Simonson acknowledges there are potentially many reasons involved in making a choice, he contends that consumers find reasons for selecting or rejecting options presented to them. He seems to be suggesting that these reasons are traded off like attributes to arrive at a single best reason that supports the selection of one option over other options. This notion of choice by 'best reason' suggests that attributes of the options considered might at times only play a secondary role in choice, for consideration can include reasons distant to that of attribute tradeoffs,

such as having to justify the choice to others (Simonson & Nowlis, 2000). One advantage of Simonson's best reason approach is that not all options can be represented quantitatively (dimensionally), which means some options are best considered qualitatively by matching features of the options. However, the difficulty with such psychological explanations is that these cognitions are unobservable, so evidence of the 'best reason' approach must rely on overt behaviour such as verbal protocols (Ericsson & Simon, 1993).

In sum, the portrayal of the asymmetric effect is a dichotomy. On one hand choice involves accepting the attribute that is likely to result in a suffering a loss of some kind, while on the other hand the chance of accepting a different attribute which provides a gain to the consumer in some way. Earlier it was hypothesised that consumers place greater weight on evaluations involving loss over that of accepting a gain, so, in general, consumers are loss averse. If during consideration two of the considered attributes happen to be price and quality, this is likely to create a propensity towards favouring decisions based on quality over that of price, as forgoing a choice based on quality means the loss of enjoying the benefits expected to flow from an increase in quality. By contrast, there is an opposite, but not equal reaction to the loss of money required to pay for increased quality, ceteris paribus. If such a bias towards quality over price exists, then it is reasonable to expect that in a competitive environment, higher priced, higher quality brands will take more share from lower priced, lower quality brands rather than the reverse (Blattberg & Wisniewski, 1989), but it is uncertain if this happens in practice.

Empirically based patterns of choice

This final part of this literature review differs from earlier sections, which attempted to explain individualised choice behaviours based on psychological constructs such as loss and gain. Arguably, a more useful approach than trying to understand how consumers make choices is to analyse actual sales data in the search for systematic patterns of choice, then, once identified, trying to provide explanations for such patterns. This approach makes sense for marketing managers who are mostly concerned about aggregated results of choice behaviour, not so much individualised accounts of choice.

In the previous section on asymmetrically induced effects, many researchers used the concept of loss aversion to support and explain their findings, however, there is growing evidence that such a reference-dependant account of choice fails to generalise across all choice situations - if it operates at all. This is concerning, as loss aversion or as it is often called the reference dependant model of choice, is the mainstay theory that underpins the greater bulk of research on paired comparisons and the effects these have on final choice. If the referent dependant model of choice operates at the micro level, then there should be evidence of such a theory at a macro level.

Counter claims to the concept of loss aversion

In many competitive markets, there is a constant churn of consumers switching backwards and forwards between brands. These switchers include regular users who purchase more than one unit of a brand 'A' at a time, those who buy single units of 'A' over multiple occasions, and consumers who buy brand 'A' occasionally, but also buy brands 'B' and 'C'. While not explained in this review, it is possible to show that over time the market share for options 'B" and 'C' relative to option 'A' are fairly static (Ehrenberg, 1997). In sum, apart from occasional changes in share due to promotions or the vagrancies of consumer purchase, small-share brands are likely to remain small-share brands. For this reason, when measuring consumer preferences for a set of brands, then it is likely those preferences will be similar to the market share enjoyed by those brands. It goes to say, when consumers are exposed to some form of experimental treatment in a micro setting, such as first viewing options in pairs before selecting the same options again when viewing them globally, then the shares of those options should be a reflection of market share, unless some treatment effect has changed that share.

When there are major deviations to this market share pattern, then it is possible that such deviations are due to certain brands competing more fiercely with each other. Such excessive competition helps partition these brands as different in some way from other brands (Ehrenberg, 2000). Under such competitive conditions, brands that compete asymmetrically must contend with the reality that some firms have 'more effective marketing strategies, or more effective organisations implementing those strategies, than others' (Carpenter, Cooper, Hanssens, & Midgley, 1988, p.394). This means that any competitive edge a retailer can gain at the micro level, still requires management to implement such micro strategies at the macro level, if they are to

improve brand share. How such firms compete against each other, may provide a better explanation for market share change than the concept of loss aversion.

The loss aversion concept also fails on two other accounts. First, there is ample evidence in many markets that the concept of gain or loss does not necessarily extend to brand share size, for there are many low price-quality brands that have a larger share of the market than higher price-quality brands do. Second, Bronnenberg and Wathieu (1996), and others (Dawes, 2005), show that in competitive market there are as many consumers who are as likely to switch up from lower priced brands to higher price brands, as there are that switching down from high price to lower price brands. While the loss aversion model might be a useful theory to help explain choice at the local set level of choice, it fails to explain why certain brands defy its predictions at the operational or macro level.

Issues of heterogeneity

While there are supporters who contend that loss aversion causes competitive asymmetries (Heath et al., 2000), there are others who ridicule the loss aversion explanation of choice for its failure to account for heterogeneity. Here heterogeneity means the differences between consumers and the way they responded to price or quality (Bell & Lattin, 2000). In Blattberg and Wisniewski's (1989) original study, the authors were quick to point out that both 'quality' and 'economy seekers' exist within most populations, although it is likely there are fewer economy seekers than those who seek quality. They suggest more price responsive consumers have lower reference price points, than less price responsive consumers who have higher price reference points. Further, consumers with high price reference points face smaller losses than do consumers with lower price reference points who consider options above their established price reference points. As a result, price responsive consumers face more prices above their reference point than do the less price responsive consumers, who see more prices below their price reference point. This means there should be a larger pool of consumers who are prepared to pay more for higher quality goods than a pool of price responsive consumers who must pay above their price reference point to gain higher quality goods. On the other hand, price sensitive consumers can change their reference point to a higher (lower) price reference point, although this change is harder to make for price sensitive consumers who want to shift up in price-quality than it is for

less price sensitive consumers to shift down in price-quality (Kahneman et al., 1991). If correct, then any cross-sectional samples used to model choice require adjustment to account for such differences in consumer price-quality sensitivities. Failure to make this correction can bias results upwards to such an extent it favours finding evidence of loss aversion, when no such effect may exist in the sampled population (Bell & Lattin, 2000). Having said this, Bell and Lattin accept there are some product groups where consumers may be less sensitive to price than others are. From the literature it seems the advice offered to researchers is, they need to account or control for differences between consumer characteristics during sampling and, or, before analysis by using weightings to balance such characteristics. Due to space, a summary of some important choice patterns, related to specific consumer characteristics, is in Table 1.

Table 1

Summary of major choice patterns in aggregated sales data

Data Analysis	
Unobserved heterogeneity Certain context effects can result from the aggregation of two (or more) consumer segments that do not exhibit these effects when considered separately.	(Hutchinson, Kamakura, & Lynch Jr., 2000)
It is possible to identify the underlying determinates of brand switching probabilities and aggregate response to price changes in terms of price elasticities, as based on consumer perceptions of the price-quality relationship.	(Kamakura & Russell, 1989)
Income and effects linked with price and quality	
Higher price, higher quality brands steal share from other brands in the same price-quality tier, as well as the tier below. However, lower price, lower quality brands take sales from their own tier and the tier below brands, but do not steal significant share from above tiers.	(Blattberg & Wisniewski, 1989)
Loss aversion helps explain asymmetric responses to changes in product characteristics. Loss aversion is often termed the reference-dependent model of choice.	(Hardie, Johnson, & Fader, 1993; Simonson & Tversky, 1992; Tversky & Kahneman, 1991)
Consumers tend to favour higher priced brands if it is of higher quality than lower priced brands.	(Bronnenberg & Wathieu, 1996)
Buyers are often uncertain about the quality of products, and depending on income level and the need for the product, consumers are willing to pay different prices for goods of different quality.	(Stoetzel, 1954)
Economic factors such as interest rates, unemployment, and economic growth have considerable influence on price knowledge.	(Estelami, Lehmann, & Holden, 2001)

Higher incomes favour the choice of superior (higher quality) brands over inferior (low quality) brands.	(Allenby & Rossi, 1991)
While brand substitution might be higher for low share brands, category expansion due to price cuts may be higher for high share than low share brands, as a drop in price makes higher quality brands more affordable.	
Higher income households are less price sensitive, while large families are more sensitive to price.	(Ainslie & Rossi, 1998)
Purchase activity	
Loss aversion may not be a universal phenomenon in the context of frequently purchased grocery products.	(Bell & Lattin, 2000)
Households that visit the store frequently are often more sensitive to price. Households that buy a wider variety of items during a single purchase occasion (large basket shoppers) are less sensitive to price. Large user households tend to be both less sensitive to price and less sensitive to displays than small user households are.	(Ainslie & Rossi, 1998)
Consumers who purchase frequently or purchase large volumes of product are more sensitive to price and have more sharply defined preferences for national brands than consumers with low frequency or low volume purchases.	(Kim & Rossi, 1994)
Consumers that have low familiarity or are highly familiar with a product, tend to perceive a stronger price-quality relationship than do subjects who are only moderately familiar with the same product.	(Rao & Monroe, 1988) (Simonson, Huber, & Payne, 1988)

Effects of gender, income, and age on choice

While the effects of price and quality on choice has received considerable attention, the effects of gender and various age groups on choice has received less interest (Gunter, 1998; Yoon, 1997). This lack of research, as it affects marketing, is surprising in light of an aging society where consumers 65 years and older are expected to constitute a quarter of New Zealand's population by the late 2030s, compared to 12% in 2005 (Statistics`(NZ), 2006). As the percentage of older consumers increases, compared with younger consumers, it is likely that such changes will affect the characteristics of households. For example, household income, where people live, or the number of consumers in each dwelling; it is projected there will be a decline from 2.6 people per household down to 2.4 over the next 15 years (Statistics`(NZ), 2006). These fundamental changes have important implications for sampling in the future.

One possible reason for the lack of reported research into the effects of gender and age on choice, is that such measures are often included in some other more parsimonious measure, such as income. However, as already mentioned, unaccounted for heterogeneity in sampling can bias results. A good example of the influence of age on

choice can be seen in Ainslie and Rossi's (1998) study into choice behaviour across product categories. Using household scanner panel data sets and a variance component approach that provided an estimate of sensitivity to marketing mix variables (price, product, location and display), they show that older 'retired' consumers are strongly sensitive to price (*r* .74). In an unrelated study into the shopping behaviour of low-income senior United States of American citizens, the day and time of shopping, amongst other things, showed respondents preferred to shop in the morning, purchase from chain stores, and they tended to rely on physical search for product information (Mason & Smith, 1974).

It also appears that older people reach their peak mental performance in the morning, while younger adults reach a peak in the late afternoon or evening (Yoon, 1997). Also related to choice is the estimation of elapsed time. Time estimation is important in memory as it is involved with coordination of movement and the judgement of events. It does seem that the estimation of elapsed time is shorter for older consumers than for younger consumers (Carrasco, Bernal, & Redolat, 2001).

While it is widely accepted that cognitive abilities change with age, how such changes effect choice is less clear. For example, it is unknown if there are choice differences between young and older subjects when considering pairs of options before making a final choice from a triple set of the same options; although it does appear that both middle-aged and older consumers tend to use global rather than local choice strategies (Rozencwajg et al., 2005).

The effects of different gender on choice often appear as unimportant to most researchers, as during sampling they seem to report that they 'tried to balance the number of males with females'. The assumption the reader is left with is that such a sampling strategy has averaged out, or reduced the confounding effects of gender in their experiments. Overall, the literature of gender effects on choice is sparse. The literature that does exist takes a mental processing approach, such as females are more concerned with the details of a promotional message than males are (Meyers-Levy & Maheswaran, 1991). There is considerable scope for new research into the effects of gender and different age groups on choice.

Conclusion and the reason for new research

While the literature reviewed is broad in both application and theory, there are gaps in the knowledge about the antecedent effects of paired choice on final choice. In one piece of research, Simonson et al. (1993; also Simonson & Tversky, 1992) have attempted to replicate how consumers might choose between three similar options that differ in terms of price and quality. They suggest that when a consumer seriously considers options, they do so by comparing those options in a series of paired comparisons. The manner in which these pairings or local choice sets are evaluated can influence local preference, which in turn influences final choice. What is important about a claim made by Simonson et al. (1993), is that by comparing options in pairings before making a final choice tends to favour the selection of lower priced-quality options, more so than the reverse. That is, higher price-quality options lose share to lower price-quality options. If this claim can be substantiated, it would be useful to retailers who wish to promote lower price-quality brands against other retailers who are promoting higher price-quality brands. However, the Simonson et al. claim goes against the evidence and theory presented in the literature review. Most authors, Simonson and Tversky included, suggest there is a tendency for consumers to shift up in quality rather than down in quality, when it is possible for them to do so. This upwards shift also includes price, for price is often associated with quality. One reason for this price-quality association is that more features or greater reliability (quality) costs more to produce, so price must increase to pay for this added quality. As the claim made by Simonson et al. (1993) is contrary to the corpus of opinion on choice, their claim needs retesting, while controlling for the effect of heterogeneity in the samples. As consumers are different, mostly, it is reasonable to investigate how gender, household income, or the difference between ages effect choice. More in particular, how do these background factors influence stepwise choice and the early formation of preference?

For the above reasons, it was decided to investigate Simonson et al (1993) claim, and while doing so, test for the effects that gender, household income, and age has on paired-choice before final choice. New research in this field will help fill another gap in the puzzle about how consumers form preferences, and the role preference plays in final choice. This research has important implications for the retail industry. The direction and the goals of the new research follow on the next page.

RESEARCH OBJECTIVES

The overall objective of this study is to examine the changes in preference share of three differing options due to the manner of presenting those options. This thesis examines the following hypotheses.

Hypothesis 1 (H_1)

Consumers who make paired comparisons of alternatives that vary in price and quality before selecting from a triple set of the same options are more likely to choose the cheapest option, than those who evaluate just the triple set comprised of the same options.

Hypothesis 2 (H_2)

A difference in gender will not change the effects of H_1.

Hypothesis 3 (H_3)

A difference in respondents' household income will not change the effects of H_1.

Hypothesis 4 (H_4)

A difference in respondents' age will not change the effects of H_1.

METHOD

Experimental design

To test the hypotheses, four experiments using face-to-face interviews with 444 respondents were conducted during the middle of 2005. The first three experiments used three different product groups, with three different brands and price-quality levels. The fourth experiment replicated the first experiment, but used a different presentation order for the options.

The purpose of each experiment was to compare the choices under two conditions, separately labelled as Step and Sim. Under the Step condition, respondents chose one option from a sequence of three paired options before making a final choice from all the same options when displayed as a single triple choice set. In all, respondents under the Step condition made four separate choices. Under the Sim condition, respondents were only asked to choose one option from the same triple set viewed by respondents under the Step condition. This Sim condition acted as control.

To assist presentation, the letter 'E' replaces the word experiment when it is appropriate to do so, experiment one is E1, experiment two E2, and so on.
To balance respondents' exposure to Step and Sim treatment conditions, each respondent was randomly assigned to one of eight groups, with each group exposed to a different set of experimental conditions and treatments. Respondents in the first four groups were involved with E1 to E3, while the balance of respondents in the other treatment groups only receiving E4. Respondents who received treatments in E1 to E3 came from a separate sample than those involved with E4. For each respondent in E1 to E3, the Step and Sim conditions changed between experiments, so a respondent who made choices under Step conditions in E1, went on to selected an option under Sim conditions in E2, for E3 conditions were reversed. Similarly, respondents starting under Sim conditions in E1 changed to Step conditions in E2, then back to Sim in E3. No rotation was required for E4, although 40 respondents who received E4 also received E3 as a way of increasing the sample size in E3.

An important difference between E1 and E4 was the sequence used to display the same options. E1 replicated the experiments of Simonson, Nowlis, and Lemon (1993) and that of Brennan and Laafai (2003a; 2003b; Laafai, 2002), where Step pairings were displayed as {A, C}, {A, B}, {B, C}in both studies, and {C, A}, {B, A}, {C, B} in Brennan and Laafai's experiment. The triple sets were either {A, B, C} and, or, {C, B, A}. In E4 the first pairings were displayed as {B, C}, {B, A}, {A, C}, or {B, A}, {B, C}, {C, A}; triples as {B, A, C} or {B, C, A}. The intention in E1 was to display the full range of attributes for each option in the first pairing, while E4 exposed attribute values progressively by displaying the middle option first. For convenience, and in recognition of possible valuation differences, E1 to E3 have been subtitled the 'full-range-first' experiments, while E4 is subtitled the 'middle-option-first' experiment. Figure 7 summarises the experimental design, and an edited version of the questionnaires used to record results provides detail of the treatments and conditions used in each of the eight treatment groups, see Appendix C.

The attributes of each of the nine options were described in terms of price and quality; where the quality of the three wristwatches used in E1 and E4 was expressed by the brand name; Seiko, Citizen, and Casio. E2 used two-slice electric toasters described by brand, price and three differing features. The test products in E3 differed from those in previous experiments, as they were real ballpoint pens instead of graphically displayed options in text. To improve the realism of the choice task in E3, consumers were actively encouraged to use the pens.

The evidence of any treatment effect was a change in an options total share, with chi-square tests indicating the statistical significance of these changes. To test each hypothesis, the analysis of results compared the combined shares of both the highest and intermediate priced option (A + B), then compared this combined share with that of the preference share of the lowest priced option 'C' (A+B, C). To support the hypotheses there was an expectation that after application of the Step treatment, option 'C' will have a higher share than the same 'C' option in the Sim or untreated group.

Following the completion of experiments, the interview session ended with a series of questions that asked for the combined before-tax income of all the people in the respondent's household, and when the respondent was born; birth date provided the

consumers age and observation determined gender. The information collected from respondents on gender, household income, and age helped measure the effect of these background factors on choice (H_2, H_3, and H_4). This same information helped determine the weightings required to balance choice results between the Step and Sim groups, in an attempt to account for heterogeneity within the samples taken.

Figure 7

Experimental design overview

	Step Group *Viewed pairs then triples*		**Sim Group** *Viewed triples only*	
	Treatment presentations		**Presentations**	
Experiment 1 *Wristwatches*	**ABC**	**CBA**	**ABC**	**CBA**
First pairing	AC	CA	X	X
N = 244	n = 61	n = 61	n = 61	n = 61
Experiment 2 *2-slice toasters*	**CBA**	**ABC**	**CBA**	**ABC**
First pairing	CA	AC	X	X
N = 244	n = 61	n = 61	n = 61	n = 61
Experiment 3 *Ballpoint pens*	**ABC**	**CBA**	**ABC**	**CBA**
First pairing	AC	CA	X	X
N = 284.	n = 71	n = 71	n = 71	n = 71
This experiment includes 40 respondents who had been exposed to E4 first				
Experiment 4 *Wristwatches*	**BAC**	**BCA**	**BAC**	**BCA**
The same as in E1				
First pairing	BC	BA	X	X
N = 200	n = 50	n = 50	n = 50	n = 50
Respondents used in this experiment were separate to those used in E1 to E3, with the exception of 40 respondents who went on to complete E3.				

Note: The attributes of each are summarised as:
A = option with the highest price; B = option with a middle price; C = option with the lowest price.
The same letters represent high, medium, or low quality, respectively.
For all presentation sequences and group crossovers, see the questionnaires in Appendix C

Interview procedure

All experiments involved the use of a one-metre high table and a computer monitor on which was displayed instructions, questions, and the test options. The screen of the monitor was arranged so it was clearly visible from the street, in recognition that respondents would be less willing to participate in the experiments if they became 'disconnected' from the public footpath area. The maximum distance from the street to the display monitor was never more than two metres. No difficulties were encountered

during fieldwork with the display apparatus, deliver of the test options, interacting with consumers, complying with the requirements of council officials, or interrupting the everyday operations of neighbouring businesses.

Following intercept respondents were escorted to the display monitor, at which point they were informed what was expected of them by way of a series of slides. These slides informed the respondent that the Department of Marketing at Massey University was conducting the research, the type of information collected, and who would have access to the data. Throughout the slideshow the interviewer also vocalised the important parts of each slide, but not the choice options. A copy of the opening preamble used is included in a complete PowerPoint slide show in Appendix F. Further, should subjects have wished to read it, a general information sheet outlining the purpose of the study was made available. Copies of city and regional council consents to intercept consumers on the footpath were also visible. All these documents, along with letters acknowledging the assistance given by various property owners, council officers, and others are in Appendix B.

Following the introduction phase, the respondent went on to view the appropriate choice options for each experiment, were asked their date of birth and the aggregated before-tax income of members in their household, thanked for their assistance, and finally asked not to tell others about the products or the questions shown to them. During the session the interviewer recorded respondent responses on a pre-printed sheet that mirrored the order of the options viewed and questions asked; an edited version of all the recording sheets used for E1 to E4 are in Appendix C.

As fieldwork took four months to complete, it was possible that a change in the retail environment might have an effect on product choice. For this reason a constant check was maintained on the retail activity of nearby retail outlets, local newspapers, and home delivered brochures; no unusual retail activity was noticed during the four-month period.

Test product selection procedure

In recognition of the importance product type and the information displayed can have on choice, three product types represented by nine different brands were used to test the hypotheses. An overview of the products and brands used in the experiments follows, while separate sections outline each in detail.

		A Highest Price-quality brand	**B** Intermediate Price-quality brand	**C** Lowest Price-quality brand
Experiment one	Wristwatches	Seiko	Citizen	Casio
Experiment two	Electric toasters	Sunbeam	Russell Hobbs	Breville
Experiment three	Ballpoint pens	Pental	Pilot	Stabilo
Experiment four	Wristwatches	Seiko	Citizen	Casio

To assist with description and commentary throughout both studies, use is made of the following nomenclature; 'A' is an option with the highest price and quality, 'B' an option with intermediate or middle price and quality, while 'C' refers to the lowest price, lowest quality option.

Experiment 1 and 4 - Wristwatches – selection of price and brand information

E1 and E4 used the same wristwatch brands and prices. In line with the studies of Simonson et al's (1993) and Brennan and Laafai (2003b; Laafai, 2002), the current study also uses Seiko, Citizen, and Casio wristwatch brands as test products, as these are available in both the United States of America and New Zealand. The prices displayed in the current study are the same as used by Brennan and Laafai, who 'updated' the asking price from the original study of Simonson et al (1993) to make them more relevant to New Zealand respondents, see Table 2. While the difference between Simonson et al. price is $15, the test options are doubled this ($30). It was thought this price separation would be sufficient to clearly separate each option, while at the same time recognising that price range could induce consumers to evaluate brands differently than in Simonson et al. (1993) study. This risk was accepted in light of differences in exchange rates ($US v $NZ), inflation, and the elapsed time (13 years) between Simonson et al's (1993) initial experiment and that of Brennan and Laafai's

replication. All previous experiments used prices ending in '9' (Seiko US $59.99; NZ $189), this convention was maintained in E1 and E4 as price endings can convey information about quality, image, and value (Gendall, Fox, & Wilton, 1998; Ginzberg, 1936; Schindler & Kirby, 1997; Stiving, 2000).

Table 2

Product comparisons between wristwatches used in experiment 1 and 4

	Simonson, Nowlis, & Lemon (1993) $	Brennan and Laafai (2003) $	Price used in this study (2005) $ (GST inclusive)
A Seiko	59.99	189	189
B Citizen	44.99	159	159
C Casio	29.99	129	129

Subjects were informed that all wristwatches have day date indicators, leather straps, and are water-resistant

Recognising that price is sometimes used by consumers as a proxy for quality, it was thought best to check on this by asking E1 respondents to rank the quality of the watches they had just considered by using a 3-step scale; from high to low quality. This ranking was made without the assistance of price (n = 244). Initially this ranking task was not intended to form part of this thesis, as it was designed to check if the price-quality relationship was holding. The wristwatch rankings are in Table 3.

Table 3

Post-choice rankings of quality in wristwatches (%)

	Highest Quality	**Middle Quality**	**Lowest Quality**
Wristwatches			
Seiko	**95**	5	0
Citizen	**59**	**39**	2
Casio	**26**	**29**	**45**

Respondents (n = 244) were asked:
First question, *Thinking about wristwatches, which of the following do you think has the highest quality?*
Second question, *Which wristwatch do you think has the lowest quality?*

As Table 3 shows, the assumption that Casio is the lowest quality wristwatch is questionable due to its mixed quality rankings, for only 45% of respondents though it belonged in this position. The Citizen brand was expected to act as a middle-on-all-attributes option, but rankings disagreed with this. If Citizen was of average quality, then it should rank high in this category and not in others, yet the rankings show that Citizen only averaged 39% for middle quality, while 59% of respondents considered it high in quality. Overall, it is uncertain how respondents viewed quality during the experimental sessions, as these rankings provide post-choice, not pre-choice evaluations of quality.

As brand name was intended to be an indicator of quality, a check was also made on the overall brand knowledge of respondents in regards to wristwatches (n = 244). In another post-choice question, respondents were asked, 'Without looking - what brand of watch are you wearing now'. It was expected that respondents' would have a reasonable idea of the brand of watch they were wearing at the end of their arm, and that this would act as a fair indication of brand awareness. Results showed that 37% of respondents had no idea of the brand they were wearing at the time of interview, 30% knew, and 33% did not wear or were not wearing a watch. This suggests that the branding of wristwatches, once owned, may not be an important indicator of quality as assumed in the choice results of E1 and E4.

Experiment 2 - Electric toasters – selection of price and brand information

A requirement in the second experiment was a test product that was both familiar and easily purchased by all age and income groups in the tested population. This eliminated expensive items such as fridges and television sets, where purchase might involve financing arrangements or the need to tap into a different decisional framework than that used for less risky purchases. For this reason, electric toasters were considered a good test product. To help define the information given to respondents and to ensure it was useful and relevant, a survey of local retailers helped in the selection of suitable brands, prices, and descriptions. The full details of this survey are contained in Appendix D, while Table 4 gives a summary of the brands and features used in E2.

Table 4

Product comparisons between two-slice electric toasters used in experiment 2

	Price $	Cord storage CS	Cool Touch sides CT	12 month warranty or guarantee
A Sunbeam	79.95		X	X
B Russell Hobbs	69.95	X	X	
C Breville	59.95	X		X

X = toaster has these features

A check was also made on the quality of toasters by ranking these in the same way as described in the ranking of wristwatches (n = 244). Looking at Table 5, Russell Hobbs was ranked as the highest quality brand (80%). This was surprising as this option did not carry a guarantee, yet it still obtained a high rating. There was an expectation that a guarantee would operate as a quality indicator, but it clearly it did not do so post-choice. It is possible that the high quality ranking obtained by Russell Hobbs is due to its reputation as a brand, for noticed during fieldwork, subjects often commented that Russell Hobbs 'had a good name', while Breville sounded like a 'foreign name'. As the Breville brand is relatively new in New Zealand, fewer consumers would know about this brand compared to the long established Russell Hobbs and Sunbeam brands.

Table 5

Post-choice rankings of quality in electric toasters (%)

	Highest Quality	Middle Quality	Lowest Quality
Electric toasters			
Sunbeam	**64**	**31**	5
Russell Hobbs	**80**	18	2
Breville	**27**	**23**	**50**

Respondents (n = 244) were asked:
First question, *Thinking about toasters, which of the following do you think has the highest quality?*
Second question, *Which toaster do you think has the lowest quality?*

Experiment 3 - Ballpoint pens – selection of price and brand information

The intention of E3 was to provide the respondent with 'complete' information about the quality of choice options by using real ballpoint pens, instead of displaying options in text as in previous experiments. Ballpoint pens were considered an ideal test product, as they are easy to display and use by the respondents. As real product was used, the size of the test object was also important for operational purposes, as there were up to eight different choice sets to display; six separate paired options and two triple option sets. To ensure the experiment was as realistic as possible, a small pilot study helped isolate three distinct price levels and three distinctive physical differences between the pens. The physical nature of the pens was important, for they needed to provide an indication of quality on three separate quality levels, high, medium, and low quality. Details of the pilot study used to determine attributes is in Appendix E, while Table 6 outlines the obvious attributes of each pen along with its price.

Table 6

Obvious product attributes of ballpoint pens used in experiment three

	Price $	Body and extras	Nib retraction	Rubber grip	Pen weight
A Pental	4.10	Solid Silver tip	End	Yes	Heavy
B Pilot	3.10	Solid	End	Yes	Medium
C Stabilo	2.10	Clear	Side	No	Light

Ink and ball width: Pental 1mm dark blue; Pilot 0.4 mm medium blue; Stabilo 0.4 mm light blue

Measurement of background effects on choice

To order to test H_2, H_3, and H_4, it was first necessary to divide gender, household income, and age factors into subgroups. This was necessary for two reasons. First, to control for each of these factors separately to determine the effect each factor has on choice under both Step and Sim conditions, and second, to account for the effects of heterogeneity within the Step and Sim treatment groups. Without balancing for respondent characteristics such as gender, household income, and age, it is possible that when experimental results are combined, this may indicate that a treatment effect has

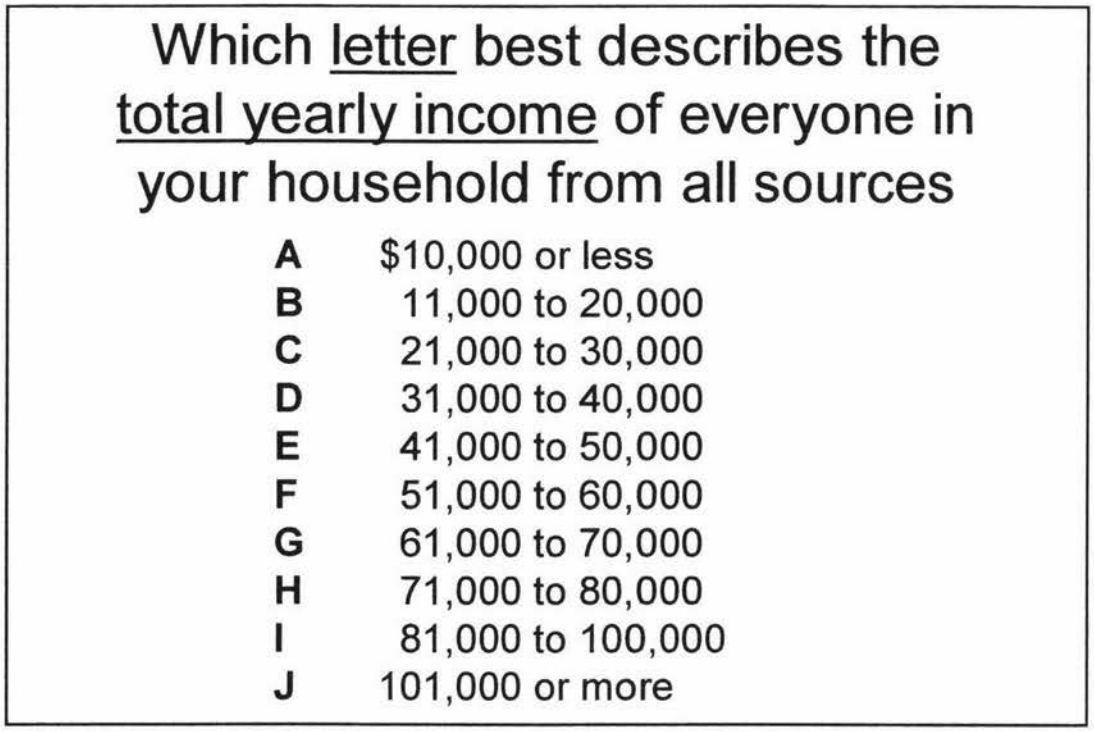
above background factors on choice required weighting of the results. While dividing consumers by gender only involved observing the obvious, the separation of consumers by household income and age is problematic.

Determination of gender and household income - procedure

To enable the measurement of household income it was first necessary to establish household income levels, before embodying these into a table for presentation to consumers. In Brennan and Laafai's study, four levels recorded the subject's own yearly before-tax income from all sources. However, the current study used ten before-tax household income levels. The before-tax value was considered more helpful to respondents than an after-tax amount, as taxation is a complex issue for some consumers and the after-tax income may have raised an element of uncertainty about their own, or the income of others in the household. The household income measure was preferred over personal income, for it was felt that the purchase of electric toasters was more likely to be a household expense, unlike a personal expense involved in purchasing a wristwatch or pen. Acknowledging that other measures of spending, such as disposable income, might also have been suitable, this was of little concern for this study was not so much interested in the accuracy of income, but rather using household income as a rough index of spending power to enable the division of consumers into one of three income groups prior to analysis. Figure 8 shows the household income levels presented to consumers. During the household income question, the interviewer verbally informed subjects that the income levels shown on the slide were before-tax. The few consumers who refused to answer the income question were handed the recording sheet to complete before placing it in a sealed box. Of all the respondents, only three used this option.

Figure 8

Household Income levels - slide presented to respondents



Determination of age - procedure

The age of each respondent was determined by asking for the year born. Year born was preferred over that of asking for age, as sometimes people forget how old they are, but their year of birth remains a constant value. Following aggregation of the various ages each respondent was labelled as belonging to one of three age groups, see Table 8.

Instruments

Treatment application

The instruments used in the current study differed to those of Simonson et al. (1993) and Brennan and Laafai (2003a; 2003b; Laafai, 2002). Simonson et al. used sheets of paper on which the various options were printed and distributed to undergraduate marketing students in a class setting or to visitors at a science museum in the United States of America. The visitors received two dollars for participating. The respondents completed the questionnaires themselves. On the other hand, Brennan and Laafai used an interview technique in the university city of Palmerston North, where four different interviewers positioned in central city shopping locations randomly selected members of

the passing public. In Brennan and Laafai's study, subjects received a set of show cards on which was printed the appropriate choice set of options, instructions, and the questions asked. Once a respondent decided on an option, the interviewer recorded this response then instructed the respondent to flip the showcard over for the next choice set, and so on.

In the current study a similar technique to Brennan and Laafai was used, but unlike previous studies all the questions and options were displayed on a 14-inch stand-alone computer monitor using PowerPoint presentations, with the interviewer controlling the speed of the displays, frame by frame. As the interviewer controlled the transition of each slide, this accommodated for fast and slow choice makers. In addition to the visual display, the interviewer also voiced essential parts of each slide, but not the options. Using the monitor to display options eliminated the need for subjects to fill in their own forms (Simonson et al.) or to ask the subject to turn over cards as in Brennan & Laafai's study. The only physical involvement required by the subject was to handle the ballpoint pens in E3, if they wished. Overall, it was felt this method of presentation was easier for subjects as it better reflected everyday choice conditions, and helped the respondent to focus on choice making rather than worrying about the mechanics of card flipping or paper shuffling.

Early in the design of the experiments it was realised that the manner or format in which options are displayed can affect choice (Haber & Hershenson, 1973). As both Simonson et al., and Brennan and Laafai portrayed wristwatch options vertically, this format was used in E1 and E4. However, the toaster displays in E2 were more complex, as they provided information on brand, price, and two features. For space reasons toasters were displayed horizontally. In a further attempt to limit distractions and present a standardised approach to choice, all options and instructions were displayed against a neutral background colour, with price and brand shown in black 15 to 25 mm high (60 to 80 mm font size in PowerPoint) Arial style lettering. This type size was considerably larger than that used by Simonson et al. or Brennan and Laafai.

To facilitate operations, while still providing a seamless presentation of the choice sets, all the experiments, their treatments and conditions, along with questions and instructions were arranged together in a looped PowerPoint presentation. Once this

loop started it controlled the presentation order of all the experiments, the composition of the various choice sets, and crossovers between Step and Sim treatment conditions required for eight separate interview sessions. That is, one loop contained everything required to treat eight different respondents separately. For an illustration of the first set of slides in the loop of eight, see Appendix F.

The third experiment differed from earlier experiments by its use of actual ballpoint pens. To facilitate presentation of these pens the various option sequences were pre-arranged on eight white, oblong, display boards measuring 22 by 12 centimetres. At the top of each card, printed in 12 millimetre high lettering, was the identification letter for each pen (A, B, or C), with brand and price shown at the bottom in smaller 9 millimetre high lettering. A small and unobtrusive plastic clip held each pen in place, yet this clip still allowed easy removal of the pen when the subject wished to test each option. To help focus the subjects attention on the ballpoint pen array, as well as to standardise lighting conditions throughout the various sessions and different locations, a 20-watt halogen lamp illuminated the display boards.

Sampling

The subjects involved in all four experiments came from a random intercept of 644 consumers aged 18-years and over, taken from high-street locations in both rural and urban communities in Taranaki. These intercepts resulted in 444 successful interviews, giving a 69% response rate. To avoid bothering consumers and needlessly increasing the refusal rate, the interviewer did not approach groups containing more than four members, or individuals clearly in hurry. Interviews usually started around ten o'clock in the morning and continued until three in the afternoon. In total, there were 14 daily sessions. The sampling period extended over four months, from 20 May to 19 August 2005 (New Plymouth 20-28 May; Stratford 1-3 June; and Hawera 16-19 August). A dot plot in Appendix G shows the spread of intercept times. The average time taken for each interview ranged between four to six minutes, depending on the treatments applied. A single interviewer completed all intercepts, and neither consumers nor the interviewer received any compensation for their effort.

As respondents were intercepted randomly, it was always likely this would result in the selection of an unbalanced sample in terms of gender, household income, and age. In an attempt to rectify this, a running total was keep of gender and age so at the next interview session attempts could be made to correct the imbalance by favouring the selection of one gender or age group over another, whenever possible. However, this turned out to be more difficult than expected, for in all high-street locations there were fewer males, particularly young men, than females. Even with a bias towards selecting males over females, this still resulted in a 10 percent imbalance between genders, where females 245 (55%) outnumbered males 199 (45%). See Table 8 for details.

Recognising that assigning consumers to the various treatments can be open to bias, respondents received whatever treatment was currently showing on the computer monitor. The randomness of interception helped to distribute the various treatments and conditions across the sampled population.

An illustration of how each respondent was assigned a treatment session is shown below; where 'T' represents a full set of experiments and treatment conditions packaged into one complete interview session. The number in italics represents each respondent

at the point of intercept. Respondents kept the same identification number for all experiments and questions.

T1	T2	T3	T4	T5	T6	T7	T8
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
9	*10*	*11*	*12*	*13*	*14*	*15*	*16*
17	*18*	*19*	*20*	*21*	*22*	*to*	*444*

Household income

At intercept there was no way of knowing the household income of the respondent, so it was not possible to balance the membership of the Step or Sim groups until all experiments were finished. As there was no interest in the household incomes per se, the ten household income levels were subdivided into three, approximately equal subgroups; $40,000 and under, $41,000 to $70,000, and $71,000 and over. Table 7 provides the number of respondents at each income level and the membership of each subgroup.

Table 7

Establishment and composition of household income groups

	Household income Options displayed on the monitor	Count	Percent	Household Income Groups (Studywise)
A	$10,000 or less	12	2.7	
B	11,000 to 20,000	47	10.59	$40,000 and under
C	21,000 to 30,000	61	13.74	38.51%
D	31,000 to 40,000	51	11.49	n = 171
E	41,000 to 50,000	48	10.81	$41,000 to $70,000
F	51,000 to 60,000	45	10.14	29.06%
G	61,000 to 70,000	36	8.11	n = 129
H	71,000 to 80,000	29	6.53	$71,000 and over
I	81,000 to 100,000	40	9.01	32.43%
J	$101,000 or more	75	16.89	n = 144
		N = 444		

Respondent age

As the balancing of the membership of Step or Sim groups in terms of age could not be determined by observation alone, respondents were divided into three equal sized age groupings after all experiments were completed. These subgroups were determined as a young 18 to 35 year group, a middle group of 36 to 53 year olds, and a group containing 54 to 84 year olds. Table 8 provides detail. Coincidently, sampling was close to New Zealand's national age distribution (Statistics NZ, 2004), which suggests that respondent selection was both random and representative of age in the general population.

Table 8

Gender and the establishment of age groups

	Age groupings		
	18 – 35 years	**36 to 53 years**	**54 to 87 years**
Female			
Count	87	85	73
Percent	35.5	34.7	29.8
Male			
Count	57	65	77
Percent	28.6	32.7	38.7
Total			
Count N = 444	144	150	150
Percent	32.4	33.8	33.8
New Zealand Distribution Female & Male Approximate %	36	36	28

New Zealand age distribution estimated from Statistics NZ 2004 values

Balancing Step and Sim treatment groups – adjustment weights

Sampling differences between the background factors of gender, age and household income posed analytical difficulties for all four experiments, due to the imbalance between these background factors in both the Step and Sim groups. Without correcting for this imbalance there is potential for these factors to bias results and confound the measurement of experimental effect. One way to correct this imbalance was to adjust results through weightings.

To calculate the adjustment weights, respondents (represented by counts) for each gender, household income level, and age group were separated into their respective Step and Sim subgroups, with each different sample treated separately. This final division created a cell in which all members in that cell shared the same common characteristics. For instance, in the sample used in E1, one cell shows 7 females in the Step cell and 6 in the control or Sim cell, all 13 respondents live in households were the total income was less than $40,000 a year, and are aged between 18 and 35 years. To balance the Sim cell with that of the Step cell, the Sim group results were weighted by .857 (7÷6). As there were three separate samples used in the four experiments, weightings were separately calculated for each sample. Due to space, only Table 9 is shown below, the other tables are in Appendix H and Appendix I.

A demonstration of the importance for making these adjustments is in Table 9, which shows a large imbalance between 35 to 53 year old males that have a household income of $41,000 to $70,000. Here the Sim group has 11 males while the Step group has only three males. To balance requires an adjustment weighting of 3.67. Any future work would benefit by a more rigorous selection of respondents at intercept, and, or their assignment to Step or Sim treatment conditions to reduce reliance on large weightings to adjust the experimental results.

Table 9

Background factors and adjustment weights for experiments 1 and 2

Gender	Household Income	Age	Step group	Sim group	Total	Adjustment Weight
Female	$40,000 and under	Young 18-35 years	7	6	13	0.86
		Middle 35-53 years	9	4	13	0.44
		Older 54-87 years	16	8	24	0.50
		Total	32	18	50	
	$41,000 to $70,000	Young 18-35 years	6	13	19	2.17
		Middle 35-53 years	8	6	14	0.75
		Older 54-87 years	4	4	8	1.00
		Total	18	23	41	
	$71,000 and over	Young 18-35 years	3	9	12	3.00
		Middle 35-53 years	10	10	20	1.00
		Older 54-87 years	8	2	10	0.25
		Total	21	21	42	
Male	$40,000 and under	Young 18-35 years	5	6	11	1.20
		Middle 35-53 years	6	3	9	0.50
		Older 54-87 years	9	15	24	1.67
		Total	20	24	44	
	$41,000 to $70,000	Young 18-35 years	3	5	8	1.67
		Middle 35-53 years	**3**	**11**	**14**	**3.67**
		Older 54-87 years	4	5	9	1.25
		Total	10	21	31	
	$71,000 and over	Young 18-35 years	3	4	7	1.33
		Middle 35-53 years	12	6	18	0.50
		Older 54-87 years	6	5	11	0.83
		Total	21	15	36	
Total			122	122	244	

RESULTS

This section starts by examining the changes in preference share of options after Step treatment, compared to the share of the same options in the untreated or control group (Sim). Following on from this, a second section reports on the effects that gender, household income, and age had on choice. Readers should note preference values are in rounded percentages and are weighted. Chi-square tests determined the independence between the treated and untreated group results.

Section one – choice results

The main objective of all experiments was to test the hypothesis (H_1) that:

> Consumers who make paired comparisons of alternatives that vary in price and quality before selecting from a triple set of the same options (Step group) are more likely to choose the cheapest option, than those who evaluate just the triple set comprised of the same options (Sim group).

H_1 predicts that the share of the lowest priced, lowest quality option in the Step group should be higher than the same option in the Sim group. As the focus is on the lowest price-quality option, the following tables compare the combined total share of both the highest and middle price-quality options (A+B) against the lowest price-quality option C. If there is a higher, but statistically significant difference between the low price-quality option 'C' in the Step group, compared to the same low price-quality option in the Sim group, then this supports H_1.

Experiment 1 - wristwatches

E1 replicates both Simonson, Nowlis, and Lemon's (1993), and Brennan and Laafai's (2003a; 2003b; Laafai, 2002) wristwatch experiments. An examination of the results in Table 10 revels that the share of the lowest price-quality wristwatch option, Casio, is the same for both Step and Sim treatments (51%). It is coincidental that counts equal each other. While not included in the table below, the un-weighted results were also checked in case weightings were distorting results, but there was little difference between the two treatment groups (Step Casio 45%, Sim Casio 51%; $\chi^2 = .805$, df = 1, p = .37). As there was an expectation the Casio share would be higher for the Step treatment group

compared to that of the Sim or control group, this rejects H_1. To summarise, no measurable treatment effect was observed.

Table 10

Experiment 1
Effect of presentation on choice between low-price and higher priced wristwatches

	Stepwise		Simultaneous	
	n	%	n	%
A Seiko + B Citizen	60	49	60	49
C Casio	62	**51**	62	**51**
Total	122	100	122	100

Note: For A+B,C, $\chi^2 = 1$, df = 1, p = 1

A reasonable question to ask is what happened to the shares of the other two options? A breakdown of the Seiko and Citizen results in Table 11 shows that while the Casio share has remains unchanged, the Seiko share increased at the expense of the middle priced Citizen brand. However, this upward share movement to the higher priced watch was small (5%), and not statistically significant (Citizen $\chi^2 = 1.2$, df = 1, p = .277). Overall, this result suggests that the applied treatments compared with the untreated group had little or no effect on any of the options (Step v Sim $\chi^2 = 1.655$, df = 2, $p < .5$).

Table 11

Experiment 1
Effect of presentation on the choice of wristwatches

	Stepwise		Simultaneous	
	n	%	n	%
A Seiko	37	30	30	24.5
B Citizen	23	19	30	24.5
C Casio	62	51	62	51
Total	122	100	122	100

For Seiko, $\chi^2 = 1$, df = 1, p = .315; Citizen, $\chi^2 = 1.2$, df = 1, p = .277; Casio, $\chi^2 = 1$, df = 1, p = 1; Step v Sim $\chi^2 = 1.655$, df = 2, $p < .5$

Of concern in this experiment was how consumers were evaluating the quality of the watches. While not part of this thesis, respondents were asked in a post-choice task to rank the quality of the wristwatches they recently considered in E1, to check if the price-quality relationship was holding. As already outlined in Table 3, it is clear this

relationship was tenuous at best, as it failed to hold for the lowest quality Casio brand which ranked as low quality by 45% of the respondents, and highest in quality by 26% of the respondents tested (n = 244). Citizen on the other hand was ranked by 59% of respondents as the highest quality watch, although it was expected to be of middle quality (39%). In sum, this suggests that respondents were either guessing the quality of the wristwatches, or more plausibly, they were already familiar with the brands in some way.

In a further post-choice task, not intended to be part of this thesis, respondents were asked, without looking - what brand of watch are you wearing now? There was an expectation respondents would know the brand of watch they were wearing. However, results showed that 37% of respondents had no idea of the brand they were wearing; only 30% knew. From these results, it is debatable if brand names are a useful indicator of quality, and if it was not useful how did respondents decide between options; on price only? How brand awareness effects Step choice requires further research.

Experiment 2 – two-slice electric toasters

In the previous experiment, price and brand name helped to differentiate between watches, but in E2, the toasters were displayed with additional features; cord storage, cool-touch sides, or a 12-month guarantee period. Looking at the results in Table 12, the Step share of the low priced Breville toaster (32%) is higher than the same untreated option (Sim, 24%) by eight percent, however, this difference is not statistically significant ($\chi^2 = 2.039$, df = 1, p = .153). While the significance of this result cannot entirely rule out a treatment effect, if it did occur then it was weak at best. The evidence from this experiment rejects H_1.

Table 12

Experiment 2
Effect of presentation on choice between low-price and higher priced toasters

	Stepwise		Simultaneous	
	n	%	n	%
A Sunbeam + B Russell Hobbs	83	68	93	76
C Breville	39	**32**	29	**24**
Total	122	100	122	100

Note: For A+B,C, $\chi^2 = 2.039$, df = 1, p = .153

As with Breville, the applied treatments had no statistically significant effect on the shares of Sunbeam or Russell Hobbs, or the overall difference between the treated (Step) and untreated (Sim) groups as a whole, see Table 13 (Step v Sim $\chi^2 = 2.04$, df = 2, p < .3).

Table 13

Experiment 2
Effect of presentation on the choice of toasters

	Stepwise		Simultaneous	
	n	%	n	%
A Sunbeam	28	23	32	26
B Russell Hobbs	55	45	61	50
C Breville	39	32	29	24
Total	122	100	122	100

For Sunbeam, $\chi^2 = .354$, df = 1, p = .552; Russell Hobbs, $\chi^2 = .805$, df = 1, p = .37; Breville, $\chi^2 = 2.039$, df = 1, p = .153. Step v Sim $\chi^2 = 2.04$, df = 2, p < .3

Of interest during fieldwork, some consumers commented that the Breville brand name appeared 'foreign' to them, while the Sunbeam brand, and in particular Russell Hobbs, were described as 'good brands'. That respondents were familiar about some electric toaster brands and not others, suggests that brand familiarity might be confounding the treatment results. There is additional evidence for this from the results of the post-choice ranking task, which while not part of this thesis showed that Sunbeam, assumed to be the highest quality option, was considered so by only a third (32%) of respondents; 31% thought it was of low quality. On the other hand, 58% of respondents (n = 244) considered Russell Hobbs was the highest quality toaster, although 56% of

consumers agreed Breville was the lowest quality of three brands ranked (see Table 5). These results are concerning and suggest that more research is required, such as controlling the influence of quality in pairwise and final choice by using fictitious brand names, compared with well-known brands.

Experiment 3 - ballpoint pens

While the previous experiments used graphic descriptions to display options, this experiment used actual ballpoint pens. To make the choice task even more realistic, respondents were encouraged to use the pens by writing something as a way of testing each option, just as consumers do in practice. While the method of considering a real product is clearly different from that previously used, the results were the same (see Table 14). There was no difference in the share of the lowest price-quality option Stabilo after application of the Step treatment, compared with Stabilo in the untreated group (Sim). The results were so similar that the treated and untreated groups could just as easily come from the same treatment group. There was no measurable treatment effect ($\chi^2 = .08$, df = 1, p = .779). This evidence clearly rejects H_1.

Table 14

Experiment 3

Effect of presentation on choice between low-price and higher priced ballpoint pens

	Stepwise		Simultaneous	
	n	%	n	%
A Pental + B Pilot	110	77	108	76
C Stabilo	32	**23**	34	**24**
Total	142	100	142	100

Note: For A+B,C, $\chi^2 = .08$, df = 1, p = .779

As for the results of the other options, there was a small upward movement of share (4.5%) from the middle price-quality option (Pilot) to the higher price-quality Pental pen. However, this difference was not statistically significant ($\chi^2 = .629$, df = 1, p = .428). When the treated (Step) and untreated (Sim) groups are compared as a whole, there was no statistically significant difference between the groups, $\chi^2 = 2.04$, df = 2, p < .3. For individual pen results, see Table 15.

Table 15

Experiment 3
Effect of presentation on the choice of ballpoint pens

	Stepwise		Simultaneous	
	n	%	n	%
A Pental	78	55	70	49
B Pilot	32	22.5	38	27
C Stabilo	32	22.5	34	24
Total	142	100	142	100

For Pental $\chi^2 = .903$, df = 1, p = .342; Pilot $\chi^2 = .629$, df = 1, p = .428; Stabilo $\chi^2 = .079$, df = 1, p = .779. Step v Sim $\chi^2 = 3.426$, df = 2, p < .2

Results across product categories

While the results reported above show each product type separately, Simonson, Nowlis, and Lemon (1993) report their experimental results across product categories. Such a test is a more stringent than one that only examines choice within a product category. By pooling the results of E1 to E3, this allows the inclusion of some 1900 separate decisions, made across three different product categories and nine different brands.

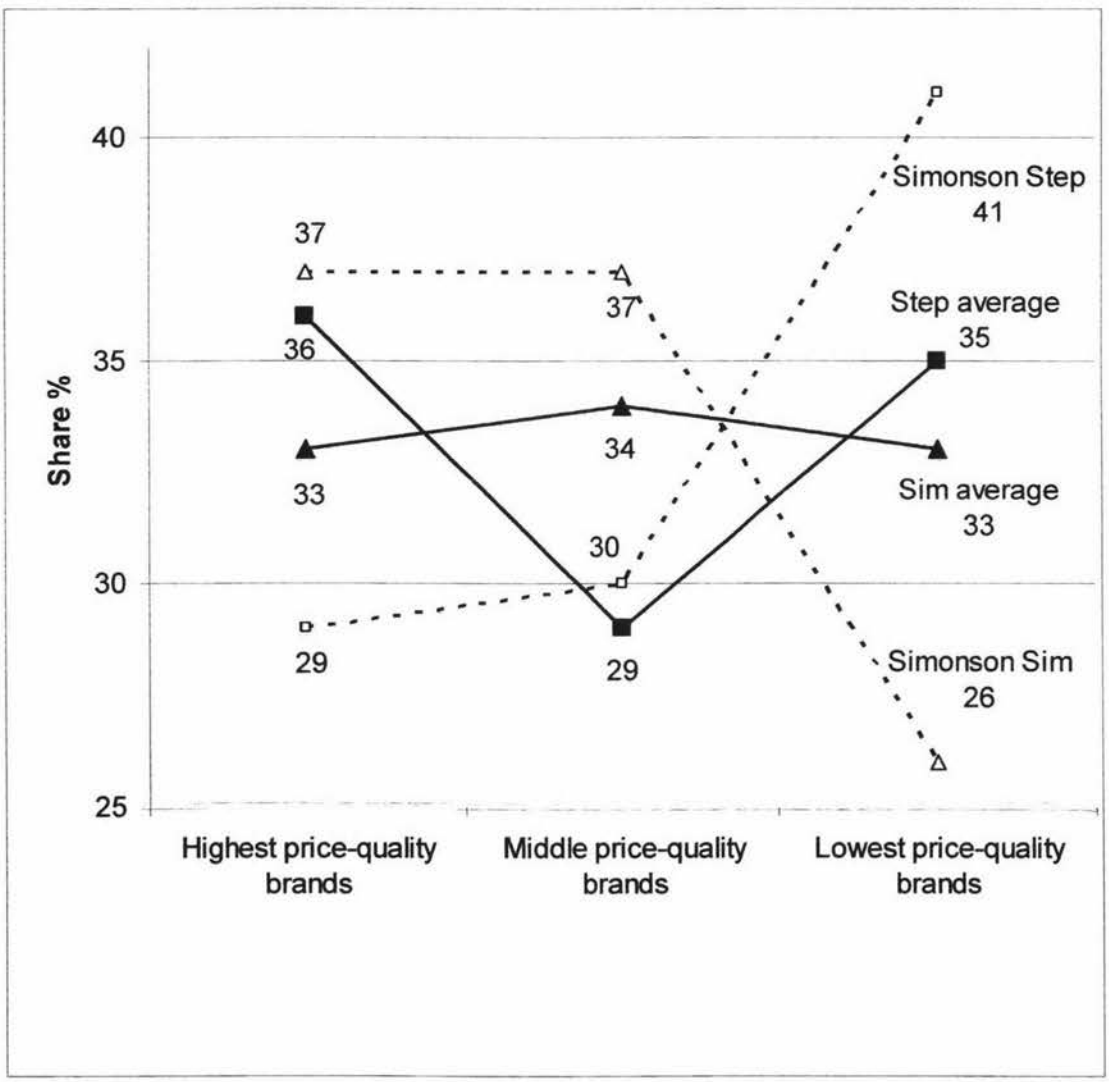
To help compare Simonson et al. findings with those in the present study, as well as acting as a further test on H_1, all the results of the current study were pooled and reported in terms of high, medium, and low price-quality. Results from averaging the Step and Sim results (E1 to E3) were compared with those of Simonson et al. (1993) and shown graphically in Figure 9.

Looking at the graph in Figure 9, the share of the lowest price-quality brands is higher under Step treatments than for the control or Sim groups. However, this difference is only two percent and not enough to support H_1. This trivial difference contrasts with Simonson et al. results, which show a 15% gap between their Step and Sim treatments. Additionally, the spread of results at each price-quality level appears to vary more in Simonson et al. study than in this study. One possible reason for this variance might be due to the weightings used in the current study, as opposed to Simonson et al. who did not account for heterogeneity in their samples; they only attempted to balance males and females during sampling. Another reason might be due to the different product

categories used by Simonson et al., compact disc players, watches, and credit cards; as compared to those used in this study. It is possible that the treatment effect Simonson et al. refer to, is product specific and not a general effect. However, the individual product results in this study do not seem to support the product specific suggestion, as none of the experiments in the current study showed statistically significant treatment effects. Any future study should investigate the effects of Step treatments on more expensive products and financial packages.

Figure 9

Effect of presentation across product categories
Comparison between the current and Simonson et al. (1993) studies'



Experiment 4 - wristwatches

Middle-option-first experiment. Using an entirely different sample, respondents were asked to select between the same three wristwatch brands used in E1, however, this time these options were rearranged so they presented the middle option first in the first paired choice set. That is, watches were displayed as either {Citizen $159; Casio $129} or {Citizen $159; Seiko $189}. This presentation order differs to that used in the first experiment (E1), which presented the first pairing as either {Seiko $189; Casio $129} or {Casio $129; Seiko $189}. For how the other pairings and triple choice sets in E1 and E4 were arranged see Appendix C.

As the options used in both experiments were the same and only the order of presentation was altered in E4, there was an expectation that the predictions of H_1 should also hold for E4. That is, the share of the lowest price-quality Casio option should be higher after a Step treatment compared to the Sim group. If results differ significantly between the two experiments, then this is evidence that the arrangement of the antecedent pairings is as important as the expected effects gained from applying a Step treatment.

The results in Table 16 show a clear distinction between the shares of the lowest priced Casio watch in the Step treatment group (34%), compared to the same brand in the Sim group (50%). The difference between these two groups is 16 percent, and statistically significant, $\chi^2 = 5.3$, df = 1, p = .02. Remembering that reported results are weighted, a check was made on this result by examining the unweighted results in case weightings were distorting results. However, as expected, the Casio results were still statistically significant; Step 40%, Sim 60%, a difference of 20%; $\chi^2 = 5.95$, df = 1, p = .015.

Of more concern was the direction of the weighted result, for this was counter to that predicted by H_1. The share of the lowest price-quality Casio watch decreased after exposure to the Step treatment, when it should have increased. While this result unequivocally rejects H_1, it does not explain why such a reversal occurred. One possibility is that by presenting the first pairing in the middle-option-first format, this may have influenced or framed the subsequent choice sets differently than in first experiment. For example, the difference in exchange between the middle-option-first is

smaller, $30, than for the full-range-first presentation with its $60 difference. These results require further testing and explanation.

Table 16

Experiment 4
Middle option presented first
Effect of presentation on choice between low-price and higher priced wristwatches

	Stepwise		Simultaneous	
	n	%	n	%
A Seiko + B Citizen	66	66	50	50
C Casio	34	**34**	50	**50**
Total	100	100	100	100

Note: For A+B,C, $\chi^2 = 5.255$, df = 1, p =.022

Looking at the changes for the other brands (see Table 17), the distribution of shares in the Step group appears more even, while the shares in the Sim group less so. While the middle price-quality option (Citizen) share remains unchanged, the application of the Step treatment has moved the preference from the lowest price-quality Casio watch to the highest price-quality Seiko brand; this violates the prediction of H_1. Furthermore, this change in share was statistically significant, Seiko $\chi^2 = 5.5$, df = 1, p = .019; Casio $\chi^2 = 5.3$, df = 1, p = .002. Accepting that the counts in this experiment are low (n = 100), this is an important finding from this experiment.

Table 17

Experiment 4
Middle option presented first
Effect of presentation on the choice of wristwatches

	Stepwise		Simultaneous	
	n	%	n	%
A Seiko	36	**36**	21	**21**
B Citizen	30	30	29	29
C Casio	34	**34**	50	**50**
Total	100	100	100	100

Note: For Seiko, $\chi^2 = 5.521$, df = 1, p = .019; Citizen, $\chi^2 = .04$, df = 1, p = .841; Casio, $\chi^2 = 5.255$, df = 1, p = .002

Results across studies - wristwatches

While it is sensible to report results of experiments separately, it is often helpful to compare similar experiments directly against each other, particularly in regards to the different results between E1 and E4. In line with this, the graph in Figure 10 shows the difference between displaying options in a full-range-first format, as used in E1, as opposed to displaying the same options in a middle-option-first presentation (E4). The decision to use a graphical presentation instead of statistical comparisons was due to the different weightings and sample sizes between E1 (N = 244) and E4 (N = 200). While the calculation of a new weighting schedule would allow statistical comparisons, this was considered unnecessary.

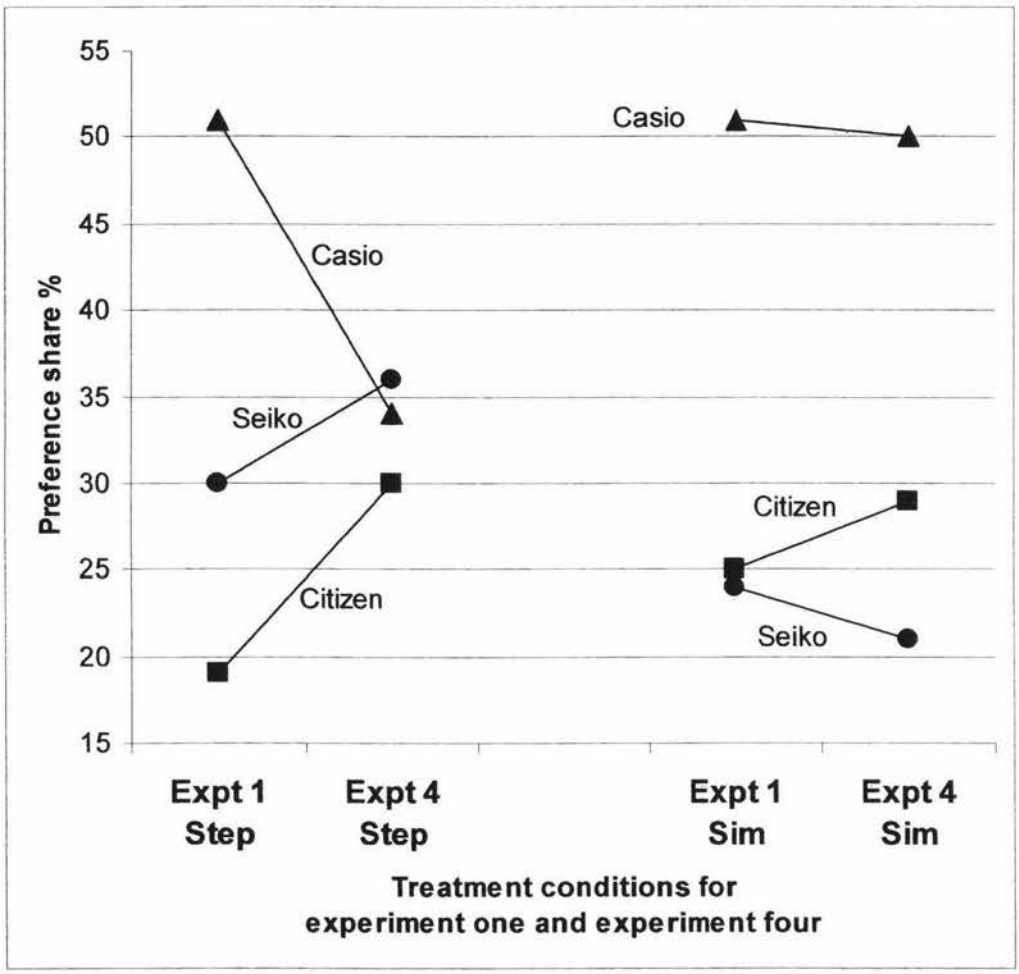
The graph in Figure 10 shows Step and Sim results separately. First the Sim results; what is noticeable is the Sim results are similar between experiments. This confirms the original belief that ordering of options within triple sets has less effect on choice than ordering in the pairings. As the triple results show, the Casio share hardly differed (1%) between E1 and E4, although the Seiko and Citizen brands diverge slightly (Seiko 3%; Citizen 4%). This similarity between Sim results was reassuring as Sim acted as control in both studies.

Now the Step results; these results are clearly different between both experiments. Of interest, the Casio Step share in E1 is similar to Casio Sim share in both E1 and E4, but more importantly the E1 Casio Step share drops by 17% when presented in the middle-option-first format (E4). The size of this change is concerning and difficult to explain, except the E4 Step results appear to average out, with Step Seiko 36%, Step Citizen 30%, and Step Casio 34%. Such a result tends to suggest that respondents might be guessing between options, although it is unclear if they are doing this.

As for the other wristwatch options, the difference in share between both experiments shows the Citizen brand differed more percentage wise than Seiko; Seiko 6%, Citizen by 11%.

Figure 10

Wristwatch results compared across both experiments
Experiment one and experiment four



Section two - background effects

This section reports on three background factors as they affected H_1, H_2, H_3, and H_4. The main thrust of the current study was to compare results from stepwise (Step) treatments against the shares of the same options from the untreated or control group (Sim). The hypotheses under test is based on the expectation that shares of the lowest price-quality option will be higher in the treated group than for the same option in the untreated group, and that this result was not due to the background effects of gender, household income, or age on choice. To test for these background effects required they be controlled, while comparing the share of the lowest price-quality options against all other options; that is, A + B, C. As previously, chi-square tests helped determine the statistical significance of the results. As there are a large number of tables required to report results, only the tables were background factors have interacted with the Step treatments and show statistically significant results are in the text. The other results are in the appendices section; gender, Appendix J; household income level, Appendix K; age group, Appendix L.

A full summary of the results from the tests used on the hypotheses is in Table 24.

Influence of gender on choice

Experiment four. While there was no difference between the choices made by females compared with males in the full-range-first experiments (E1 to E3), the middle-option-first presentations in E4 showed that males responded to the Step treatment more than females. Looking at Table 18, after receiving the Step treatment the Casio share dropped by 24% compared with the untreated or Sim share; Casio male Step 24%, Casio male Sim 48%. This difference of 24% is statistically significant, $\chi^2 = 5.185$, df = 1, p = .023, but opposite to that implied by H_2.

While not shown in Table 18, due to space, the highest price-quality Seiko brand benefited the most from the effects of the Step treatment; Seiko male Step 52%, Sim male 33%, these results were statistically significant, $\chi^2 = 3.11$, df = 1, p = .078. The female Seiko results were not significant, Step 22%, Sim 12% ($\chi^2 = 2.18$, df = 1, p = .14). Why females did not respond in a same manner as males is open to speculation.

For instance, females might consider watches as a fashion accessory, while men may only require a watch that lasts and works.

Table 18

Experiment 4
Effect of gender on the choice of low-priced wristwatches

	Female				Male			
	Stepwise		Simultaneous		Stepwise		Simultaneous	
	n	%	n	%	n	%	n	%
A Seiko + B Citizen	34	59	28	48	32	**76**	22	**52**
C Casio	24	41	30	52	10	**24**	20	**48**
Total	58	100	58	100	42	100	42	100

Note: For females, A+B,C, $\chi^2 = 1.247$, df = 1, p = .264; males, A+B,C, $\chi^2 = 5.185$, df = 1, p = .023

Influence of household income on choice

Experiment three. As shown in Table 19, Stabilo's share from consumers in the $41,000 to $70,000 household income bracket increased 16% after applying the Step treatment, this is a significant but albeit a marginal result, $\chi^2 = 2.68$, df = 1, p = .102. As this result is weak and there is no other confirming support from the other household income level groups, this is sufficient evidence to reject H_3.

Table 19

Experiment 3
Effect of household income on the choice of ballpoint pens

	Stepwise						Simultaneous					
	$40,000 and under		$41,000 to $70,000		$71,000 and over		$40,000 and under		$41,000 to $70,000		$71,000 and over	
	n	%	n	%	n	%	n	%	n	%	n	%
A Pental + B Pilot	37	77	24	**62**	35	78	34	71	38	**78**	36	80
C Stabilo	11	23	15	**38**	10	22	14	29	11	**22**	9	20
Total	48	100	39	100	45	100	48	100	49	100	45	100

Note: For $40k and under, A+B,C $\chi^2 = .487$, df = 1, p = .485; $41k to $70k A+B,C $\chi^2 = 2.675$, df = 1, p = .102; $71k and over, A+B,C $\chi^2 = .067$, df = 1, p = .796

Experiment four. After the highest household income group ($71,000 and over) received the Step treatment, the low priced Casio brand lost 25% of its share; Step Casio 33%, Sim Casio 58%, see Table 20. This loss is statistically significant, $\chi^2 = 3.9$, df = 1, p = .048. As the Casio Step share is lower than the Sim result and contra to that expected, this evidence rejects the household income hypothesis (H_3).

While not specifically shown in Table 20, the Seiko and Citizen results are combined, in the $71,000 and over household income group, the highest priced-quality Seiko brand received the greatest increase, with its Step share doubling (Step 42%, Sim 21%). This was a statistically significant result, $\chi^2 = 3.42$, df = 1, p = .064. The middle household income group ($41,000 to $70,000) also favoured Seiko over Casio, with a 21% increase after treatment, this was also a significant result ($\chi^2 = 5.65$, df = 1, p = .017).

Table 20

Experiment 4
Effect of household income on the choice of wristwatches

	Stepwise						Simultaneous					
	$40,000 and under		$41,000 to $70,000		$71,000 and over		$40,000 and under		$41,000 to $70,000		$71,000 and over	
	n	%	n	%	n	%	n	%	n	%	n	%
A Seiko + B Citizen	29	71	16	62	22	**67**	24	59	12	46	14	**42**
C Casio	12	29	10	38	11	**33**	17	41	14	54	19	**58**
Total	41	100	26	100	33	100	41	100	26	100	33	100

Note: For $40k and under, A+B,C $\chi^2 = 1.334$, df = 1, p = .248; $41k to $70k A+B,C $\chi^2 = 1.238$, df = 1, p = .266; $71k and over, A+B,C, $\chi^2 = 3.911$, df = 1, p = .048

Influence of respondent age on choice

The influence of age on choice has some effect on the Step choice of electric toasters (E2), ballpoint pens (E3), and watches in E4, but not in E1; details follow.

Experiment two. Table 21 shows the youngest age group (18 to 35 years) has responded to the Step treatment, as evidenced by the increase in share of the Breville

toaster brand by 32%; Breville Step 44%, Sim 12%. The gain in share was not only statistically significant, but in the direction expected by H_4; $\chi^2 = 11.33$, df = 1, p = .001. This result provides strong support for H_4.

However, this result may not be due to the Step treatment alone, for as pointed out earlier, some respondents appeared more familiar with some brand names than others did. In the same vein, some respondents might consider Breville higher in quality than is suggested by its price, for in the post-choice quality-ranking task, 44% of respondents considered Breville to be of middle or high in quality, see Table 5.

If Breville gained in preference within the youngest age group, which toaster brands surrendered share? While not specifically shown in Table 21, both Sunbeam and Russell Hobbs lost share equally (16%). Sunbeam's loss was statistically significant, $\chi^2 = 2.9$, df = 1, p = .088, but the loss by Russell Hobbs was not significant ($\chi^2 = 2.23$, df = 1, p = .129). As for the other age groups in the toaster experiment, none showed statistically significant differences between the treated and untreated groups.

Table 21

Experiment 2
Effect of age on the choice of electric toasters

	Stepwise						Simultaneous					
	Young 18 to 35 years		Middle 36 to 53 years		Older 54 to 87 years		Young 18 to 35 years		Middle 36 to 53 years		Older 54 to 87 years	
	n	%	n	%	n	%	n	%	n	%	n	%
A Sunbeam + B Russell Hobbs	24	**56**	29	73	30	77	38	**88**	24	60	31	80
C Breville	19	**44**	11	27	9	23	5	**12**	16	40	8	20
Total	43	100	40	100	39	100	43	100	40	100	39	100

Note: For young, A+B,C $\chi^2 = 11.328$, df = 1, p = .001; middle, A+B,C $\chi^2 = 1.398$, df = 1, p = .237; older, A+B,C $\chi^2 = .075$, df = 1, p = .784.

Experiment three. The effects of age on choice also extended to ballpoint pens. The results in Table 22 show that the middle age group (36 to 53 years) was effected by the Step treatment, as the share of Stabilo improved by 14%, although this gain was only marginally significant, $\chi^2 = 2.65$, df = 1, p = .104. Due to the weakness of this result and the lack of support from the other age group results, it was decided to reject H_4.

Table 22

Experiment 3
Effect of age on the choice of ballpoint pens

	Stepwise						Simultaneous					
	Young 18 to 35 years		Middle 36 to 53 years		Older 54 to 87 years		Young 18 to 35 years		Middle 36 to 53 years		Older 54 to 87 years	
	n	%	n	%	n	%	n	%	n	%	n	%
A Pental + B Pilot	42	84	32	**67**	35	80	37	74	39	**81**	32	72.7
C Stabilo	8	16	16	**33**	9	20	13	26	9	**19**	12	27.3
Total	50	100	48	100	44	100	50	100	48	100	44	100

Note: For young, A+B,C, $\chi^2 = 1.507$, df = 1, p = .22; middle, A+B,C, $\chi^2 = 2.65$, df = 1, p = .104; older, A+B,C, $\chi^2 = .923$, df = 1, p = .337

Experiment four. Table 23 shows that the share of Casio for the youngest age group has reduced by 29% following the Step treatment, a statistically significant loss, $\chi^2 = 6.92$, df = 1, p = .009, but not in the direction expected by the age hypothesis; this rejects H_4.

Referring again to the results of the youngest age group of consumers, the share lost by Casio (29%) has moved to the higher price-quality Seiko and Citizen brands, with Seiko gaining 19% and Citizen 10%. While these results are not shown in detail, due to space, the Seiko gain was statistically significant, $\chi^2 = 4.53$, df = 1, p = .033, but the Citizen share was not significant, $\chi^2 = 1.05$, df = 1, p = .306. As for the other age groups, there were no significant change in shares except for the middle age group's share of Seiko, which increased by 21% after the Step treatment; this was a statistically significant increase, $\chi^2 = 4.38$, df = 1, p = .036.

Table 23

Experiment 4
Effect of age on the choice of wristwatches

	Stepwise						Simultaneous					
	Young 18 to 35 years		Middle 36 to 53 years		Older 54 to 87 years		Young 18 to 35 years		Middle 36 to 53 years		Older 54 to 87 years	
	n	%	n	%	n	%	n	%	n	%	n	%
A Seiko + B Citizen	25	**60**	17	61	24	80	13	**31**	13	46	24	80
C Casio	17	**40**	11	39	6	20	29	**69**	15	54	6	20
Total	42	100	28	100	30	100	42	100	28	100	30	100

Note: For young, A+B,C, $\chi^2 = 6.92$, df = 1, p = .009; middle, A+B,C, $\chi^2 = 1.149$, df = 1, p = .284; older, A+B,C $\chi^2 = 0$, df = 1, p = 1

Table 24

Summary of experimental tests on hypotheses

Experimental results	Hypothesis 1	Hypothesis 2 Effect of gender		Hypothesis 3 Effect of household income			Hypothesis 4 Effect of age		
		Female	**Male**	**$40,000 and under**	**$41,000 to $70,000**	**$71,000 and over**	**Young 18 to 35 years**	**Middle 36 to 53 years**	**Older 54 to 87 years**
Experiment 1									
Wristwatches Full-range-first	-	-	-	-	-	-	-	-	-
Experiment 2									
Electric toasters Full-range-first	-	-	-	-	-	-	**Confirmed** *Significant effect*	-	-
Experiment 3									
Ballpoint pens Full-range-first	-	-	-	-	**Rejected** *Marginal effect*	-	-	**Rejected** *Marginal effect*	-
Experiment 4									
Wristwatches Middle-option-first	**Rejected** *Significant reversal*	-	**Rejected** *Significant reversal*	-	-	**Rejected** *Significant reversal*	**Rejected** *Significant reversal*	-	-

Note: A dash (-) shows the hypothesis has been rejected.

DISCUSSION

Four experiments tested the claim by Simonson, Nowlis, and Lemon (1993) that, consumers who make paired comparisons of alternatives that vary in price and quality before selecting from a triple set of the same options (Step treatment), are more likely to choose the cheapest option than those who evaluate just the triple set comprised of the same options (H_1). Overall, none of the results from the four experiments supported their claim. A similar conclusion was reached by Brennan and Laafai (Brennan & Laafai, 2003a; 2003b; Laafai, 2002).

In addition to the replication experiments undertaken in this study, the influence of background factors on choice were also tested, for there was a possibility that choices made pairwise before making a final decision might differ between males and females, or between different household incomes and age. One way to test for these background effects was to control for each background factor separately. The result of these tests showed that there were only three interactions of statistical significance between household income level, and the age group of the respondents. Two of these results were marginally significant and involved the selection of real ballpoint pens, where the effect household income level ($41,000 to $70,000) and age group (36 to 53 years) interacted with the Step treatment in the manner indicated by H_1. However, these were singular results and lacked any significant support from the other household income or age groups tested. Overall, it was felt that these two results were inconsistent across the experiments, and coupled with the marginal level of significance the results failed to support the household income H_3, and age H_4, hypotheses.

On the other hand, there was strong statistical support for H_4 from the youngest group of consumers (18 to 35 years) when selecting between electric toaster brands. While the other age groups failed to give statistically significant support to H_4, it was felt that the results from the youngest group confirmed a treatment effect could have taken place. This single positive result is curious, and suggests that some other confounding factor was involved in the toaster experiment (E2). One possible factor that might have effected results is brand familiarity. Familiarity with the test product would suggest that the respondents bring to the choice occasion additional information that overpowers the treatment effect under test and confounds interpretation of the results. An example of

such brand familiarity, or prior learning, was confirmed during fieldwork, where some respondents commented that the 'Breville' brand name sounded 'foreign' to them, while Russell Hobbs and Sunbeam are 'good brands'. It is suggested it is a short step from comments such as these to the chance that the test products had been noticed previously (Goodhardt et al., 1984; McPhee, 1963; and Simonson et al., 1993, p.357.). In other words, an option that already has the largest market share, potentially, starts with a larger informational advantage than the other options within the same choice set. In sum, not all considered options start as equals in a choice set, so this informational bias may confound the effects of local context on choice (Rao & Monroe, 1988; Simonson et al., 1988).

Such an informational bias may also extend to quality. While not designed to be part of this thesis, the effect of prior knowledge on choice comes from a post-choice task that asked consumers to rank the quality of the products (watches and toasters) they had only just considered. The original purpose of this ranking task was to check that the price-quality association was holding; but it clearly did not, as the quality rankings gave mixed results. For example, the Sunbeam brand of toaster was assumed to represent the highest quality option, but when ranked on quality alone only a third of consumers thought that Sunbeam's quality was high, this means that two thirds did not consider it high in quality. Of more concern was the ranking for the lowest price-quality option Breville, for only half (56%) ranked it the cheapest poorest quality toaster. Wristwatch brands faired little better, for the lowest price-quality brand Casio had mixed rankings as half of the respondents considered this option low in quality. That all post-choice rankings are different to that expected, asks the question, what measures did respondents use during their choice making? The effect of quality itself on pairwise choice before final choice requires further research.

As an additional and more stringent test on Simonson et al. claim, the results of all the Step treatments across the product categories was tested. Simonson et al. used evidence from such an aggregation to support their claim. When all the results from the current research were aggregated, there is little difference (2%) between the stepwise treatments (Step) and the untreated results of the lowest priced-quality options. On the other hand, Simonson et al. results show a 15% difference between treated and untreated groups. Further, in Simonson et al. results, the shares of the other higher priced-quality options

varied more than in the current study. One possibility for this variance is due to the weightings used in the current study to help balance the background factors of gender, household income level, and age group between the Step and Sim groups. Simonson et al. did not do this. Without such weightings there is uncertainty if a treatment effect occurred, or that the experimental results are due to heterogeneity within the tested sample. The problems of not making an allowance for heterogeneity calls into question the sampling plan used by Simonson et al. (1993). It seems reasonable to suggest if a sample comes from a student population, then results are going to be different to those from sampling members of the public.

To summarise, the claim by Simonson et al. (1993) that the application of a Step treatment favours the choice of the lowest priced-quality option over that of higher priced-quality options (H_1) is rejected on grounds of insufficient experimental evidence.

Contrary to Simonson et al. (1993) claim, experiment four offered evidence that, the application of a Step treatment not only reduces the preference for the lowest priced-quality option, but instead a Step treatment increases the share of higher priced-quality options. The evidence for this counter claim is both experimental and theoretical.

The methodology used in E4 was the same as that in E1, with the exception the same options were presented in a different manner than that used to replicate Simonson et al (1993) study (E1). In E1 the options in the local choice sets were presented to respondents in a full-range-first format, which was designed to expose the choice maker to the full range of the attributes when they compared the first lowest or highest price-quality option with the highest or lowest price-quality option at the initial pairing, {A, C} or {C, A}. In E4 the initial pairing was changed so the middle option first was displayed, {B, C} or {B, A}. As the options used in both experiments were the same, there was an expectation that the predictions of H_1 should also hold. However, if results differed significantly between those in E1 and those in E4, then this could be taken as evidence that the arrangement of the antecedent pairings is as important as the effects gained from applying a Step treatment.

At the experimental design stage there was an expectation that the middle option would lose share to the low price-quality option, as predicted by Simonson et al. claim. That

the results were opposite to that predicted was a surprise, for not only were they statistically significant, this reversal extended across gender, household income, and age groups. Males appeared to be effected by the Step treatment more than females, as were high household income respondents and those aged between 18 and 35 years. In all of these results, instead of the low priced-quality Casio option gaining in share, it lost most of its share to the high priced, high quality Seiko watch. In practice, if a retailer (watchmaker) wishes to promote cheap watches, then it is better to present all options simultaneously to men, but if they are promoting expensive watches, a stepped middle-option-first approach might be more successful. This promotional strategy conflicts with Simonson et al. (1993) suggestion. However, the findings of Brennan and Laafai (Brennan & Laafai, 2003b; Laafai, 2002), who also used wristwatches to replicate Simonson et al. work, came to the same conclusion as in this study; Step treatments influence consumers to purchase expensive watches rather than cheaper wristwatches.

As the results of E4 are contrary to that expected from Simonson et al. claim, it is reasonable to ask, what reasons are there for such a difference? One important premise in Simonson, Nowlis, and Lemon's (1993) study was that the same set of considered alternatives can lead to systematically different choices, depending on the manner in which those alternatives are evaluated. They propose that the consideration of options in local sets (pairings) will influence local preferences, which in turn determines global choice. This suggests that the first local set or pairing is likely to be more influential on final choice than the local sets that follow. In Simonson et al. study it seems the first paired comparison acts to frame subsequent choice. One possible decisional frame suggests that when respondents are making a choice between two options, they code the options as either expensive, {C, A}, or cheap {A, C} (Kahneman & Tversky, 1979; Tversky, 1977). However, in the middle-option-first study this framing is less noticeable, {B, A} or {B, C}. While this difference in framing might help explain the strength of the responses, although it is uncertain that it does, it fails to explain why the results between the two studies reversed.

One possible explanation for this reversal rests with the effect that a middle or average-on-all-attributes option has on other options in the triple choice set when it is added to an existing pair of options that dominate, or are dominated by that added option. Under such conditions the middle option will attract more preference share from the lower

price-quality option than from the higher price-quality option (Blattberg & Wisniewski, 1989; Huber et al., 1982). However, Ratneshwar, Shocker, and Stewart (1987) contend that such an effect diminishes when consumers are familiar with the options. This suggests that latent background effects can overwhelm local contrast effects. In the post-choice ranking task there was evidence of such familiarity, as shown by the variation in the quality rankings of watches and toasters. With such a variation, it is uncertain which option occupied the lowest and highest price-quality positions.

Simonson and Tversky (1992) propose that when a triple option set is considered, there is a tradeoff between options which can best be described in terms of extremeness aversion, and, or, tradeoff contrast. They also mention that tradeoffs are not possible between pairs, as the rejection of one option means the acceptance of the other – there is nothing to tradeoff. However, this author takes a contrary view to this by suggesting such tradeoffs are possible within paired choice sets, when the same options are considered serially. This counter viewpoint is based on Simonson et al. own notion that choice from local sets influences local preferences, which in turn effects global choice. In Simonson et al. and the current study, the stepwise choice treatment involves consumers in three separate paired choice events, where at each event they chose one option from the pair of options on display, this finally ends in the selection of one option from a triple set of the same options. Experimentally, each decision is a separate choice event, as consumers are unaware of what options, if any, are to follow next (Simonson et al., 1988). The suggestion is, under serial-choice conditions, there is an antecedent effect or a carrying over of preference from a previous consideration on to the next choice event, and so on. For this reason, it is likely the second pairing also includes information from the earlier choice, as well as new information from the local set of options on display (Rao & Monroe, 1988). Additional support for the suggestion that serially considered pairings can be involved in tradeoffs comes from Huber, Payne, and Puto (1982). Huber et al. discard the notion that alternatives, once rejected, can have no further bearing on future choice during the same choice occasion. Such a view violates the concept of independence of irrelevant alternatives, that states that rejected alternatives add no extra information on which to base new choice. If it is accepted that rejected alternatives can influence new choice, this means asymmetric effects are possible within pairings, for when an inferior option is added to an existing pair of options in the same choice set, this inclusion can increase the share of a superior option

relative to its previous share (Huber et al., 1982). As for tradeoffs within the final triple set, it is widely accepted, theoretically, that tradeoffs within triples still involves paired comparisons ({A, B}, {C, B}, and {A, C}).

Accepting that tradeoffs are possible in both serially considered pairs and within triple choice sets, then the concepts of tradeoff contrast and extremeness aversion propounded by Tversky and Simonson (1992) may apply to the current study. One condition, which Simonson and Tversky say describes the effect of context on choice, is polarisation. Polarisation occurs when one extreme option, in this study 'A' or 'C', dominates or is dominated by the middle price-quality option 'C', in terms of price, and, or quality. When such a condition occurs, as described by Simonson and Tversky (see literature review for a full explanation), this results in higher priced, higher quality brands taking more share from lower priced brands than the reverse. However, while polarisation might help explain the results in E4, a second condition that Tversky and Simonson call compromise might better account for the results in E1. The compromise effect suggests that the middle option, Citizen, can gain share at the expense of both higher and lower priced-quality options when there is indecision between selecting between options 'A' or 'C'. The choice of 'B' is a compromise decision.

An alternative explanation, not one involving loss aversion or the reference-dependant model, suggests that preference share results reflect the current market share of the test products (Goodhardt et al., 1984; McPhee, 1963). However, Simonson, Nowlis, and Lemon (1993) think otherwise, for they contend that a brands share in a consideration set may often be a highly inaccurate predictor of its share of final choice. This author thinks otherwise, for in a local choice set it is likely that one option has a higher market share than other options, which means this option is more familiar to consumers than options with lower market shares. For this reason, a better known option has a higher chance of selection than a less well known option, as the more familiar option, potentially, has a greater informational advantage over less familiar options. In other words, in a paired or triple choice set not all options start as equals. The results obtained in this study, and that of Simonson et al., simply reflect the market share of the respondents sampled.

CONCLUSION

The results from the four experiments do not support Simonson, Nowlis, and Lemon's (1993) claim that, consumers who make paired comparisons of alternatives that vary in price and quality before selecting from a triple set of the same options are more likely to choose the cheapest option, than those who evaluate just the triple set comprised of the same options. Results show that after the application of a Step treatment there was a shift in preference share from the low price, low quality option to a higher priced, higher quality options. This contradicts the predictions of H_1. These results also confirm the findings of Brennan and Laafai (Brennan & Laafai, 2003b; Laafai, 2002), and are in accordance with the corpus of opinion in the literature that suggests, when a consumer has an opportunity to select a higher quality option rather than selecting a lower quality option, they will do so. The evidence is clear, the experimental results that support Simonson et al. (1993) claim are likely an aberration, possibly due to their failure in not accounting for heterogeneity when sampling respondents.

In an extension to Simonson et al (1993) study, the choice options were presented as a middle-option-first display. After treatment, the preference for the lowest priced, lowest quality option reduced while the share of the highest priced, highest quality option increased. This result is contrary to Simonson et al. claim and H_1.

After accounting for heterogeneity, the effects of gender, household income, and age on Step choice were tested. Results showed no measurable effect of gender on the choice, as predicted by H_2, although when options were presented as a middle-option-first display, males were more susceptible to Step treatments than females. However, share results were opposite to that predicted by H_2.

While there was evidence that showed household income was effected by Step treatments, the results were only marginally significant and could not confirm H_3. However, the middle-option-first sequence did show a significant treatment effect with respondents living in households with high incomes. This result was similar to that found by Brennan and Laafai, who also noticed a weak income effect in their replication of Simonson et al. experiments.

The effect of age during Step choice confirmed H_3, although there was only one statistically significant result involving the youngest age group during the selection of electric toasters. The middle-option-first presentation also gave significant results, but these were in the opposite direction of that predicted by H_3.

In sum, while experimental results differ according to gender, household income, and age, the evidence is not sufficient to support Simonson et al. claim. When options were presented in a different sequence than that used by Simonson et al. and Brennan and Laafai, the effects of gender, household income, and age were effected by Step treatments, but while the results were statistically significant they were opposite to that predicted by Simonson et al. (1993).

Future research

Further research is needed to explore the unexpected reversal of Simonson et al. (1993) claim, and to answer why the middle-option-first presentation gave such different results than the full-range-first presentations.

While not intended to be part of the current study, it is clear from the post-choice quality-ranking task that the quality descriptions used to describe options has the potential to confound treatment effects. There are several unanswered questions arising from the current research. For instance, what part did quality play, if any, during paired choice compared with choices made at the global level? If a respondent has never heard about one or more of the brands, how do they evaluate quality? Does a choice made at the first pairing go on to influence final choice, or is it eroded on the way, and if so why and when? Does market share influence paired choice then global choice?

The current study used test products that were common and inexpensive, but Simonson et al. used more expensive products and financial packages. Future research should not only include non-physical products, but both high and low priced options.

Another area for future research is the effect on Stepped choice when pairings and triple option choice sets are displayed in other formats or sequences. As there is the

possibility of forming six different triple choice sets and 48 unique three-paired sets, there is plenty of scope to test how some of these combinations might effect final choice.

While all the options in the choice sets in the current study were displayed an equal number of times before final choice, what happens when options are displayed an unequal number of times, so one or more options receives greater exposure than other options? For example, having subjects consider only two sets of pairings instead of three, before they consider the triple set. Such an arrangement may help answer the question; do all options in the Step choice sets start as equals, and if not, how does this effect preference share?

Study limitations

This study has three important limitations. First, the sample sizes were lower than desirable over the entire study, particularly for E4 where reduced cell size prevented precise measurement of the effect of household income and age on choice.

Second, this study differed from previous studies, as options were displayed on a computer monitor rather than using pencil and paper methods or show cards. It is unknown if choice sets presented electronically differ from those presented on show cards, although both methods have produced similar results.

Third, while the experimental design formalised the rotation of respondents to treatment groups, no attempt was made to change the order of the experiments. This lack of rotation between experiments has the potential to bias results, as there is the possibility previous experiments can effect those that follow.

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APPENDICES

Appendix A

General information sheet made available to members of the public

28 April 2005

GENERAL INFORMATION SHEET

I am conducting research into how people make product choices as part fulfilment of a Masters of Business Science degree at Massey University.

The reason for this research is that 'choice' between options is a common task faced by consumers' as they decide between similar products. There is a belief, under certain conditions, that the manner by which the same options are displayed can have a systematic effect on final choice. In other words, the context of considered alternatives may play a part in deciding between those options.

The experiments involve face-to-face interviews with 400 consumers where they are asked to make a series of choices between pairings and triple sets of common products. Following on from this, the interviewer will then ask the consumer five background questions. Each interview session should take between six and 10 minutes, the period varying between consumers and the series of questions asked. The products involved in the experiments are wristwatches, toasters, desserts, and ballpoint pens. The first three appear on a monitor, but the pens are real.

If you have any questions relating to any aspects of this research, please feel free to contact me, or my supervisor at the following addresses:

Selwyn Watkins
[redacted]
New Plymouth
Phone
Email address

Dr Mike Brennan
Department of Marketing
Massey University
Phone
Email address

Thank you for your interest

Selwyn Watkins

Appendix B

Correspondence to property owners, permits granted, letters of appreciation

NEW PLYMOUTH DISTRICT COUNCIL
newplymouthnz.com

File Ref: 013036

18 May 2005

Mr Selwyn Watkins
[redacted]
NEW PLYMOUTH

Dear Mr Watkins

CONSENT TO CONDUCT RESEARCH - 79 DEVON STREET WEST, NEW PLYMOUTH: NEW PLYMOUTH DISTRICT COUNCIL CONSOLIDATED BYLAWS, PART 9 PUBLIC PLACES (CLAUSE 12.2)

Further to our discussions on 18 May 2005 in which you propose to undertake research for a university thesis, from the Laser Force premises at 79 Devon Street West, **Consent is provided** subject to the following conditions:

1. Research carried out from 20-29 May 2005 during the hours of 9.00am-5.30pm.

2. No sale of product(s) involved and public to be courteously approached to enquire if they are willing to be part of the survey. Members of public should be approached once only. Identifying name badge to be worn and purpose of survey to be explained to the members of public.

3. Advise nearby (adjoining businesses) of activities

4. Where complaints are received by the Council for any reason, this consent may be revoked at any time during the above specified dates. Consultation with you would occur during this time.

Good luck with your project and I trust all goes well during the survey period

Yours faithfully

Lloyd Crow
ACTING MANAGER INSPECTORATE & COMPLIANCE

Massey University
COLLEGE OF BUSINESS
Kaupapa Whai Pakihi

DEPARTMENT OF MARKETING
Private Bag 11 222
Palmerston North
New Zealand
T 64 6 350 5593
F 64 6 350 2260
www.massey.ac.nz

Attention: Mr L Crow
Acting Manager Inspectorate and Compliance
New Plymouth District Council
Private Bag 2025
New Plymouth

30 May 2005

Dear Mr Crow

I would like to thank you for your assistance in helping me with my Consumer Choice research project.

During the time of the permit, I intercepted 387 consumers, which eventually resulted in 240 successful interviews. While I hoped that more consumers would be included in the programme, there were fewer consumers in town during the week because of poor weather conditions. Further, while the permit allowed me to start interviewing consumers at 9.00am, I found that most people were more interested in getting to work than stopping to help my research; the same problem was encountered after 4.00pm. In light of this I am considering an alternative location to interview a further 80 consumers; however there are no suitable sites currently available in New Plymouth, so I am now considering completing my project in Stratford.

Mr Crowe, please accept my genuine thanks for your help and I remain

Yours sincerely

Selwyn Watkins

Massey University
COLLEGE OF BUSINESS
Kaupapa Whai Pakihi

DEPARTMENT OF MARKETING
Private Bag 11 222
Palmerston North
New Zealand
T 64 6 350 5593
F 64 6 350 2260
www.massey.ac.nz

Mr Bob Patton
C/o Grand Central Hotel
[redacted]
Plymouth

17 May 2005

Dear Mr Patton

I would like to thank you for your help with my research project, which investigates the way consumers make choices. The permission to use your premises in Devon Street allows me to undertake a series of interviews with the passing public, while at the same time provide a convenient place to operate a computer and monitor.

I have been in contact with Bruce Woodhead at Harcourts, and explained to him the research I am undertaking; he is now arranging a key for the building. Further, I have been granted permission from the New Plymouth City Council to ask consumers walking past on the pavement to participate in the experiments. This permit covers various hours and extends from Friday 20th May to Sunday 29th May. I hope that this will be sufficient time to interview the required number of people.

As Mr Michael Chong has already explained to you, the above research forms part of my study towards a Masters Degree in Business Science, and your generous assistance will now make my task an easier one.

I have attached a general information sheet that explains the reasons for the study, along with the contact details of my supervisor at Massey University, Dr Brennan.

Once again, thank you for your help.

Yours sincerely

Selwyn Watkins

On Massey University Letterhead

Mr Bob Patton
P O Box x
Orakei
AUCKLAND

30 May 2005

Dear Mr Patton

I would like to thank you for your most generous assistance in helping me with my research project.

During the time I used your premises I intercepted 387 consumers, which eventually resulted in 240 successful interviews. While I had hoped for more consumers to be included in the programme, there were fewer consumers in town during the week because of poor weather conditions.

Once again Mr Patton, please accept my genuine thanks for your help and I remain

Yours sincerely

Selwyn Watkins

On Massey University Letterhead

The Mayor
Mr Jeffares
Stratford District Council
P O Box 320
STRATFORD

7 June 2005

Dear Mr Jeffares

I would like to thank you and Mr Avery for the assistance you both extended to me when helping with my research project into consumer behaviour.

I found that obtaining permission to approach local shoppers on Broadway uncomplicated. Conducting business is indeed easier in rural towns, where the complexities of compliance with local bylaws can be dispensed with through a simple handshake. During the three days that were needed to accomplish my fieldwork, I contacted 125 shoppers and these eventually resulted in 80 successful interviews.

Once again please accept my genuine thanks for your help and I remain

Yours sincerely

Selwyn Watkins

On Massey University Letterhead

Rose Sanderson and Jean Cook
R Jays
[redacted]

7 June 2005

Dear Rose and Jean

I would like to thank you both for your generous assistance in helping me with my research project.

During the three days I used your premises I intercepted 125 consumers, which eventually resulted in 80 successful interviews. While I had hoped more consumers would be included in the programme, there were fewer people in town during the week because of poor weather conditions.

I hope that your shift into your new premises was a successful and that you are now reaping the rewards for your decision to relocate.

Once again please accept my genuine thanks for your help and I remain

Yours sincerely

Selwyn Watkins

On Massey University Letterhead

Attention: Jo Lahman
Senior Environmental Health Officer
South Taranaki District Council
Private Bag 902
Hawera

23 August 2005

Dear Mrs Lahman

I would like to thank you for your assistance in helping me with my Consumer Choice research project.

During the time of the permit, I intercepted 167 consumers, which eventually resulted in 124 successful interviews. I consider this a good result for the four hours each day that I occupied the premises at 155 High Street.

Throughout the interviews, I found the local people both helpful and supportive of my research.

In closing, please once again accept my genuine thanks for your help

Yours sincerely

Selwyn Watkins

On Massey University Letterhead

Selwyn Metcalfe
Selwyn Metcalfe Limited
[redacted]

23 August 2005

Dear Mr Metcalfe

I would like to thank you for your assistance in helping me find premises in which to conduct my Consumer Choice research project.

In your absence, your staff assisted me by obtaining permission from Mrs Dobbie to use her premises, arranged the keys, and supplied advice about the best times to conduct interviews.

I have since written to Mrs Dobbie thanking her for her generous assistance.

In closing, please once again accept my genuine thanks for your help

Yours sincerely

Selwyn Watkins

On Massey University Letterhead

Mrs Dobbie
xxxx
Remuera
Auckland 1005

23 August 2005

Dear Mrs Dobbie

I would like to thank you for your generous assistance in helping me with my research project. For your information, I have attached a background information sheet that helps explain the aims of my research.

During the four days I used your premises I intercepted 167 consumers, which eventually resulted in 124 successful interviews. Overall, this was an excellent result and due, in part, to the central location of your premises. I could not have asked for a better location.

I trust that you will soon find a suitable tenant for your building.

Once again please accept my genuine thanks for your help and I remain

Yours sincerely

Selwyn Watkins

Appendix C

Questionnaire sheets

One sheet per respondent

Each respondent received all experimental treatments and questions shown

The greyed and blank sections were used for other experimental purposes

Loc Date: Time: Interviewer:

Treatment One **PowerPoint slide matches** T1

Experiment One Circle selected option

0	A Seiko	0	A Seiko	0	B Citizen	0	A Seiko
1	C Casio	1	B Citizen	1	C Casio	1	B Citizen
						2	C Casio

Experiment Two

0 C Breville

1 B Russell H

2 A Sunbeam

Experiment Three "Looking at these pens, which one do you prefer"

0	A Pental	0	A Pental	0	B Pilot	0	A Pental
1	C Stabilo	1	B Pilot	1	C Stabilo	1	B Pilot
						2	C Stabilo

	A	B	C
Q1	Seiko Q ranking	Citizen Q ranking	Casio Q ranking
	C	B	A
Q2	Breville Q ranking	Russell H Q ranking	Sunbeam Q ranking

Q3 Born 0 Female 1 Male

Q4 Without looking - what brand of watch are you wearing now? 0 No Idea 1 Clearly Knows 2 No watch

Q7 INCOME 0 Before Tax

0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J

Loc Date: Time: Interviewer:

Treatment Two **PowerPoint slide matches** T2

Experiment One Circle selected option

0 A Seiko

1 B Citizen

2 C Casio

Experiment Two

0	C Breville	0	C Breville	0	B Russell H	0	C Breville
1	A Sunbeam	1	B Russell H	1	A Sunbeam	1	B Russell H
						2	A Sunbeam

Experiment Three Not for this subject

Experiment Four "Looking at these pens, which one do you prefer"

Conventional

0 A Pental

1 B Pilot

2 C Stabilo

	A	B	C
Q1	Seiko Q ranking	Citizen Q ranking	Casio Q ranking
Q2	C Breville Q ranking	B Russell H Q ranking	A Sunbeam Q ranking

Q3 Born 0 Female 1 Male

Q4 Without looking - what brand of watch are you wearing now? 0 No Idea 1 Clearly Knows 2 No watch

Q7 INCOME 0 Before Tax

0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J

Loc Date: Time: Interviewer:

Treatment Three **PowerPoint slide matches** T3

Experiment One Circle selected option

0	C Casio	0	C Casio	0	B Citizen	0	C Casio
1	A Seiko	1	B Citizen	1	A Seiko	1	B Citizen
						2	A Seiko

Experiment Two

0 A Sunbeam

1 B Russell H

2 C Breville

Experiment Three "Looking at these pens, which one do you prefer"

0	C Stabilo	0	C Stabilo	0	B Pilot	0	C Stabilo
1	A Pental	1	B Pilot	1	A Pental	1	B Pilot
						2	A Pental

	C	B	A
Q1	Casio Q ranking	Citizen Q ranking	Seiko Q ranking
	A	B	C
Q2	Sunbeam Q ranking	Russell H Q ranking	Breville Q ranking

Q3 Born 0 Female 1 Male

Q4 Without looking - what brand of watch are you wearing now? 0 No Idea 1 Clearly Knows 2 No watch

Q7 INCOME 0 Before Tax

0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J

Loc Date: Time: Interviewer:

Treatment Four **PowerPoint slide matches** T4

Experiment One Circle selected option

0 C Casio

1 B Citizen

2 A Seiko

Experiment Two

0	A Sunbeam	0	A Sunbeam	0	B Russell H	0	A Sunbeam
1	C Breville	1	B Russell H	1	C Breville	1	B Russell H
						2	C Breville

Experiment Three "Looking at these pens, which one do you prefer"

0 C Stabilo

1 B Pilot

2 A Pental

	C	B	A
Q1	Casio Q ranking	Citizen Q ranking	Seiko Q ranking
	A	B	C
Q2	Sunbeam Q ranking	Russell H Q ranking	Breville Q ranking

Q3 Born 0 Female 1 Male

Q4 Without looking - what brand of watch are you wearing now? 0 No Idea 1 Clearly Knows 2 No watch

Q7 INCOME 0 Before Tax

0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J

Loc Date: Time: Interviewer:

Treatment Five **PowerPoint slide matches** T5

Experiment Four Circle selected option

0	B Citizen	0	B Citizen	0	A Seiko	0	B Citizen
1	C Casio	1	A Seiko	1	C Casio	1	A Seiko
						2	C Casio

Experiment Five Price constant

Constant sum - preliminary

Experiment Six Constant sum

Q1 Born 0 Female 1 Male

Q7 INCOME 0 Before Tax

0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J

Loc Date: Time: Interviewer:

Treatment Six **PowerPoint slide matches** T6

Experiment Four Circle selected option

0 B Citizen

1 A Seiko

2 C Casio

Experiment Five Price constant

Constant sum - preliminary

Experiment Six Constant sum

Q1 Born 0 Female 1 Male

Q7 INCOME 0 Before Tax

0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J

Loc Date: Time: Interviewer:

Treatment Seven **PowerPoint slide matches** T7

Experiment Four Circle selected option

0	B Citizen	0	B Citizen	0	C Casio	0	B Citizen
1	A Seiko	1	C Casio	1	A Seiko	1	C Casio
						2	A Seiko

Experiment Five Price constant – Made in China

Constant sum - preliminary

Experiment Six Constant sum

Q1 Born 0 Female 1 Male

Q7 INCOME 0 Before Tax

0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J

Loc Date: Time: Interviewer:

Treatment Eight **PowerPoint slide matches** T8

Experiment Four

0 B Citizen

1 C Casio

2 A Seiko

Experiment Five Price constant – Made in China

Constant sum - preliminary

Experiment Six Constant sum

Q1 Born 0 Female 1 Male

Q7 INCOME 0 Before Tax

0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J

Appendix D

Electric toaster survey – establishment of brand, attributes, & prices for experiment two

Toaster Survey - In store displays - New Plymouth – Over the period of March – April 2005												
Features As shown on display container or shelf label	Breville Emporia	Russell Hobbs Classic Satin	Sunbeam Toastum	Brio	Zip Retro Elegance	Kambrook Wide Slice	Sanyo SKS-B2	Sanyo Cool Touch	Cascade Cool Touch	Mistral Classique	Home Choice	Bosch
Everyday price	59.99	69.99	69.99	11.99	59.99	59.99	49.99	29.99	24.99	49.99	24.95	79.95
Retailer	Briscoes	Farmers	Briscoes	W House	Briscoes	Briscoes	W House	W House	W House	W House	Countdown	Harvey N
Everyday price	79.99		79.99									
Retailer	Harvey N		Farmers									
Sale price	39.95	64.49	59.99	9.99	24.95	29.99						
Sale price			75.99		19.99							
Slices of bread	2	2	2	2	2	2	2	2	2	2	2	2
Cool touch body CT)		Y	Y		Y			Y				-
Wide slots	Y	Y	Y		Y	Y	Y	Y		Y	Y	Y
Extra or high lift ever	Y	Y	Y		Y	Y	Y	Y			Y	Y
Browning control	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y
Stainless steel	Y	Y	Y								Y	Y
Cord storage (CS)	Y	Y	N				Y					-
Warranty or Guarantee (months)	12		12		12	12			24	36		-
Made in China (C)	Y	Y	Y	Y	-	-	Y	Y	Y	Y	Y	-
Made elsewhere												

Y = has features - = uncertain if has these features

Toasters and features used in Experiment 2

Price, cord storage, and cool touch sides applied (displayed) to subjects in replication groups.
Made in China, price cord storage, and cool touch sides applied (displayed) only to subjects in experiment 5 (not shown in this thesis)

Feature displayed on carton or shelf label	**Breville Emporia**	**Russell Hobbs Classic Satin**	**Sunbeam Toastum**
Price	59.95	69.95	79.95
Cord storage (CS)	X	X	
Cool touch sides (CT)		X	X
Warranty or Guarantee (months)	12		12
Made in China	X	X	X

Appendix E

Pilot study to establish brand, attributes, and prices for experiment 3

Introduction, method and rationale

To help establish ballpoint pen prices and overall quality ratings for experiment 4 in the main study, 14 consumers were asked to place four differing pens in order of their perceived quality, then in a following task match the same pens with a range of retail prices. The consumers were chosen to represent a range of ages (19-90), gender (7F; 7M), and occupations (retired, receptionists, accountants, financial controllers, homemakers, and teachers). Interviews were undertaken either at home or in the workplace.

The respondent was hand all four pens at the same time in one bundle to help reduce ordering effects. Next, they received written instructions that asked them to

> "Place the pen they personally though were of the poorest quality first, followed by the next best, and so on until they placed the pen they considered of the highest quality last".

They also received a verbal instruction along the same lines as the written instructions. The respondent was told to place the pens in order starting with the "worst quality to the best quality" or from "worst first to best last". The position of the pens was used as ranking, coded from "1" to represent the poorest quality, to "4" representing the highest quality pen.

A second objective of the pilot study was to set realistic prices for the pens in experiment 4. After collecting the pens from the first task, the same consumers were again asked to,

> "Match each pen with one of the retail prices I am giving to you [handed pens first in a bundle, along with price cards also in a buddle]. There are more prices than pens, and you can only place one price under each pen".

By offering the respondent the same pens all at once, this helped reduce ordering effects, while at the same time required them to distinguish between the same pens. Prices were printed on eight small 30mm square cards, which made for easy handling by both the respondent and interviewer. These prices included the actual price paid for each of the different pens, along with a range of other representative prices chosen from a survey of shelf prices from the same retailer. A list of these prices along with the actual prices used in the survey is shown in Table 2. After handing both the pens and prices to the respondent, they were then left to sort out and match one price to each pen, without any further assistance or comment.

Results and analysis

Procedure

Consumers had little trouble in sorting out the quality rankings, with the majority using each pen to make a scribble, sign their name, or roll them around in their hand to closely inspecting them. Verbal comments during judgement usually referred to the ease or smoothness of writing, or "this one is nice to hold". The time taken for judgement ranged from 30 seconds to several minutes. Once the subject decided on the rankings, they seemed happy with their selection, only a few wanted to rearrange the order of the middle pens after asked if they were happy with the order.

The pricing task was clearly more complex than judging quality. The reordering and matching of retail prices to pens caused greater difficulty for virtually all consumers. Most said they had no idea about the retail prices of pens for they rarely purchased them; they relied on free promotional pens for everyday use. Having previously sorted the pens into quality order, they often used the same strategy in an attempted to match pens to price cards. When positioning the cards to pens, some subjects made many attempts to do so. It was as if judgement and reasoning was connected to physically touching or handling the object under consideration. Such attempts were often accompanied by reasons for their choice (not recorded), along with self-doubts about the accuracy of their decisions. Typical vocalised reasons were commonplace, for example, 'This is a good brand (Pental)', or 'it has to be worth more than 99 cents (gave it $2.19)'.

Quality Rankings
Table 3 shows the quality rankings from the first task. Stabilo and Pental respectfully are the worst and the best quality. While the sample size is very small (n=14), both the mean and the median show these pens are clearly opposite each other in terms of perceived quality (Stabilo mean 1.7, median 1; Pental mean 3.1, median 4). It was less clear which pens ranked second or third.

Verification of the quality ratings was also supported by rating each respondent's pricing response, to give a price-as-quality ranking. When consumers received instructions to match retail prices to pens, many first tried to place them into some kind of order before applying prices. While such an action may be one of convenience or a carry over from the previous task, it may also be part of some price-to-quality strategy. Choice strategies based on price are well documented in the literature. Stoetzel (1954) observed buyers are often uncertain about the quality of products and what constitutes a 'just' price; and that buyers have a psychological price band or range of acceptable prices which they use as a judgement scale during the assessment of prices in a particular product category (Munroe, 2003, p.129). As early as 1936 (Ginzberg, 1936), various studies have shown that unexplained changes in demand can be induced through simply framing the ending prices with odd digits ("9" or "5"). More curiously, by ending prices with even numbers this can infer an image of superior quality over those ending in odd numbers (Stiving and Winer, 1997). This pilot study used actual shelf prices, although it may be advisable to use even numbers in experiment 3 of the main study to help avoid confounding the study with such pricing effects.

In aggregate, the price-as-quality rankings were the same as the quality-without-price rankings (see Table 3 and 4). However, on closer inspection of individual results, there appears greater inconsistency between rankings than would have been expected.

The previous task asked that pens be ranked in order of their quality, so it should have been reasonably easy for the poorest and highest quality pens to be quickly isolated from the middle pens, and that these should then receive the same rankings as before (1 or 4 respectively); if price is also a good indicator of quality. While accepting that the sample is very small (n=14), results in Table 5 show that only half (50%) of all pens received the same rankings, while a third (34%) differed in their rankings by one place (1). Explanation of such a result could be due to changes in respondent judgement or new reasoning on some other dimension, for example, one pen may look more attractive than another and therefore deserving of a higher price even though its quality is less than another pen. The balance of ranking differences (15%) is more difficult to explain. However, differences were greatest on the middle quality-price options (Pilot and Sarasa), than for the highest and lowest quality pens. Possibly these variations to both rankings (quality and price-quality) was due to the high degree of similarity between them in terms of quality, appearance, and the range of unused prices that were yet to be applied once both the higher and lower prices were decided on.

Price
There was a large difference between the purchase price of the Stabilo pen and that allotted by consumers. Taking either the median (2.19) or the mean (2.68) showed a difference of $1.20 or $1.69; this seemed very large when only 99 cents was the actual purchase price. The pilot pen was the most accurately priced by consumers, only 15 cents from the purchase price if using the median value (3.14). The median in this survey was considered a better measure than the mean because of outliers and a low sample size (see Table 5 and 6). Again using the median value (2.99), the Sarasa price was $1.00 less than the purchase price, as was Pental (median 3.99).

Conclusion and recommendation
While the sample size used in this survey is very small, it is considered to be sufficient to recommend which pens and which prices should be used in the main study. The recommendation is:

- Stabilo be used as the lowest quality, lowest price pen $2.10
- Pilot be used as the medium quality, medium priced pen $3.10
- Pental be used as the highest quality, highest priced pen $4.10

Table 1. Details of ballpoint pens included in study

Features	Stabilo Retract 308M41	Pilot Supergrip BPGP-10R-M-L BSRF 6M 0411	Sarasa Zebra JJB3-BL	Pental Meteor Deluxe BK83MB-C
Price at Warehouse St	0.99	3.29	3.99	4.99
Diff to next highest $	2.30	0.70	1.00	-
Ink colour	Light Blue	Medium Blue	Dark Blue	Medium Blue
Ball writing width (mm)	0.4	0.4	0.7	1.0
Retracts nib from the...	Side	End	End	End
Pocket clip shape	Plain	Plain	Curved	Curved
Rubber writing grip	No	Yes	Yes	Yes
See through body	Yes	Yes	Yes	Yes
General body colour	Light blue	Dark blue	Medium blue	Very dark blue
Weight (gm)	8	10	10	16
Pocket clip to tip (mm)	120	112	122	113
Girth holding Tip (mm)	28	33	35	37

Table 2. Survey of shelf prices of assorted ballpoint pens

Warehouse Stationary 21 April, 2005

> $0.90	> $2.00	> $3.00	> $4.00	> $5.00	> $6.00	> $7.00
0.99	2.19	3.29	4.29	5.29	6.99	7.99
1.49	2.99	3.39	4.49	5.49	6.99	
	2.99	3.99	4.99	5.79		
	2.99					

Statistics: n 18; Min 0.99; Q1 2.99; Median 4.14; Q3 5.57, Max 7.99; Mean 4.25; St Dev 1.92

Prices used in pilot study (30mm square) (30 pt. type)	0.99 (Stabilo)	2.19	2.99	3.29 (Pilot)
	3.99 (Sarasa)	4.49	4.99 (Pental)	5.49

Table 3. Quality rankings of pens

n = 14	Stabilo	Pilot	Sarasa	Pental
Quality ranking	1	2=	2=	4
Mean	1.7	2.5	2.6	3.1
Median	1	2.5	3	4
Standard Dev	1	0.8	1.2	1.2
SE Mean	0.27	0.2	0.3	0.31

Table 4. Price-as-quality ranking*

N = 14	Stabilo	Pilot	Sarasa	Pental
Price-as-quality rank	1	2=	2=	4
Mean	1.8	2.5	2.2	3.5
Median	1	2.5	2	4
Standard Dev	1.19	0.94	0.98	0.65
SE Mean	0.32	0.25	0.26	0.17

* Price-as-quality is the ranking in ascending order of selected retail prices, and the assumption that the higher the price the higher the quality.

Table 5. Difference between Quality ranking and Price-as-quality ranking

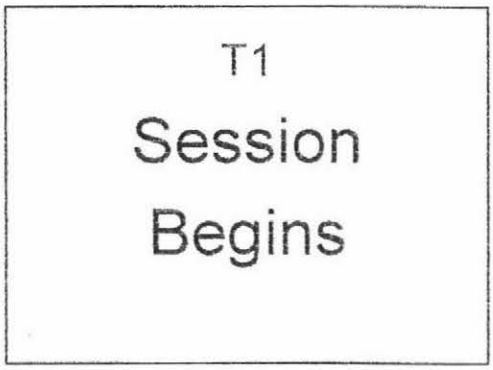
Counts n=14	Stabilo	Pilot	Sarasa	Pental	Total	% of total
No difference	7	4	7	10	28	50
Differing by 1	5	8	4	2	19	34
Differing by 2	1	2	3	1	7	13
Differing by 3	1	0	0	1	2	2
	14	14	14	14	56	100

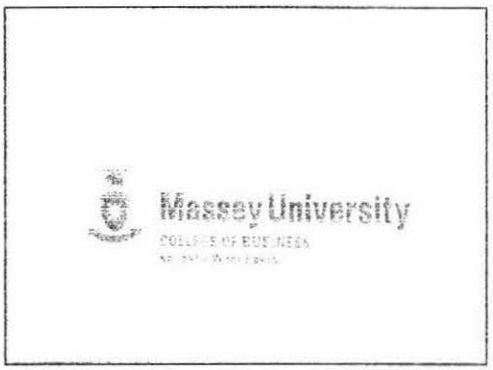
Table 6. Price ($)

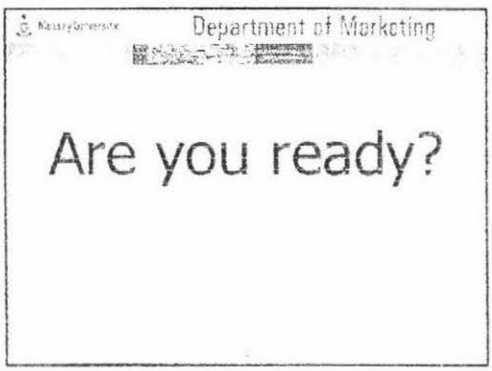
N = 14	Stabilo	Pilot	Sarasa	Pental
Mean	2.68	3.23	3.08	4.03
Median	2.19	3.14	2.99	3.99
SE Mean	0.4	0.2	0.29	0.19
Standard Dev	1.50	0.7	1.08	0.7
Purchase price	0.99	3.29	3.99	4.99
Purchase less median	-1.20	0.15	1.00	1.00
Recommended Price	2.10	3.10	Reject	4.10

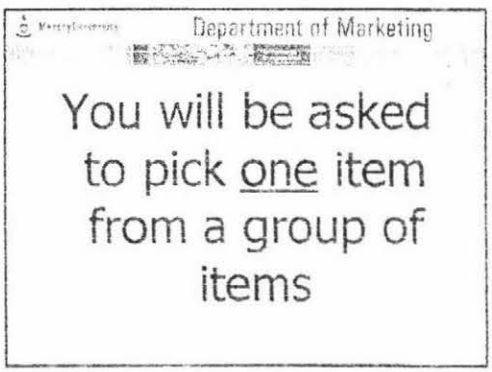
Appendix F

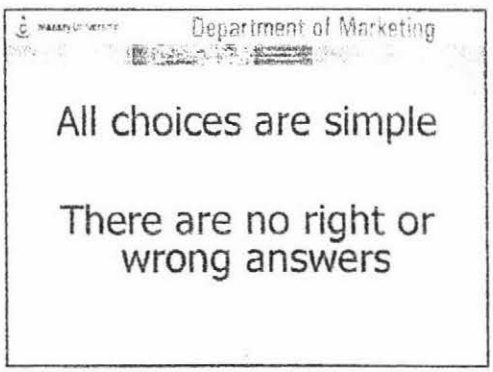
Example of one complete PowerPoint slide show

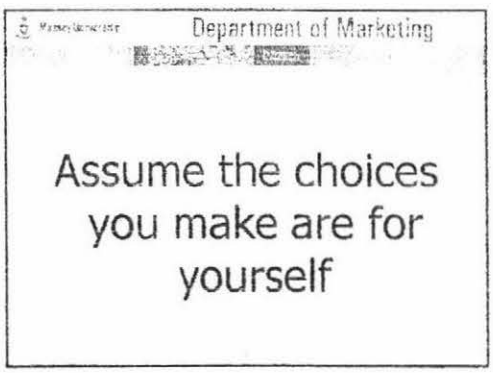












Department of Marketing

We will not record your name

All information will be used for research purposes only

Department of Marketing

Any questions?

Imagine you are purchasing a new watch from your favourite shop

All the wristwatches you are considering have

- Day and Date Indicators
- Leather Straps, and are
- Water Resistant

Which watch do you prefer?

Seiko $189

Casio $129

Which watch do you prefer?

Seiko $189

Citizen $159

Which watch do you prefer?

Citizen $159

Casio $129

Which watch do you prefer?

Seiko $189

Citizen $159

Casio $129

Department of Marketing

Now please consider a new set of products

Imagine you are purchasing a 2 slice electric toaster

Which toaster do you prefer?

Breville	Russell Hobbs	Sunbeam
• Cord storage • 12-month guarantee	• Cord storage • Cool touch sides	• Cool touch sides • 12-month guarantee
$59.95	$69.95	$79.95

Department of Marketing

Now please consider a new set of products

Imagine you are purchasing a ballpoint pen

Look at the pens being shown to you

Which pen do you prefer

You can use the pens if you want

Thinking about wristwatches, which of the following do you think has the highest quality

Seiko
Citizen
Casio

Second, which wristwatch do you think has the lowest quality

Thinking about toasters, which of the following do you think has the highest quality

Breville	Russell Hobbs	Sunbeam
• Cord storage • 12-month guarantee	• Cord storage • Cool touch sides	• Cool touch sides • 12-month guarantee

Second, which toaster do you think has the lowest quality

Department of Marketing

Now for some questions about yourself

Remember we do not record names
This information is for research only

In which year were you born

Without looking

What brand of watch are you wearing now

Since this time last year

Have you been involved in the selection of a wristwatch for yourself or anyone else

Since this time last year

Have you been involved in the selection of a toaster for yourself or anyone else

Department of Marketing

The last question is about your household

You only need say the letter next to your selection

Which letter best describes the total yearly income of everyone in your household from all sources

A	$10,000 or less
B	11,000 to 20,000
C	21,000 to 30,000
D	31,000 to 40,000
E	41,000 to 50,000
F	51,000 to 60,000
G	61,000 to 70,000
H	71,000 to 80,000
I	81,000 to 100,000
J	101,000 or more

Department of Marketing

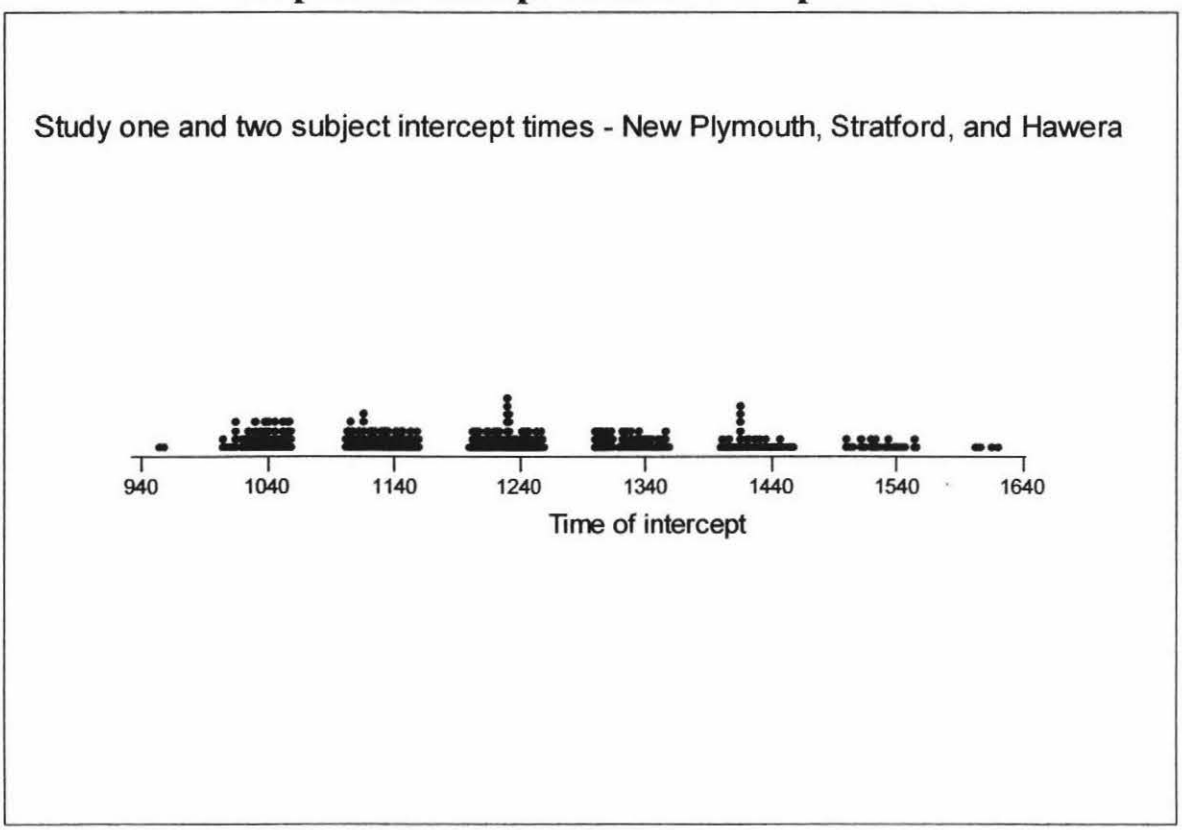
This ends our research session

We ask that you do not reveal to others the questions or products we have shown you

Thank you for your help

Appendix G

Dot plot of intercept times for all experiments



Appendix H

Background factors and adjustment weights for experiment 3

Gender	Household Income	Age	Step group	Sim group	Total	Adjustment Weight
Female	$40,000 and under	Young 18-35 years	9	6	15	0.67
		Middle 35-53 years	9	5	14	0.56
		Older 54-87 years	18	9	27	0.50
		Total	36	20	56	
	$41,000 to $70,000	Young 18-35 years	7	14	21	2.00
		Middle 35-53 years	12	9	21	0.75
		Older 54-87 years	4	4	8	1.00
		Total	23	27	50	
	$71,000 and over	Young 18-35 years	4	11	15	2.75
		Middle 35-53 years	11	13	24	1.18
		Older 54-87 years	9	3	12	0.33
		Total	24	27	51	
Male	$40,000 and under	Young 18-35 years	5	7	12	1.40
		Middle 35-53 years	7	4	11	0.57
		Older 54-87 years	9	17	26	1.89
		Total	21	28	49	
	$41,000 to $70,000	Young 18-35 years	4	6	10	1.50
		Middle 35-53 years	4	11	15	2.75
		Older 54-87 years	5	5	10	1.00
		Total	13	22	35	
	$71,000 and over	Young 18-35 years	4	6	10	1.50
		Middle 35-53 years	14	6	20	0.43
		Older 54-87 years	7	6	13	0.86
		Total	25	18	43	
Total			142	142	284	

Note: The sample size for experiment 3 differed to experiments 1 and 2 for it includes 40 additional consumers who were diverted from experiment 4.

Appendix I

Background factors and adjustment weights for experiment 4

Gender	Household Income	Age	Step group	Sim group	Total	Adjustment Weight
Female	$40,000 and under	Young 18-35 years	9	8	17	0.89
		Middle 35-53 years	5	6	11	1.20
		Older 54-87 years	6	9	15	1.50
		Total	20	23	43	
	$41,000 to $70,000	Young 18-35 years	5	6	11	1.20
		Middle 35-53 years	6	8	14	1.33
		Older 54-87 years	7	6	13	0.86
		Total	18	20	38	
	$71,000 and over	Young 18-35 years	8	8	16	1.00
		Middle 35-53 years	4	5	9	1.25
		Older 54-87 years	4	2	6	0.50
		Total	16	15	31	
Male	$40,000 and under	Young 18-35 years	4	8	12	2.00
		Middle 35-53 years	3	4	7	1.33
		Older 54-87 years	5	7	12	1.40
		Total	12	19	31	
	$41,000 to $70,000	Young 18-35 years	2	2	4	1.00
		Middle 35-53 years	7	2	9	0.29
		Older 54-87 years	7	4	11	0.57
		Total	16	8	24	
	$71,000 and over	Young 18-35 years	8	9	17	1.13
		Middle 35-53 years	6	1	7	0.17
		Older 54-87 years	4	5	9	1.25
		Total	18	15	33	
Total			100	100	200	

Appendix J

Background effects of gender on choice – sundry tables

Experiment 1
Effect of gender on the choice of wristwatches

	Stepwise				Simultaneous			
	Female		Male		Female		Male	
	n	%	n	%	n	%	n	%
A Seiko + B Citizen	27	43	33	55	27	43	33	55
C Casio	35	57	27	45	35	57	27	45
Total	62	100	60	100	62	100	60	100

Note: For females and males, A+B,C, $\chi^2 = 1$, df = 1, p = 1

Experiment 2
Effect of gender on the choice of electric toasters

	Stepwise				Simultaneous			
	Female		Male		Female		Male	
	n	%	n	%	n	%	n	%
A Sunbeam + B Russell Hobbs	44	71	39	65	50	81	43	72
C Breville	18	29	21	35	12	19	17	28
Total	62	100	60	100	62	100	60	100

Note: For females, A+B,C, $\chi^2 = 1.58$, df = 1, p = .208; males, A+B,C, $\chi^2 = .62$, df = 1, p = .432

Experiment 3
Effect of gender on the choice of ballpoint pens

	Stepwise				Simultaneous			
	Female		Male		Female		Male	
	n	%	n	%	n	%	n	%
A Pental + B Pilot	50	78	46	68	56	76	52	77
C Stabilo	14	22	22	32	18	24	16	23
Total	64	100	68	100	74	100	68	100

Note: For females, A+B,C $= \chi^2 = .1$, df = 1, p = .734; males, A+B,C, $\chi^2 = 1.3$, df = 1, p = .252

Appendix K

Background effects of household income on choice – sundry tables

Experiment 1
Effect of household income on the choice of wristwatches

	Stepwise						Simultaneous					
	$40,000 and under		$41,000 to $70,000		$71,000 and over		$40,000 and under		$41,000 to $70,000		$71,000 and over	
	n	%	n	%	n	%	n	%	n	%	n	%
A Seiko + B Citizen	21	50	19	43	20	57	22	52	21	48	17	47
C Casio	21	50	25	57	15	43	20	48	23	52	19	53
Total	42	100	44	100	35	100	42	100	44	100	36	100

Note: For $40k and under, A+B,C, $\chi^2 = .04$, df = 1, p = .827; $41k to $70k A+B,C, $\chi^2 = .183$, df = 1, p = .669; $71k and over, A+B,C, $\chi^2 = .7$, df = 1, p = .403.

Experiment 2
Effect of household income on the choice of electric toasters

	Stepwise						Simultaneous					
	$40,000 and under		$41,000 to $70,000		$71,000 and over		$40,000 and under		$41,000 to $70,000		$71,000 and over	
	n	%	n	%	n	%	n	%	n	%	n	%
A Sunbeam + B Russell Hobbs	31	74	28	64	24	66.7	34	81	31	70.5	28	80
C Breville	11	26	16	36	12	33.3	8	19	13	29.5	7	20
Total	42	100	44	100	36	100	42	100	44	100	35	100

Note: For $40k and under, A+B,C, $\chi^2 = .612$, df = 1, p = .434; $41 to $70k A+B,C, $\chi^2 = .463$, df = 1, p = .496; $71k and over, A+B,C, $\chi^2 = 1.61$, df = 1, p = .205.

Appendix L

Background effects of age on choice

Experiment 1
Effect of age on the choice of wristwatches

	Stepwise						Simultaneous					
	Young 18 to 35 years		Middle 36 to 53 years		Older 54 to 87 years		Young 18 to 35 years		Middle 36 to 53 years		Older 54 to 87 years	
	n	%	n	%	n	%	n	%	n	%	n	%
A Seiko + B Citizen	12	28	23	58	26	67	17	39	21	53	22	56
C Casio	31	72	17	42	13	33	26	61	19	47	17	44
Total	43	100	40	100	39	100	43	100	40	100	39	100

Note: For young, A+B,C, $\chi^2 = 1.301$, df = 1, p = .254; middle, A+B,C, $\chi^2 = .202$, df = 1, p = .653; older, A+B,C, $\chi^2 = .867$, df = 1, p = .352.