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Relational aspects of decisions to sell

Therese Jefferson^a

Corresponding Author

^aCurtin Graduate School of Business

Curtin University

GPO Box U1987

Perth, Western Australia 6845

AUSTRALIA

Email: Therese.Jefferson@cbs.curtin.edu.au

Phone: +61 8 9266 3724

Fax: +61 8 9266 3368

Ross Taplin^b

^bSchool of Accounting

Curtin University

GPO Box U1987

Perth, Western Australia 6845

AUSTRALIA

Email: Ross.Taplin@cbs.curtin.edu.au

Phone: + 61 8 9266 3033

Fax: + 61 8 9266 7196

Abstract

Mental accounting has been identified as an important source of non-fungibility in household and individual decision making. Ostensibly uniform assets, including cash, are perceived differently according to their originating source. In this study we examine assumptions of fungibility by using scenarios within a factorial survey to compare the effects of four specific factors on individuals' willingness to trade a specified possession that varies according to its relational source, dollar value, uniqueness and the potential buyer's identity. Two measures of willingness to trade are used; a composite distress measure and the minimum price that the participant is willing to accept in exchange for the possession. In addition, data are analyzed to explore relationships between willingness to sell, the four defined characteristics of the possession and participant's characteristics including age, gender, education and income. The possession's source and the buyer's identity dominate effects over the possession's value and uniqueness. The strength of the effects varies significantly depending on how distress is measured and between identifiable population groups.

1. Introduction

The type of relationship from which a possession is acquired can affect people's willingness to trade. This has implications for the price that might be attached to a possession and the degree of distress caused by the prospect of a sale (McGraw, Tetlock and Kristel 2003; McGraw and Tetlock 2005).

In this study we further investigate the effects of selling possessions from sources that symbolize different types of social relationships. By developing a factorial survey design, we are able to compare the effects of relational source with other possible influences on the decision to sell, including the possession's approximate market value, its uniqueness and the relationship between buyer and seller. We also explore links between individual characteristics such as age, sex, education and income and the price and distress associated with a selling decision. Our study suggests that the relational source of a possession has significant effects on selling decisions and that this effect is larger than the effect of other variables included in selling scenarios. We also find that

there are some differences in this effect according to the age and sex of survey participants.

2. Background and approach

Previous work on mental accounting has demonstrated that people attach different symbolic meanings to money and assets derived from different sources (Ashby and Burgoyne, 2009; Burgoyne, 1995; Cherry, 2001; Pahl, 1989, 1995; Thaler, 1990; Winnett and Lewis, 1995). McGraw, Tetlock and Kristel (2003) extended previous work on both mental accounting and fungibility by considering contexts in which people consider selling possessions gained from different types of relationships. Their contribution was based on the insights that (i) possessions can derive from different types of social relationships and (ii) the relational source of a possession can have important implications for decisions to sell.

Based on Fiske's relational schema (Fiske, 1991, 1992) McGraw, Tetlock and Kristel (2003) defined four types of relationship from which possessions might be acquired: communal sharing; authority ranking; equality matching; and market pricing. They demonstrated that the relational source of possessions affected the monetary value owners were willing to accept when faced with a decision to trade. In a later study, McGraw and Tetlock (2005) designed experiments to investigate the degree of distress experienced in proposed trades. They found that some trades, particularly those involving possessions acquired from "communal sharing" relationships, such as close friends, are considered to be both distressing and "taboo". The two sets of experiments provide insights into the limits of fungibility, the role of norms in defining the appropriateness of potential trades, pricing distortions in a context of emotional attachment and the distress associated with particular forms of transaction.

A further contribution of these studies was the use of scenario experiments as a method of examining potentially key features of a decision context. This was an especially valuable contribution because some specific factors, such as relational issues, cannot readily be accommodated in the laboratory trading experiments often used to investigate decision making.

Despite the significance of the findings, however, it is not clear from these studies whether the effects of relational source on decision making are sufficiently large to outweigh other potential aspects of particular decision-making contexts. For example, is “the norm activated by a relationship the same when the exchange offer is a pen valued at \$50 versus a house valued at \$1 million?” (Johar, 2005). In a similar vein, is an individual’s willingness to trade influenced by the absence or presence of other items from the same relational source (Chapman, 1998)? To this we add a further consideration. Are decisions affected differently if participants are asked to consider selling the item to a friend?

In this study we build on the scenario experiment method and discussion of relational source by combining each of the above questions into a factorial survey design. Factorial surveys allow for a number of independent variables to be included in one integrated data collection and analysis project and have been constructively employed in the social sciences for some decades. Despite their advantages for comparing the effects and interactions of variables (Cahan, 1996), they appear to remain under utilized in business and economic research (Wallander, 2009). Extending Cahan’s arguments, we propose the following five advantages to adopting a factorial survey method for this study.

Firstly, the factorial survey design allows the ranking of specific variables within purposefully designed decision scenarios. This effectively allows us to combine the investigation of four different variables within one study rather than investigating each variable separately. In this study, a factorial survey design allows us to investigate the statistical significance of four variables and then examine whether the relational source of a good has a greater effect on the measured distress or pricing than its value, uniqueness or the seller’s relationship with the buyer.

Secondly, interaction effects between variables can be investigated to determine whether the influence of one factor depends on the value of another factor. For example, we can consider whether the distress and pricing associated with selling a possession given by a friend are the same for items with a relatively low or high monetary value. This also improves generalizability of conclusions because effects of one independent

variable are estimated for many combinations of other independent variables without any multicollinearity issues.

Thirdly, factorial surveys allow for the comparison of data collected in response to different scenarios, while at the same time holding constant any potential incentive effects that may arise through data collection. If any incentive effects arise, we expect that they are similar across all survey participants and that differences in findings between contrasting scenarios can be attributed to the characteristics of variables specified in different scenarios.

Fourthly, the factorial survey design allows us to consider decision scenarios that are difficult to integrate into an experimental design. In the case of this particular study, this allows us to consider relatively expensive goods from varying relational sources and scenarios with different relationships between traders. These are issues rarely considered in laboratory experiments that involve the trading of relatively cheap homogenous goods.

Finally, a factorial survey design provides an alternative and more convenient method that can be applied to a wide range of potential variables and any population, thereby reducing difficulties extrapolating conclusions from one population to another. This assists with facilitating data collection from diverse community groups rather than relying on relatively accessible participants such as student groups.

A key difference between the factorial survey design used in this study and many previous decisions of pricing studies relates to a lack of incentive compatibility in the survey design. It can be argued that this means that there are no real consequences for participants as a result of the decisions they describe in their survey responsesⁱ. While acknowledging this limitation, the interest in this study lies in comparing results between scenarios rather than in the specific prices given. Any bias resulting from a lack of incentive compatibility can be expected to cancel out across scenarios. As noted above, the scenarios also provide a capacity to consider items with a higher value than those such as coffee mugs, pens, chocolates and small monetary sums that are generally used in studies with incentive compatibility. High value trades are a difficult variable to include in experimental environments and scenarios within a factorial survey offer an innovative approach to considering their effect on pricing decisions.

3. Research aims and design

In this study we ask survey participants to consider a scenario about selling an antique watch and ask them to identify the minimum price they are willing to accept (WTA price) for the watch and to answer questions designed to measure the distress associated with their decision. We use McGraw Tetlock and Kristel's (2005) composite distress measure as the dependent variables that compare the resistance to sell possessions from contrasting relational sources. The aim of our study is to compare the effects of relational source (S) with those of monetary value (V), uniqueness, defined in terms of the existence of a duplicate good from the same source (D) and the seller's relationship with a potential buyer (B).

We also explore whether findings differ for participants with different characteristics (gender, income, age, and education). This has been done for two reasons. Firstly, it is possible that these characteristics may moderate the above effects. Previous explorations of WTA and WTP has unexpectedly found gender to have a significant influence on the measured endowment effect (Jefferson and Taplin 2011) and the WTA data in this study provided a further opportunity to explore such links between individual characteristics and decisions. Secondly, previous studies have collected data from survey participants that are likely to be similar in terms of age and education, such as students participating in a particular university course. In this study we were motivated to include a capacity to explore the potential implications of socio-economic variables on measured WTA price and distress. Both of these aims were facilitated by recruiting participants from a range of community groups, as described below. This provides a point of contrast with previous studies that collect data from relatively homogenous populations. Identifiable differences in the responses from participants with varying characteristics have implications for the capacity to make generalizations from the findings in experimental studies.

In order to allow comparisons between the significance of four independent variables we developed a 2^4 factorial survey design as the basis for the scenarios. For the purposes of this survey, the asset was defined as a "nice antique watch". This asset was chosen as plausibly representing a possession that could vary considerably in value and source; the word 'nice' was used to imply that survey participants could reasonably

assume that they liked the watch and would not wish to dispose of it instantly. We now motivate the four factors that may affect people's willingness to trade and then describe the 16 survey scenarios.

Relational source (S). We use two strongly contrasting relational sources: a raffle prize and a gift from someone very close. The raffle prize is similar to a relatively impersonal 'market pricing' relationship while the gift from someone close has more in common with a communal sharing relationship (McGraw, Tetlock and Kristel, 2003; McGraw and Tetlock, 2005). These particular sources were chosen so that all survey participants, regardless of relational source, could assume they had not paid for the watch and initial costs need not be recovered (Strahilevitz and Loewenstein, 1998).

Approximate Value (V). In order to achieve incentive compatibility, experimental methods in studies of buying and selling often use readily accessible, relatively low value items such as coffee mugs and chocolate bars. A factorial survey design allows us to examine selling decisions concerning more valuable items. In this study we used two contrasting values for the watch: A\$100 and A\$10,000. In August 2008, pre-tax average weekly ordinary time earnings for adults working full-time in Australia were approximately A\$1,145 (Australian Bureau of Statistics, 2008). Thus a A\$100 purchase might be considered a relatively low value item, although at almost nine percent of weekly earnings it is non-trivial. In comparison, a A\$10,000 item has substantial value relative to most incomes.

Duplicate (D). In half of the scenarios the antique watch represented the only asset that had been acquired from the specified relational source. In the other half, survey participants were told they had acquired both an antique watch and some jewelry from the same source. The addition of some jewelry allowed the construction of scenarios in which participants could choose to sell their watch but retain another item, the jewelry, with similar symbolic meaning in terms of its relational source. Thus the duplicate could moderate other effects such as those due to the relational source of the watch.

Buyer (B). As noted above, market transactions involve at least two agents: a seller and a buyer and this introduces a second possible relationship into the decision making context. One of the aims of this study is to consider whether the relational source of the watch has a greater effect on selling decisions than the relationship between seller

and buyer. To investigate this issue, half of the scenarios specified that a friend wished to buy the watch, while half nominated a jeweler as the potential buyer.

Scenarios. Our scenarios therefore consisted of 16 different survey designs. Participants were provided with one randomly selected scenario based on combinations of one of each pair of phrases within the square brackets:

[Someone very close to you gave you/ As a prize in a raffle you won]

[a nice antique watch / a nice antique watch and some jewelry].

Similar watches are worth about [\$100 / \$10,000].

A [friend / jeweler] is interested in buying the watch from you.

Measures. Participants were asked for the minimum price they were willing to accept (\$) and how they would *feel* about selling the watch using five distress items: (a) I would reject the idea as completely inappropriate, (b) I would be happy to sell the watch at the right price, (c) I would find the request strange or out of the ordinary, (d) I would be insulted by the offer to buy the watch, and (e) I would find it difficult to sell the watch at the right price.

Pilot testing with a group of twelve participants revealed that some people found it difficult to give a dollar value to the WTA price question. As a result, some participants left the space blank while others wrote “no sale” or “nil” or even “0” to the request for a WTA price because they did not want to sell the watch. This suggested we required some method of distinguishing between participants willing to part with the watch, even for no monetary compensation, and those who did not wish to consider parting with the watch. We therefore included an additional item: (f) I would refuse to sell the watch at *any* price. This item was not intended to measure distress but was included to assist with interpreting responses to the WTA price question. Responses to questions (a) to (f) were measured on a seven point scale from Disagree (-3) to Agree (3).

Participants who agreed in the strongest way possible with item (f) but did not provide a numerical dollar value were inferred to have an infinite WTA price. Written comments were examined separately by each author to infer a WTA price. In most cases the intention of the participant was clear from phrases such as “no sale”. When both authors agreed, infinite values were inserted. In the few cases of ambiguity, a final decision was made after discussion.

We do not use the term infinite in its strict mathematical sense here but to indicate a very large value: so high that participants could not comfortably write such a value. We discuss this issue further and describe how an “infinite” code can be converted into a transformed price. This transformation overcomes the difficulties posed for average WTA values when survey participants responded with either extremely high selling prices or zero.

4. Data collection

In order to obtain a diverse range of survey responses, written invitations were extended to a range of community organizations based in Perth, the capital city of Western Australia. Funding was provided by Curtin University to allow the researchers to pay community groups a donation of A\$10 per completed survey in return for organizing survey participation by their members at a time and place of their choosing. Participation was forthcoming from the parents and teachers at three primary schools, the members of two book clubs, a soroptimist club, a lawn bowling club and a rowing club. The authors attended each community group’s chosen event and administered a three page survey document that took approximately ten minutes to complete. Participants each completed only one survey document. The survey document contained questions relevant to three separate issues: selling, buying and retirement policies. This article discusses data relevant to the selling section of the survey.

In order to analyze whether demographic and other variations among survey participants were a significant factor, participants were asked questions about their gender, income (in ranges specified in table 1), age (in ranges specified in table 1) and education (coded as university educated or school educated). We analyzed responses from the 378 participants who answered all five of the distress measures included in the survey and these data form the basis of the results presented below.

5. Results – Statistical Analysis

The inclusion of two dependent variables, pricing and distress, together with the large number of variables and combinations of variables generated by the factorial survey design mean that our analysis and presentation of results is divided into two sections. In

the first part of our analysis, presented immediately below, we focus on the statistical results and identify the results that have a relatively high level of significance. This allows us to focus our discussion on the economic significance of specific findings in the following section.

Of the 378 responses analyzed, 236 were from participants with a university education, while 126 had school education (16 missing values). 248 participants were women, 117 men (13 missing). Data relevant to age and income are presented in table 1.

Insert table 1

Demographics of participants were mildly correlated. Participants with a university education were more likely to be younger ($r = 0.36$) and have a higher income ($r = 0.24$) while male participants tended to have higher incomes ($r = 0.36$) and be slightly older ($r = 0.18$). All other correlations between independent variables are less than 0.15 in magnitude. Due to the random assignment of scenarios to participants the values of the scenario factors (relational source, value, duplicate and buyer) are all approximately equally frequent and uncorrelated with each other and with all demographic variables.

The first step in our analysis compared the relationship between measured distress and relational source and to compare the findings with those in McGraw and Tetlock (2005) (from hereafter referred to as MT). Intercorrelations of the five distress measures ranged from 0.35 to 0.66 ($M = 0.49$), slightly higher than those in MT (0.30 to 0.65, $M = 0.44$). Cronbach's alpha was also slightly higher than MT (0.82 versus 0.79).

The average of the five items (item b was reverse scored), referred to as the composite distress measure, was significantly related to relational source ($F(1,376) = 146.3, p < .001, R^2 = 0.28$). Participants reported significantly higher distress when the relational source of the watch was a close friend ($M = 0.8, SE = 0.075, N = 190$) than a raffle prize ($M = -1.0, SE = 0.075, N = 188$). McGraw and Tetlock (2005) reported the same difference in means of 1.8, but slightly higher mean distress, for their communal sharing and market pricing relational source for the watch. Our F and R^2 values are, as

expected, higher than those in MT because they had four relational sources while we used only the two most divergent categories.

Our study largely replicated the relationship between relational source of the watch and the level of distress found by MT. This finding holds even though our participants are from a different country, represent a broader cross-section of society than university students, and were presented with different scenarios.

5.1 Comparing composite distress measures

The factorial design of the survey allows for the significance of relational source to be compared with other factors (value, duplicate and buyer) that might be relevant to the level of distress reported by participants. Table 2 shows the ANOVA table from a full factorial model with the composite distress measure as the dependent variable. Analysis showed education levels to be a significant variable and therefore this is also included in table 2. Since 16 of the 378 participants did not provide their level of education, 362 survey responses are analyzed in this section of the discussion. Due to the experimental design and randomization of surveys to participants these independent variables are insignificantly correlated ($|r| < 0.1$).

As mentioned above, the most significant predictor of reported distress is relational source however this effect depends on the education of the participant ($p < .001$). The other relationship between seller and buyer, is also shown to be a highly significant predictor of measured distress ($p = .001$). Distress is estimated to be 0.5 ($SE = 0.15$) higher when the buyer of the watch is a friend rather than a jeweler, and there is insignificant evidence that this effect is influenced by other variables.

Insert table 2

The source by education interaction effect is summarized in table 3, which contains the estimated mean distress when the buyer is a jeweler (when the buyer is a friend mean distresses are all higher by 0.5 but the differences remain unchanged). Differences in the table highlight the extra distress when selling a watch that was a gift from someone very close (bottom row) and the extra distress displayed by university

educated participants (last column). The effect of relational source of the watch for university educated participants of 2.4 ($SE = 0.19$) is significantly higher than the effect of the relational source for school educated participants of 0.9 ($SE = 0.28$). Compared to school educated participants, university educated participants show significantly higher measured distress when selling a watch received from a friend (0.5, $SE = 0.22$) and significantly lower measured distress when selling a raffle prize (-0.9, $SE = 0.22$). Although there is some evidence that this source by education interaction depends on the value of the watch ($p = .034$) this effect is small relative to the source by education interaction described above.

Insert table 3

The moderating effect of education on the relational source effect is not only statistically significant but large in absolute terms. We estimate that the effect of the relational source of the watch is approximately 2.7 ($=2.4/0.9$) times higher among people with a university education than people with a school education. The relational source of the watch is clearly a more important determinant of distress than the buyer's identity for participants with a university degree. In contrast, for participants' with a school education, the magnitude of the relational source of the watch (0.9, $SE = 0.28$) is not significantly higher than the effect of buyer's identity (0.5, $SE = 0.15$).

We thoroughly investigated but found no evidence that the lower relational source effect among people with a school education was linked with less reliable responses.¹ However, our results suggest the effect of relational source depends heavily on education and this might have implications for the external validity of results obtained by samples

¹ Firstly, although the residuals from the dominant model have a slightly higher standard deviation for participants with a school education ($SD = 1.00$) compared to university educated participants ($SD = 0.90$), this difference is not statistically significant ($p = .084$, Levene's test). Secondly, the standard deviation of the five distress items was calculated for each participant as a measure of the internal consistency of their responses. Although participants with a school education had (on average) a higher standard deviation for their five responses ($M = 1.33$) compared to the university educated participants ($M = 1.02$), these were not significantly different ($t=1.49$, $p = .138$). Finally, we performed ANOVA after removing the 70 participants whose internal consistency standard deviation was greater than 2.5 to find education is still a significant moderator of the effect of the relational source of the watch ($p < .001$), with these effects both increasing slightly (from 2.4 to 2.6 for university educated participants and from 0.9 to 1.2 for school educated participants).

from relatively homogenous populations, such as students, that are of very similar educational background. We return to the potential economic significance of education in studies of decision to sell in our discussion section.

5.2 Comparing WTA prices

In comparison with responses to distress items, participants found it difficult to indicate a minimum price at which they would be willing to sell their watch; 105 of the 378 participants did not provide a numerical answer to the minimum selling price question. These responses were very consistent with McGraw and Tetlock's (2005) finding that transactions which violate particular social norms are considered inappropriate or "taboo". However, in some cases a value could be inferred from textual responses. We had 319 responses after we inferred an infinite value from comments written in text next to the request for a dollar value. Some examples of such comments include: "not at any price"; "would not sell"; "peevd"; "N/A would not sell regardless of price". One participant wrote "Infinity, I would not sell it all". A further 22 participants did not give a value or comment but selected the strongest response possible to item (*f*) "I would refuse to sell the watch at *any* price" and these participants were inferred to have infinity as their WTA price. We also changed 15 "0" answers to infinity in cases where they had also selected the strongest response to item (*f*). As a result of these changes we had 341 WTA prices.

In this study, there was a potential for survey participants to anchor their WTA prices to the approximate market values specified in the scenarios presented to them. Table 4 provides summary statistics for WTA prices divided by the market value of the watch (\$100 or \$10,000).

Insert table 4

Due the presence of very high or infinite prices, we calculate transformed prices (TP) defined as the ratio of WTA price to market value when this ratio is less than or equal to 1, and as 2 minus the reciprocal of the ratio when the ratio is larger than 1.

The transformed price has several desirable properties. It is on a scale from 0 (no value) to 2 (infinite value), with a midpoint of 1 (market value) and it interprets multiplicative deviations from market value in a similar way if the deviation is above or below market value. For example, values of half or double market value have a transformed price of 0.5 and 1.5 respectively, equally distant from the midpoint of 1. Values one tenth or ten times market value have a transformed price of 0.1 and 0.9 respectively. On this scale, transformed prices of 1.99 and 1.9999 are considered close to each other and to 2 (transformed price when the WTA price is infinity) even though the ratio of WTA price to market value are 100 and 10,000 respectively. This is realistic because in both cases the participant is indicating that they do not want to sell and are pricing the watch accordingly. Finally, transformed prices equal the ratio of selling price to market value when this ratio is at most 1. Since this is the case for the majority of the data this assists with interpreting the transformed price scale.

Figure 1 shows the proportion of participants (vertical axis) with transformed prices less than or equal to possible values (horizontal axis). Transformed prices tend to be higher when the watch is received from someone very close (solid line) than when the watch is a raffle prize (dashed line). In particular, 96% of participants receiving the watch as a raffle prize gave values less than infinity compared with 58% of the participants receiving the watch from someone very close. When finite values are provided, the market price or half the market price (presumably a discount to the market value to ensure sale of a second-hand asset) are frequent values.

Insert figure 1

5.3 Comparing sources of variation in transformed prices

Table 5 shows the ANOVA table from a full factorial model with the transformed price as the dependent variable. We exclude education of the participants from this table as education and all interactions involving education are not statistically significant. The most significant predictors of TP are relational source of the watch (S, $p < .001$), buyer identity (B, $p = .001$) and market value (V, $p = .001$). Whether the duplicate good was

also received (D , $p = .061$) was almost significant however this moderates the effect of the buyer identity ($D \times B$, $p = .038$).

Insert table 5

The source of the watch is clearly the dominant influence: TP is 0.61 ($SE = 0.06$) higher when the watch is received from someone very close rather than as a prize in a raffle. Mean transformed prices are 1.38 and 0.77 for these relational sources of the watch, corresponding to prices that are about 160% and 77% of the market value of the watch.

Additional analysis, which for purposes of brevity is not contained in separate tables, provides some further insights. Transformed price is 0.20 ($SE = 0.06$) lower when the value of the watch is \$10,000 rather than \$100 and so, relative to the market value of the watch, participants are willing to accept lower relative prices for the more expensive watch. For example, 56% (89/159) of the participants with the \$10,000 watch would accept the market value of the watch but only 38% (70/182) of the participants with the \$100 watch would do so.

The results suggest that the effect of relational source on the WTA price of the watch does not depend on the value of the watch. That is, people do not appear to place more sentimental value on the watch according to its market value; in statistical terms, $S \times V$ is not significant ($p = .330$).

Although measured distress is lower when the potential buyer of the watch is a jeweler rather than a friend, the transformed price is 0.21 ($SE = 0.06$) higher. This is a reversal of the relationship between distress and price for relational source and indicates that participants were prepared to give a discount to a friend and/or require a higher price from the relatively unknown jeweler. There is some evidence this effect is moderated by whether duplicate jewelry was received with the watch ($p = .038$: $D \times B$ in table 6). When jewelry is received together with the watch, TP is 0.33 ($SE = 0.08$) higher when the buyer is a jeweler but when no additional jewelry is received this difference is only 0.08 ($SE = 0.08$) and not statistically significant. The possible causation behind this relationship is not intuitive. One might expect that the existence of a second item from a similar source

might increase the preparedness of the owner to sell the watch; however the data do not support this proposition. Possible interpretations might link with the idea that the owner of the watch and jewelry see the items as a 'set', or as complementary goods, and they are therefore reluctant to part with only one item.

The age of the participant significantly moderates the effect of the relational source of the watch on transformed price ($p = .008$, $N = 339$ as two participants did not give their age). When the watch was a raffle prize there was an insignificant relationship between the TP and the age of the respondent ($p = .189$). In contrast, when the watch was received from someone very close, TP decreases significantly ($p = .013$) with the age of the participant. The effect of the relational source of the watch decreases from 0.83 for participants 26-35 years of age to 0.36 for participants 66-75 years of age. Furthermore, this effect differed significantly with gender: for men significantly ($p = .004$) from 0.85 to 0.04; for women insignificantly ($p = .806$) from 0.75 to 0.69. Thus our results suggest that the effect of the relational source of the watch on TP is similar for young men and women, is resilient among older women but disappears in older men.

Finally, we note that income and education do not significantly moderate the effect of the relational source of the watch if these variables are used in place of age ($p = .406$, $p = .112$), and if included with age the moderating effect of age remains strong ($p = .013$ and $p = .052$). Hence despite the correlation between these variables it appears age rather than income or education explains the magnitude of the effect on TP from the relational source of the watch.

6. Results – Economic Significance

The scenario experiments that form the basis of this study were designed to compare the effects of four key factors on participants' willingness to sell; relational source, value, uniqueness and buyer identity. Willingness to sell, that is to convert an asset to cash, was inferred by measured distress and an analysis of WTA prices. The design of the survey and the large number of possible combinations of variables means that the above discussion has focused on statistically significant results. We now turn to the economic and theoretical significance of the findings.

The results were consistent with the hypothesis that there are differences in the reluctance to sell assets from different relational sources. Measured distress and selling prices were significantly higher when participants considered the offer to buy a watch received from someone very close compared with a raffle prize. Consistent with McGraw Tetlock and Kristel (2003) and McGraw and Tetlock (2005) we infer that people draw a sharp distinction between the different relationships from which they might derive possessions and this has measureable effects on their willingness to sell.

In addition to relational source, our study compared results for two contrasting buyers: a friend and a jeweler. In this case a closer relationship with the buyer increased composite distress scores but decreased the WTA price. That is, despite finding the ‘buyer friend’ scenario relatively more distressing, participants did not record higher WTA prices. This scenario appeared to invoke a norm about extending generosity to friends, even in a potentially distressing scenario.

Among the four independent variables that were integrated into the scenario experiments, relational source was the dominant predictor of both measured distress and WTA prices. In the context of our study we conclude that the market values for the watch made little difference to the distress measured among the survey participants; similar distress levels were reported whether the watch was worth approximately \$100 or \$10,000. However, data relevant to selling prices raise some interesting issues. The value of the item had a significant effect on the selling prices given by participants but not their measured distress.

Measured distress varied significantly according to education. University educated participants recorded higher levels of distress than school educated participants when presented with scenarios involving watches received from someone very close. As discussed in our results, this disparity does not appear to be related to differences in the two groups’ capacity to complete the survey document. We suggest that in the Australian context, different levels of education may be a more accurate indicator of a participant’s life time and/or household income than that indicated by the “current income” item included in the survey document (Preston, 2001). Further, questions about current income do not necessarily generate insights into a participant’s wealth. Education’s close correlation with both lifetime income and wealth may indicate a relationship between

reluctance to sell and access to economic resources; those with greater access to resources have an increased capacity to choose whether to sell (Headey, Marks, and Wooden, 2005). Participants with lower lifetime income and wealth might not like selling a possession but have a greater need to do so. There is a need for further investigation of this proposition using more finely developed measures of income and wealth.

In contrast, no difference in the relationship between relational source and selling price was found between participants with different educational levels. While university educated participants might have recorded higher measured distress when asked to consider selling a watch from someone close this did not lead to significant differences in WTA prices. This suggests that the distress items capture issues relevant to a participant's willingness to sell that are not captured by dollar values alone.

For watches from different relational sources there was also a marked difference in selling prices by age and gender. The effect of relational source on selling price was similar for young men and women of all ages. Among older men there was little evidence that prices depend on the relational source of the watch. The different effects among older men and women raise some interesting sources of speculation and questions for further investigation. Australian women aged 45 and over are more likely than men to have retired from the workforce, and perhaps more importantly, to rely on income transfers from a partner as their main source of income at retirement. In 2006-07 there were approximately 805,000 women aged 45 years and over who relied on their partner's income at retirement compared with 49,000 men (Australian Bureau of Statistics 2008, 23). Women in middle and later life may be more accustomed to receiving and relying on income and possessions in the form of gifts or 'communal sharing' arrangements. One hypothesis might be that different norms are activated among different groups and that this might relate to patterns and sources of income and wealth.

In more general terms, our results differ in measurable ways for specific groups of participants. This has implications for the extent to which survey and experimental findings from relatively homogenous populations, such as some groups of college students, can be assumed to be common to other populations. Questions of parallelism or external validity are an important consideration in the methodological basis of experimental economics (Siakantari, 2000; Guala, 2002). Our results suggest that

experiments carried out almost exclusively among college students, particularly among cohorts who represent a relatively narrow range of educational qualification and ages may neglect socialization and institutional factors relevant to the external validity of specific findings.

7. Conclusions and future directions

Our key results can be summarized as follows. Firstly, relational source had a significant effect on participants' willingness to sell with both the composite distress measure and selling price higher when selling a watch received from someone close. This effect dominated any measurable effects of value, uniqueness and buyer relationship. Secondly, the participant's specified relationship with the potential buyer of the watch had a significant effect on both measured distress and selling prices, but in different directions. Participants displayed higher distress when selling to a friend rather than a jeweler but were willing to accept lower prices. Thirdly, contrasting watch values had no significant effect on measured distress although selling prices were significantly discounted compared to market price for the more expensive watch. Fourthly, the existence of a duplicate good, in the form of jewelry from the same relational source had little effect and might be considered relatively unimportant in the context of this study. Finally, there were identifiable and significant differences in some of the effects for different population groups.

Findings from this study are consistent with previous results demonstrating the significance of relational source for measured distress and pricing decisions (McGraw, Tetlock and Kristel 2003, McGraw and Tetlock 2005). There are, however, important differences in the methods used that have implications for future research in this area. Our use of scenario experiments in which each variable is specified, places participants in relatively contrived hypothetical situations but allows for the control of key variables such as the value of the item under consideration. This allows for the significance of relational source to be compared with other key variables such as the presence of duplicates and buyer identity. Our results are consistent with the proposition that relational source has effects that dominate other important features of a decision context such as value, uniqueness and buyer.

Our purposefully diverse participant population generated results that indicate measurable differences in responses from different population groups. Specifically, selling prices nominated by older men were less affected by relational source than those given by younger men and women. Analysis of education levels produced findings relevant to measured distress, with university educated participants recording higher differences in composite distress score depending on the relational source of the watch.

Taken together, our results suggest that method, survey design and population each pose significant implications for findings about the links between relational source, decisions to sell and mental accounting. There appears to be ample scope for further replication and detailed research to contribute further to this discussion. The results also suggest a capacity for greater understanding of the links between social and economic relationships and their effects on both pricing decisions and the distress caused by particular transactions. This study suggests that focusing that pricing decisions can be underpinned by differing levels of distress for apparently superficially similar transactions.

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TABLES

Table 1: Age and Income Frequencies for Survey Participants (n=378)

Age (years):	Frequency	Income	Frequency
18 - 25	3	no income	21
26 - 35	34	Less than \$20,000	72
36 - 45	135	\$20,001 - \$35,000	50
46 - 55	87	\$35,001 - \$45,000	34
56 - 65	47	\$45,001 - \$60,000	34
66 - 75	60	\$60,001 - \$80,000	49
75+	9	more than \$80,000	80
missing	3	missing	38

Table 2: ANOVA Table for the Full Factorial Model Predicting Distress

Source of distress	SS	df	MS	F	<i>p</i>	
S	193.39	1	193.39	95.47	.000	***
D	2.12	1	2.12	1.04	.308	
V	1.98	1	1.98	0.98	.323	
B	24.07	1	24.07	11.88	.001	***
E	2.62	1	2.62	1.29	.256	
S x D	3.25	1	3.25	1.61	.206	
S x V	0.87	1	0.87	0.43	.514	
S x B	0.10	1	0.10	0.05	.828	
S x E	41.04	1	41.04	20.26	.000	***
D x V	0.76	1	0.76	0.37	.542	
D x B	0.30	1	0.30	0.15	.700	
D x E	4.18	1	4.18	2.06	.152	
V x B	0.11	1	0.11	0.05	.817	
V x E	0.32	1	0.32	0.16	.693	
B x E	3.52	1	3.52	1.74	.188	
S x D x V	0.30	1	0.30	0.15	.701	
S x D x B	1.87	1	1.87	0.93	.337	
S x D x E	1.22	1	1.22	0.60	.439	
S x V x B	6.45	1	6.45	3.19	.075	
S x V x E	9.18	1	9.18	4.53	.034	*
S x B x E	0.07	1	0.07	0.03	.857	
D x V x B	1.46	1	1.46	0.72	.396	
D x V x E	0.28	1	0.28	0.14	.711	
D x B x E	4.69	1	4.69	2.32	.129	
V x B x E	0.64	1	0.64	0.32	.574	
S x D x V x B	6.59	1	6.59	3.25	.072	
S x D x V x E	0.07	1	0.07	0.03	.857	
S x D x B x E	0.13	1	0.13	0.07	.798	
S x V x B x E	0.20	1	0.20	0.10	.755	

D x V x B x E	1.42	1	1.42	0.70	.404
S x D x V x B x E	1.18	1	1.18	0.58	.446
Error	668.47	330	2.03		

R-squared = 0.39 (adjusted R-squared = 0.33) *, **, *** indicate $p < .05$, $p < .01$ and $p < .001$ respectively. Note: 'S' stands for the relational source of the watch; 'D' for duplicates; 'B' for buyer relationship; 'V' for the approximate value of the watch; and 'E' for education.

Table 3: Estimated Mean Distress by Relational Source and Education with Jeweler
Buyer

	University education	School education	Difference
Source – Close	0.8	0.3	0.5
Source - Raffle	-1.5	-0.6	-0.9
Difference	2.4	0.9	1.5

Table 4: Percentiles of the Ratio of WTA Price to Watch's Approximate Market Value

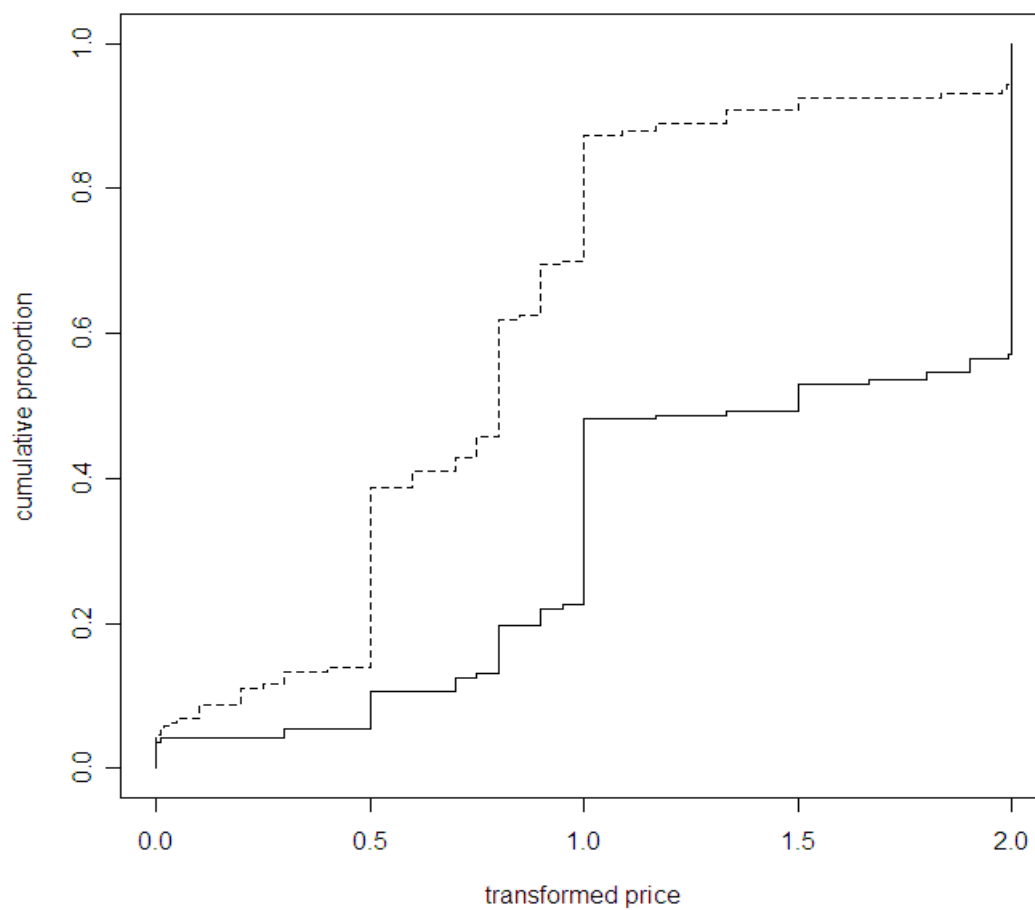
	<i>N</i>	Min.	25th %	Median	75th %	Max.
Source - close	168	0	1.0	2.0	Infinity	Infinity
Source - raffle	173	0	0.5	0.8	1.0	Infinity

Table 5: ANOVA Table for the Full Factorial Model Predicting Transformed Price

Source	SS	df	MS	F	<i>p</i>
S	31.40	1	31.40	112.02	.000 ***
D	0.99	1	0.99	3.52	.061
V	3.05	1	3.05	10.89	.001 **
B	3.13	1	3.13	11.17	.001 ***
S x D	0.01	1	0.01	0.03	.869
S x V	0.27	1	0.27	0.95	.330
S x B	0.00	1	0.00	0.00	.961
D x V	0.62	1	0.62	2.23	.137
D x B	1.21	1	1.21	4.32	.038 *
V x B	0.58	1	0.58	2.06	.152
S x D x V	0.64	1	0.64	2.28	.132
S x D x B	0.45	1	0.45	1.62	.204
S x V x B	0.08	1	0.08	0.27	.603
D x V x B	0.00	1	0.00	0.01	.934
S x D x V x B	0.16	1	0.16	0.56	.455
Error	91.09	325	0.28		

R-squared = 0.32 (adjusted R-squared = 0.29). *, **, *** indicate $p < .05$, $p < 0.01$ and $p < 0.001$ respectively. Note: 'S' stands for the relational source of the watch; 'D' for duplicates; 'B' for buyer relationship; 'V' for the approximate value of the watch; and 'E' for education.

Figure 1: Cumulative Distribution Function of Selling to Market Value



Relational source - Close (solid line), relational source - Raffle (broken line)

ⁱ We are indebted to an anonymous reviewer for this important argument..