

The Effect of Paired Comparisons and Income on Choice

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Abstract

This study reports three experiments that tested the assertion of 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, are more likely to choose the cheapest option than those who choose directly from the triple set. The study also tested the suggestion of Brennan and Laafai (2003) that these context effects may be moderated by respondent income. Since none of the observed differences in choice were statistically significant, the results of the present study provide no support for either of the hypothesised context or income effects on choice.

Keywords: Context effects; choice experiments

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Introduction

A number of researchers have attempted to develop models to explain how consumers choose between similar alternative options that differ in terms of price and quality. These models are important because the assumptions on which they are based are used in econometric models to make predictions about consumer behaviour. However, different models make very different assumptions about how consumers behave in choice situations. For example, one assumption is that a new offering will take share from others in proportion to their original shares (Luce, 1959), another is that new offerings will take disproportionately more share from alternatives similar to it (Tversky, 1972), and yet another is that choice is independent of context, and will depend on the subjective value of the item (Simonson and Tversky, 1992). However, the empirical evidence in support of these models is somewhat contradictory (Huber, Payne and Puto, 1982; Payne, Bettman & Johnson, 1992). Thus, even though many of these models have been in existence for many years, there is still a need for testing and replication.

The 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) (Simonson and Tversky, 1992). The implication of this value-maximisation concept is that preference is independent of context, as defined by the set of alternatives under consideration. However, there is evidence that the traditional view is flawed, at least in some circumstances, due to an assumption of proportionality.

Proportionality proposes that the introduction of a new offering into an existing choice set will take share from the other options in the same proportion as their original shares (Luce, 1959). This concept has acted as the basis for many early choice models designed to predict share (for example, Luce, 1959; Reibstein, 1978; Silk & Urban, 1978). Yet, as Huber et al. (1982) point out, the assumption of proportionality has been shown to be a poor predictor of product share, and 'new products [often] take more share from those similar to it than from dissimilar items' (Huber, Payne and Puto, 1982, p.90).

In a series of studies investigating these irregularities, Simonson and Tversky (1992) and Simonson et al. (1993) have conducted numerous experiments to examine the effects of context on choice. In particular, Simonson et al. (1993) argue that the manner in which local choice sets are evaluated influences local preferences, which in turn influences final choice, due to a *tradeoff contrast effect* (Simonson and Tversky, 1992). Tradeoff Contrast is said to occur when the tendency to prefer an alternative is enhanced or hindered depending on whether the tradeoffs within the set under consideration are favourable or unfavourable to the option (Simonson and Tversky 1992). One of the specific claims of Simonson and Tversky is that choice can be influenced merely by the process of comparing options in pairings before making a final choice from a full set, and furthermore, that this pair-comparison process tends to favour the selection of lower price-quality options. That is, when options are compared in a pair-wise manner before making a choice, higher price-quality options tend to lose share to lower price-quality options.

Simonson and Tversky (1992) found that respondents who made paired comparisons before selecting from the complete set were more likely to select the cheapest brand than those who considered the complete set only. For example, for one product category, the share of the cheapest option (41%) was almost twice as high in the paired version than in the single

complete version (26%). Similar results were also consistently observed across three product categories.

This issue of context effects on choice behaviour is not just of academic interest, but is of considerable importance for retailers, since retailers typically display a range of brands and models for consumers to consider. The idea that context, as provided by the range of options displayed and the way in which they are ordered on the shelves, or presented by a salesperson, can affect choice, has serious implications for profitability. It would be useful, and important, to know whether a particular arrangement, would prompt consumers to choose a lower rather than higher priced offering, whereas an alternative arrangement may prompt them to choose a more expensive item, even though the options available are the same.

While Simonson et al. (1993) report the results of a series of experiments that support their claims about the effects of paired comparisons on choice, few independent replication studies appear to have been published. In a relatively recent replication study, Brennan and Laafai (2003) failed to confirm Simonson's results, but did observe a significant effect due to respondent income. They noted that as total income increased, preference for the more expensive items also increased, and consumers with income less than \$25,000 clearly preferred the cheaper option in all the pairs. However, as income increased, preference also shifted from the cheaper option to the more expensive items. The fact that respondents in the study of Simonson et al. (1993) were students, and so presumably in a lower income bracket, may help explain the differences in outcome for the two studies.

Thus the purpose of the current study was to test the following hypothesis:

- H1. 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 chose directly from the triple set.
- H2. The context effects examined in H1 will depend upon respondents' level of income.

Method

Three experiments were conducted using face-to-face interviews with the 444 respondents. The subjects involved in all three 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.

Each experiment used a different product (wristwatch, toaster, or pen), each with three different brands and price-quality levels (see Tables 1, 2 and 3). The purpose of each experiment was to compare the choices under two conditions, labelled Stepwise and Simultaneous. Under the Stepwise condition, respondents chose one option from each of three paired options before making a final choice from all three options. Thus respondents under the Step condition made four separate choices. Under the Simultaneous condition, respondents were only asked to choose one option from the set of three.

These experiments replicated experiments of Simonson, Nowlis and Lemon (1993) and Brennan and Laafai (2003), where Stepwise pairings were displayed as {A, C}, {A, B}, {B, C}. The Simultaneous sets were {A, B, C}, where A = highest price/quality, B = mid

price/quality, C = lowest price/quality. These previous studies dictated the products and price points used, since the purpose of this study was to confirm (or disconfirm) their findings.

Results

The results for the choices are presented in Tables 1, 2 and 3 respectively for the three products (wristwatches, toaster and pens). While the choice for all three options is presented in each table, the option of concern in these experiments is Option C.

Table 1. Effect of presentation on the choice of wristwatches

		Stepwise		Simultaneous	
		N	%	n	%
A	Seiko \$189	37	30	30	24.5
B	Citizen \$159	23	19	30	24.5
C	Casio \$129	62	51	62	51
Total		122	100	122	100

Note. 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 $\chi^2 = 1.655$, $df = 2$, $p > .3$

Table 2. Effect of presentation on the choice of toasters

		Stepwise		Simultaneous	
		N	%	n	%
A	Sunbeam \$79.95	28	23	32	26
B	Russell Hobbs \$69.95	55	45	61	50
C	Breville \$59.95	39	32	29	24
Total		122	100	122	100

Note. 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 $\chi^2 = 2.04$, $df = 2$, $p > .3$

Table 3. Effect of presentation on the choice of ballpoint pens

		Stepwise		Simultaneous	
		n	%	n	%
A	Pental \$4.10	78	55	70	49
B	Pilot \$3.10	32	22.5	38	27
C	Stabilo \$2.10	32	22.5	34	24
Total		142	100	142	100

Note. 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 $\chi^2 = 3.426$, $df = 2$, $p > .1$

Simonson et al. (1993) argue that the pairwise comparisons will increase the likelihood that respondents will choose the lower price/quality item. Thus the question addressed in this analysis is whether or not making pairwise comparisons before choosing from all three options (stepwise condition) leads to a higher proportion of choices of Option C than when the choice is not preceded by pairwise comparisons (simultaneous condition).

For all three products, the pairwise procedure made no difference to the outcome. Thus H1 is not supported, and the results fail to support the findings of Simonson et al. (1993), but are consistent with the findings of Brennan and Laafai (2003). Conversely, the results also show that the pairwise procedure does not lead to an increased likelihood of respondents choosing

the higher quality/higher priced option (Option A) either. These results raise the question of why both Brennan and Laafai (2003) and the present study failed to replicate the results reported by Simonson et al. (1993). A possibility raised by Brennan and Laafai (2003) is that the effects of context in choice situations where price and quality are the salient variables may depend on respondent income.

The effects of respondent income on choice are displayed in Tables 4, 5 and 6. In these tables, the result for Options A and B are combined, as it is the effect of Option C that is of primary concern, and the cell sizes are too small otherwise. None of the differences between Stepwise and Simultaneous are statistically significant, thus H2 is not supported. The results do not support the suggestion of Brennan and Laafai (2003) that income is an important moderator of choice.

Table 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	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**.

Table 5. 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	67	34	81	31	70	28	80
C Breville	11	26	16	36	12	33	8	19	13	30	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**.

Table 6. 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 Pentac +	37	77	24	62	35	78	34	71	38	78	36	80
B Pilot												
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**

Conclusions

The present study found no evidence to support the claim that pairwise comparisons of alternatives prior to choosing from the entire set of alternatives, increases the likelihood of choosing the lower quality/lower priced option, or even that it affects the choices made in any consistent manner. These results support similar conclusions from Brennan and Laafai (2003), but fail to support the findings of Simonson et al. (1993).

There is no obvious reason for this failure to replicate the results of Simonson et al. (1993), although some of the products, brands and actual prices varied across studies to suit local conditions, and the possible effects of these variations are unknown. The approach adopted to deal with these limitations is to undertake multiple replication studies under varying conditions, and this study is just one of those. It is possible that the different results are due to differences in cultural values and/or economic conditions between New Zealand and the USA, and of course there are considerable time differences (1993 vs 2009) between the studies, which raises the likelihood of changes in consumers' perceptions of value over time. However, given that the context effects under examination are presented by Simonson and others as being almost law-like, and hardwired into human perception, one would expect the effects to be robust.

The finding of Brennan and Laafai (2003) that respondent income had a significant effect on the choice behavior provided a possible explanation for the failure to replicate the results of Simonson et al (1993), since there were certainly differences in participant characteristics between the two studies (US undergraduate college students vs NZ members of the general public), and it is likely that a higher proportion of the college students belonged to lower income categories compared with the New Zealand sample. If so, one would expect that this would contribute to differences in perceptions of value among respondents in the two studies, and therefore to differences in choice behaviour. However, since the present study failed to replicate the findings of Brennan and Laafai (2003), this explanation is not supported by the present data.

In conclusion, while the reasons for the differences in results across the three studies is unclear, the present results, coupled with those of Brennan and Laafai (2003), suggest that the effects reported by Simonson et al (1993) are not as generalisable as implied, and that further work is required to identify the boundary conditions for local context effects.

References

- Brennan, M., Laafai, M., 2003. The effects of context on choice. Paper presented at the proceedings of the Chartered Institute of Marketing, Sydney, August 20-22, 2003 [CD ROM].
- Huber, J., Payne, J.W., Puto, C., 1982. Adding asymmetrically dominated alternatives: Violations of regularity and the similarity hypothesis. *Journal of Consumer Research*, 9 (June), 90-98.
- Luce, R.D., 1959. *Individual Choice Behaviour*. New York: John Wiley & Sons Inc.
- Payne, J.W., Bettman, J.R., Johnson, E.J., 1992. Behavioural decision research: A constructive processing perspective. *Annual Review of Psychology*, 43, 87-131.
- Reibstein, D., 1978. The prediction of individual probabilities of brand choice. *Journal of Consumer Research*, 5 (December), 163-168.
- Silk, A.J., Urban, G.L., 1978. Pre-test market evaluation of new packaged goods: A model and measurement methodology. *Journal of Marketing Research*, 15 (May), 171-191.
- Simonson, I., Nowlis, S., Lemon, K., 1993. The effect of local consideration sets on global choice between lower price and higher quality. *Marketing Science*, 12(4 Fall), 357-377.
- Simonson, I., Nowlis, S.M., 2000. The role of explanations and need for uniqueness in consumer decision making: Unconventional choices based on reasons. *Journal of Consumer Research*, 27 (June), 49-68.
- Simonson, I., Tversky, A., 1992. Choice in context: Tradeoff contrast and extremeness aversion. *Journal of Marketing Research*, 29 (August), 281-295.
- Tversky, A., 1972. Elimination by aspects: A theory of choice. *Psychological Review*, 79, 281-199.