“DISPOSAL OR DONATION? UNDERSTANDING CONSUMER DISPOSAL CHOICES FOR USED GOODS”

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ABSTRACT

Reverse supply chains rely on used goods to be returned by consumers to disposal points. Very little operations management research however has explored consumer preferences during this process. We identify two main disposal profiles that depend on a consumer’s: a. attachment to their possession, and b. their desire to give.
INTRODUCTION

We expect consumers to buy new products and as scholars, invest significant effort toward the why and how of this. We spend almost no time however, exploring what consumers do with their possessions once they no longer hold utility for them. A consumer’s possessions at the end of their use are a potentially valuable commodity but also difficult to economically collect from consumers (Kang and Schoenung, 2006; Gregory and Kirchain, 2008; Atasu, Toktay and Van Wassenhove, 2013). The dominant assumption of the operations management literature is that consumers are a rational and economically motivated actor in the reverse supply chain (Plambeck and Wang, 2009). The consumers’ role in the reverse supply chain is to ‘dispose’ of their possessions at an ideal time and place so that collection efficiency and volume are optimized (Ovchinnikov, 2011). Consumers are in fact quite reluctant to relinquish their possessions in a timely fashion (Lastovicka and Fernandez, 2005). As we describe, the relationship between a consumer and their possessions will significantly impact a consumer’s disposal choices as to how and when they dispose of a used good. This will impact the volume, timing and condition of goods entering the reverse supply chain.

The complexity of the disposal decision for individuals is highly relevant to the study of reverse supply chains. Yet it is an area of research that has attracted surprisingly little attention. While consumers have been partly considered in forecasts of product returns, packaging system design, or take-back policies (Toktay, 2004; Plambeck and Wang, 2009; Ovchinnikov, 2011), their decisions leading up to and including disposal have rarely been explored. In decentralized and uncoordinated reverse supply chains in particular, cost structure of the collection process is a critical success factor (Atasu et al, 2013). Further, a majority of studies on the supply side of the reverse supply chain have considered factors only at the retailer-remanufacturer or remanufacturer-manufacturer level (Clottey, Benton and Srivastava, 2012).

Consumers increasingly avoid disposal by moving their used possessions into storage (Haws et al, 2012). Popular television shows such as ‘Hoarders’ illustrate more extreme instances of consumers not wanting to dispose of their possessions. At a basic level however, many consumers simply may not know how to dispose of their possessions (Saphores, Nixon, Ogunseitan and Shapiro, 2009). Others worry about how the next person or organization will use their items (Lastovicka and Fernandez, 2005; Brough and Isaac, 2012). Almost all consumers attribute meaning to their possessions over a lifetime of use (Belk, 1988). As we describe, disposal is far from a straightforward decision for many consumers.

Our paper is structured as follows. First, we describe the background to our study and existing, relevant literature. Second, we present a model that describes the disposal process faced regularly by consumers. Third, we assess our model using both the results of interviews with consumers and a large consumer survey. Fourth and finally, we present our results as well as discuss their implications and the opportunities they present for future research.
BACKGROUND

REVERSE SUPPLY CHAIN
The perspectives of the manufacturer, retailer and policy maker have dominated past studies on the reverse supply chain (Webster and Mitra, 2007). Consumers however are an important part of the reverse supply chain. Consumers are effectively a ‘supplier’ in this system and can influence volume, collection efficiency and condition of used goods (Goo, Liang, Huang, and Zu, 2008). They are an important yet poorly understood stakeholder in the reverse supply chain (Atasu, Guide and Van Wassenhove, 2008; Jacobs and Subramaniam, 2012; Atasu, Ozdemir and Van Wassenhove, 2013).

All reverse supply chains however require a steady and cost effective supply of material if they are to be economically viable (Kang and Schoenung, 2006; Gregory and Kirchain, 2008). As a result, how firms obtain the material needed to supply their reverse supply chain (e.g. product returns) is a popular topic in operations management. Scholars have explored optimal models of materials return predominantly from the perspective of the manufacturer (Clottey et al, 2012; Atasu and Van Wassenhove, 2012). ‘Customers’ are typically the retailer who will return goods on behalf of consumers. Occasionally the consumer is factored into these material return models however usually only with a small set of fixed choices (Savaskan and Van Wassenhove, 2006; Guide and Li, 2010; Ovchinnikov, 2011). These models generally assume that consumers are: a. economically motivated, and b. likely to return goods at a stable rate given the right incentive (Plambeck and Wang, 2009).

A related body of research that explores when and why consumers recycle offers some more specific insight into the role of consumers in materials return. These studies suggest that a consumer’s recycling decision is influenced predominantly by personal and demographic factors. These include the effort required to recycle, existing awareness of recycling, personal environmental goals, past recycling experience and the recycling message itself (Lord, 1994; Schultz and Oskamp, 1996; White et al, 2011; Saphores, Ogunseitan and Shapiro, 2012). A consumer’s relationship however to a possession being recycled or potentially available for recycling has not previously been addressed.

DISPOSAL OF POSSESSIONS
While scholars have spent much of the last century studying the ways in which consumers buy and consume products, very little research has explored how consumers dispose of them. Yet consumers presumably do not store a lifetime of possessions in their homes. Practically speaking, consumers have several disposal options available to them that include sale, donation, recycling, trade-in and landfill, among others. Disposal of used possessions should be a simple and commonly used process for consumers. Theories relevant to ‘disposition’ however suggest that disposal is associated with loss by many individuals (Kahneman et al, 1990; Belk, 1988; Haws et al, 2012). Consumers associate memories and emotion with their possessions and give them iconicity that increases the complexity of the disposal decision (Lastovicka and Fernandez, 2005).
A small group of researchers have recently sought to better understand the disposal decisions of consumers. Disposal theory suggests that an individual’s disposal decision is primarily influenced by: a. situational factors, b. factors intrinsic to the product, and c. psychological factors relevant to the owner of the possession (Jacoby et al, 1977; Lastovicka and Fernandez, 2005). Research in this domain focuses on a consumer’s disposal decision less from the perspective of ‘how’ (which is common in operations management), and more from a position of ‘why’. Consumers, in general, struggle with the decision to relinquish certain possessions. Difficulty letting go of possessions can be seen in parents that hold on to their children’s clothing long after they have grown up (Sego, 2010; Phillips and Sego, 2011). Or during transition periods for families such as moving parents into assisted living and bereavement (Price et al, 2000; Curasi et al, 2004; Ekerdt et al, 2012).

Collectively, studies on disposal behavior have established a link between a consumer’s bond with their possessions and subsequent patterns of possession retention and disposal. In addition, they highlight that consumers often require a moving-on process or ‘rituals’ that help them cope with possession loss from disposal (Roster, 2001; Lastovicka and Fernandez, 2005). These can include selecting buyers for personal rather than financial reasons, looking for common identity in a buyer, cleaning objects before sale, or releasing the ‘story’ of their possession to a buyer (Lastovicka and Fernandez, 2005; Ballantine and Creery, 2010; Cherrier and Rahman, 2010). Sellers of wedding dresses for example frequently seek to pass on the story of their dress as a means to extend its life or move on from a divorce (Lastovicka and Fernandez, 2005). Without such rituals or interventions, consumers are less likely to dispose if their possessions, thereby delaying and limiting rates of material supply.

**ATTACHMENT TO POSSESSIONS**

Consumers do not simply interact with their possessions as though they hold only functional value and a pre-determined date for disposal or replacement (Belk, 1988; Dommer and Swaminathan, 2013). Consumers in fact form significant bonds with their possessions and the brands that represent groups of possessions. In the case of durable goods in particular, such as automobiles, musical instruments, computers and phones, consumers engage with these possessions in ways that fulfill emotional or social deficits (Lastovicka and Sirianni, 2011). How a consumer engages with their possessions (use frequency, location, and purpose) or personal events that reflect on possession ownership (e.g. starting college or divorce) each influence the relationship between a consumer and their possession (Shih and Venkatesh, 2004; Lastovicka and Fernandez, 2005; Dommer and Swaminathan, 2013). Even the decision process used during purchase can influence this relationship (e.g. length of search, product novelty, intended use) (Bolton and Alba, 2012; Brough and Isaac, 2012).

Several very basic personal beliefs can also encourage possession-based attachment such as conservationism or frugality (Lastovicka et al, 1999). A fear of unused utility in a possession can also increase the reluctance of a consumer to dispose of it as well as impact how they dispose of it (e.g. trade-in versus donation) (Okada, 2001; Brough and Isaac, 2012). Finally, some consumers simply use their possessions to fill a perceived gap
in their life such as a lack of intimacy or belonging (Belk, 1998; Ahuvia, 2005; Lastovicka and Sirianni, 2011). The drivers and outcomes of possession attachment are both varied and complex. Possession-based attachment may encourage consumers to nurture their possessions with further purchases, but can also lead to possession retention well past an item’s functional life (Lastovicka and Sirianni, 2011). Possession-based attachment may also restrict a consumers’ desire to purchase replacement products (Okada, 2001). Many consumers are not directly aware of their attachment to a possession and will use a range of justifications to explain their ownership patterns (Haws et al, 2012). Overall, regardless of its source, attachment to possessions is a critical precursor to a consumer’s reluctance to dispose of their possessions.

**DESIRE TO GIVE, TIMING AND OTHER EFFECTS**

*Desire to give*

In addition to the processes already described, a behavior less commonly associated with disposal is that of giving one’s possessions away to those in need (donation). A desire to help others can lead to the donation of goods, labor or money to charity or others in ‘need’ (Grant et al, 2008; Gneezy, Imas, Brown and Nelson, 2012). Recycling can also be viewed as a form of morally driven behavior, particularly where consumers have an existing concern for the environment (Lord, 1994). Charitable behaviors are driven by several factors including a person’s emotional state, sense of belonging, and how the donation appeal is framed (Aquino and Reed, 2002; Lee and Shrum, 2012; White, MacDonnell and Ellard, 2012). Where an act of giving can be closely related to its benefits, such as knowing the recipient or feeling empathy for the recipient, giving motivations are increased (White et al, 2012).

The desire to give to or help others however is not equal in all people. Charitable organizations must invest substantial effort to obtain donations of funds and goods, highlighting an equal reluctance to give. Furthermore, giving behaviors can be both unconditional (altruistic) as well as conditional (reciprocal), the latter being driven by conservatism, expectations of benefits, and self-interest (Cialdini et al, 1987; Lastovicka et al, 1999; Sousa et al, 2010). Studies have shown that donation behavior is often seen as a social obligation rather than something that fulfils a person’s desire to help others (White and Peloza, 2009; Knutsson et al, 2013).

*Timing*

The disposal decision can also be influenced by factors external to the possession such as demographics, infrastructure, social norms and timing. The length of time for which a person owns a possession does not always affect possession attachment (Kahneman et al, 1990; Dommer and Swaminathan, 2013). The decision to relinquish a possession however can be influenced by the time allowed to make the decision. Where a person is asked to give up their possession immediately, their sense of loss will be experienced in the present. Rogers and Bazerman (2008) for example found that people are more willing to make decisions regarding things they ‘should’ do (rather than want to do) if they can delay the choice to the future. In addition, individuals like to delay decisions that are seen
as socially desirable but not necessarily something they want to do (e.g. recycling) (White et al, 2011).

**CONCEPTUAL MODEL**

While we know that disposal can be an emotional process for many, very little empirical analysis has sought to validate the relationship between attachment and disposal. On the one hand, attachment is likely to limit timely disposal or at least elicit a strong emotional response to the idea of disposal for some possessions (Sego, 2010). On the other hand however, consumers are better able to engage with the idea of disposal where they are able to utilize disposal rituals such as distancing, self-reference or valence change (Lastovicka and Fernandez, 2005). While attachment is proposed to limit consumers’ willingness to dispose of their possessions, a counter-intuitive mechanism such as a desire to give to others or a decision delay is proposed to intervene and change this relationship. Based on this general assumption, we provide a conceptual model as described in Figure 1 and explained in further detail below.

--- INSERT FIGURE 1 HERE ---

Initially, we propose that an underlying mechanism, attachment, forms the foundation for a consumer’s reluctance to dispose of their possessions. This emotion will limit what should be a straightforward choice between disposal channels:

*H1. Attachment to possessions has a negative relationship with all disposal choices.*

Second, we propose that a consumer’s desire to give, without regard to possession attachment, will have a positive relationship with disposal choice. Opposite to being overly attached to one’s possessions, is to not be at all concerned with giving them up. This can include being willing to donate one’s goods to other individuals, charities, commercial collectors or recyclers without an expectation of reciprocity. A desire to help and give to others is the psychological foil to a person’s love for their possessions. It may also act as a process through which an individual can help to justify the decision to relinquish their possessions.

The relationship between wanting to keep and wanting to give however, although intuitively linked, has not been explored empirically. Being able to motivate consumers’ underlying altruism in relation to possession disposal could feasibly increase the disposal rate of durable goods:

*H2. A desire to give to others has a positive relationship with all disposal choices.*

Third, we assess this basic desire to give to others relative to a potential conflict between wanting to give and wanting to keep a specific possession. While a consumer may express general charitable intentions, they may still be reluctant to donate or recycle possessions they are highly attached to. A desire to give to others could reduce the highly self-oriented nature of possession attachment and increase the likelihood of disposal.
Giving desire will reduce the negative influence of attachment on disposal choice and lead to greater rates of disposal:

**H3. The relationship between attachment to possessions and disposal choices is moderated by a desire to give to others.**

In addition, by deferring a decision to the future, a perceived loss becomes a more abstract and acceptable concept for the individual. People make decisions that better reflect their ideal, socially acceptable selves if the decision can be delayed to a point in the future (Trope and Liberman, 2000; Rogers and Bazerman, 2008). We propose that the timeframe within which a person is asked to make the decision to relinquish a possession will influence their disposal decision. Delaying the disposal decision allows an individual to feel more comfortable with loss particularly where attachment to the possession is high:

**H4. When framed as a decision in the future, attachment to possessions has a positive relationship with all disposal choices.**

Finally, in opposition to the above, a high desire to give will be negatively influenced by a decision delay. In fact, a delay in giving may present a negative outcome for more altruistic individuals:

**H5. When framed as a decision in the future, a desire to give has a negative relationship with all disposal choices.**

**STUDY METHOD**

We chose to study electronic products, particularly personal computers, because they are a valuable waste but also increasingly play a significant role in consumers’ lives. These types of possessions are seen as objects that reflect a consumer’s social status and can play a critical role in their ability to work, socialize and interact with the world (Bruner and Kumar, 2007). Consumers can love their computers in ways that represent romantic and fatuous attachment (Lastovicka and Sirianni, 2011).

**Study 1 – Interviews with consumers**

We initially sought to interview individuals who owned personal computers in order to better understand the relationship between attachment and disposal. The use of qualitative interview method is frequently used in studies of the emotional dimensions of disposal (Roster, 2001; Lastovicka and Fernandez, 2005; Lastovicka and Sirianni, 2011). A semi-structured interview method allowed us to explore the different roles that computers play in consumers’ lives as well as delve into the many dimensions of attachment. We also sought to understand consumers’ preferences for disposal of their computers both in the past and in the future.

**Study 2 – Survey**

*Data*
We developed a survey instrument using a mix of previously validated scales and our findings from the interviews. The final survey was distributed to a random sample of consumers located throughout Australia using a professional survey service that owned a national consumer database. We received completed surveys from a sample of 250 consumers with demographics as shown in table 1.

**Measures**

**Attachment**

In measuring Attachment, we sought to identify deep commitment to the selected possession. We used items from Lastovicka and Sirianni's (2011) study on possession attachment that reflected enduring commitment to a possession. A final item was drawn from Okada (2001) to assess currency of an owner’s attachment to the possession through expected future enjoyment from the possession.

**Disposal**

Disposal choices for individuals were drawn from past studies on computer disposal and aligned with available disposal options in the region of the survey population. We split disposal choice into two variables – Charitable options and Non-Charitable options. The former only non-reciprocal charitable options (e.g. donation to a family member, friend, charity, and child-in-need (after Eingar and Levontin, 2013). The latter included more commercial options likely to lead to resale, reuse or recycle (manufacturer, local government collection, recycler, and door-to-door collector) (after Babbitt et al, 2011).

**Desire to Give**

A desire to give to others, or ‘prosocial behavior’ is defined as “intentional actions to help or benefit others, such as helpful interventions, volunteer work, and donating money or blood” (Lee and Shrum, 2012:p.533). We used Grant et al’s (2008) scale for perceived prosocial identity to assess an individual’s desire to give, as also used in Gneezy et al (2012).

**Controls**

We included several control variables to ensure that main effects were not the result of standard demographic variables such as age, gender, income and past experience disposing of computers (prior disposal).

**Analysis**

Given the focus of our research on consumer behavior, we sought a sample of individual consumers across representative demographics (location, gender, profession, age, income). The use of consumers in consumer behavior studies selected in this way is routinely employed in marketing studies. Other studies addressing similar themes of product attachment and disposal used consumer samples with an n of 283 (Lastovicka and Sirianni, 2011), 390 (White et al, 2011) and 240 (Haws et al, 2012).

We used a hierarchical linear regression method with moderators as recommended by Baron and Kenny (1986) and Aguinis et al (2005). Significance was assessed using: a. significance of $R^2$; as well as b. overall ‘power’ of the moderation effect using $f^2$ (after Peng and Lai, 2012; McLelland and Judd, 1983).
RESULTS
Our initial analysis of the influence of the study control variables (age, gender, income and prior disposal), indicated a positive, significant relationship between age and attachment (**p<0.01), and gender and attachment (*p<0.05). A positive, significant relationship was also found between age and charitable disposal options (**p<0.01) and a very small effect between gender and charitable disposal options (p<0.10). None of the control variables had an effect on material disposal options. When the disposal decision was delayed (timing effect), prior disposal experience indicated a significant, positive relationship with charitable disposal options (**p<0.001), and age had a significant, positive relationship with material disposal options (**p<0.01).

Our first hypothesis, H1, was that attachment would be negatively related to all methods of disposal. The analysis indicated a negative relationship between possession attachment and both charitable disposal options and material disposal options. This relationship however was only significant between attachment and material disposal options (**p<0.001). High levels of possession attachment caused consumers to express a significant, negative response for material disposal options only. Our second hypothesis, H2, was that a desire to give would be positively related to all methods of disposal. The analysis indicated a positive relationship between a desire to give and both types of disposal option, however the relationship was only significant for charitable disposal options (**p<0.001). A high desire to give caused consumers to express a significant, positive response for charitable disposal options only. Our third hypothesis, was that the interaction effect of attachment x a desire to give would decrease the negative effect of attachment on disposal. The analysis did indicate an interaction effect whereby consumers became less positive about charitable disposal options (beta change from +ve to -ve, and a significant $r^2$ of **p<0.01) and more positive about material disposal options (beta change from –ve to +ve and a significant $r^2$ of **p<0.01).

Finally, our last two hypotheses, H4 and H5, proposed that the timing of disposal (delaying the decision), would invert the relationships described at H1 and H2. In other words, delaying the disposal decision would reduce the negative effect of attachment but would also increase the positive effect of a desire to give. The analysis indicated that, as the timing of the decision was delayed further into the future, even consumers highly attached to their possessions were positive about all disposal options (+ve beta with **p<0.01 for both charitable and material disposal options). Consumers with a high desire to give however became more negative about both disposal options as the decision was delayed further into the future (-ve beta with **p<0.01 for both charitable and material disposal options).

DISCUSSION
Our analysis confirmed the significant influence of possession-based attachment on consumer disposal choices. In particular, higher levels of attachment cause consumers to become increasingly reluctant to part with their possessions especially for material disposal options (manufacturer, recycler, kerb-side, home-based collection).
We also confirmed that high levels of giving behaviors lead consumers to willingly dispose of their possessions through charitable options (family, friend, charity). The non-significant relationship between desire to give and material disposal options seems plausible given that donation is predicated on an expectation of helping those in need, rather than more commercial interests (Grant, 2008; Lee and Shrum, 2012).

The interaction between attachment and desire to give, produced a consumer disposal strategy that appeared to resolve in some way, a consumer’s underlying concern for their possession. Where the consumers in our study were faced with a complete mental loss (high attachment, low desire to give), they selected no option for disposal. When faced with a less significant mental loss, through possession disposal but with an increasing desire to give, they chose concrete disposal options (material disposal options, table 5). In other words, “I am more comfortable with disposal than before, however I need to know where it will end up”.

Based on our analysis, we identified three main consumer disposal profiles:

1. **No disposal or donation** (high attachment, low desire to give)
2. **Predominantly donation** (low attachment, high desire to give): Give possession a “Second Life” – no concern for possession security
3. **Predominantly disposal** (high attachment, high desire to give): Give possession to “Safe Hands” – concern for possession security

**The influence of timing**
In addition to the main effects described above, we also assessed to influence of a decision delay (timing of disposal) on H1 and H2 (which then became H4 and H5). Our analysis confirmed that consumers felt more comfortable with the disposal decision where they were able to delay this decision to the distant future (greater than 6 months).

**CONCLUSIONS**
We explored the role of consumer behavior in the used good disposal decision. The why and how of used goods disposal by consumers, particularly durable products, should be an area of significant interest to operations management scholars. Both remanufacturing and recycling systems depend significantly on steady volumes of material supply entering the reverse value chain. The role of the consumer behavior in material supply has received very little attention. We found that the relationship possession-based attachment significantly limits the likelihood of consumer used computer disposal. High levels of attachment were associated with highly negative responses to all possible disposal choices. We also established that both interventions reduced this negative response and increased likelihood of disposal to: a. charitable outlets where only desire to give was high; non-charitable outlets where both attachment and desire to give were high; and all outlets where consumers could postpone the decision for more than 6 months.

In terms of contribution, we developed and tested a conceptual model explaining the critical relationship between consumer attachment to possessions and disposal choice. Almost no prior studies in operations management have addressed the role of consumer behavior in the used good disposal decision. In addition, we empirically tested a
relationship that has previously only been described in qualitative work. Finally, we described and tested the role of two psychological interventions for consumers that assist with their disposal decision and increase disposal choices overall. This extends existing theory on consumer ‘disposition’ strategies and provides potential disposal interventions for use by governments, retailers, recyclers and manufacturers.

REFERENCES


**FIGURE 1.** Conceptual model

- **Attachment to Possessions**
- **Charitable Disposal**
- **Non-charitable Disposal**

**Moderators**
1. Desire to Give
2. Timing of Disposal