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# Towards Sustainable Clothing Disposition: Exploring the Consumer Choice to Use Trash as a Disposal Option

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**Abstract:** The textile and apparel supply chain plays an integral role in providing consumers with a continuous supply of apparel that must ultimately be discarded. Viewing the consumer as a player in the process between the supply chain and the post-consumer textile waste stream, this study was designed to explore the consumer apparel disposition process with an eye towards understanding how both supply chain members and post-consumer waste entities can interact with consumers to reduce the amount of apparel discarded in landfills. Hanson's Consumer Product Disposition Process framework was used to help guide the research. Using a qualitative research approach, semi-structured in-depth interviews were conducted with twenty-four female consumers in the United States to address three main research questions. The findings revealed several themes: use of both "compensatory" and "non-compensatory" choice heuristics in decision making; a "usable life" and the "personal nature" of garments as barriers to non-trash disposal options; and the need to "create awareness" and "provide assurance" to encourage alternative disposal modes. Implications for apparel producers and retailers, secondhand stores and textile recyclers are discussed.

**Keywords:** apparel 1; disposal 2; landfill 3; trash 4; post-consumer waste 5

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## 1. Introduction

Textile waste in U.S. landfills increased almost 40% (39.89%) between 1999 and 2009, and is expected to reach 35.4 billion pounds by 2019 [1]. These increases are despite greater efforts among researchers, media outlets, government agencies and non-profit organizations to increase consumer awareness of the environmental consequences of textile waste. The level of waste generated by consumers is a direct consequence of the global textile and apparel supply chain. Given the constantly changing nature of fashion, there is pressure on the supply chain to respond with new products on a frequent basis which is in conflict with the long run approach needed to achieve sustainability [2]. Although there have been shifts towards more sustainable production and distribution practices, what happens at the consumer level is also a key component of addressing sustainability since the apparel acquired by consumers must be eventually be disposed of in some way. As Ha-Brookshire and Hawley [3] indicate, the global clothing and textile supply chain is intricately linked with human clothing needs and wants, and human satisfaction for clothing. Addressing sustainability as it relates to apparel cannot just stop with consumer acquisition of apparel but must address all stages of the clothing consumption process [4] including disposition. In one U.S. study [5], almost forty percent of the participants indicated that they used the trash as a disposal mode for apparel. A study of U.K consumers found that discarding men's and women's clothing in the trash was the second most common disposal method (following donation to charity) among seven disposal options considered. For children's wear, it was the third most common with donation to charity and giving to friends/family having higher percentages. Among six different product categories (clothing; books; record/CD/tapes;

toys; furniture; and other), and covering a total of 151 items, clothing accounted for 49.5% of the items thrown away, a percentage higher than any other category [6]. Since the discard, or disposal stage directly relates to the impact of textile waste on the environment, increasing our understanding of the consumer apparel disposal process is essential in increasing sustainable practices over the apparel product life cycle.

Early studies on the disposition process [7,8] presented general models intended to apply to a range of products while recognizing that product type could influence the process. Since that time, the consumer disposal process for apparel has increasingly gained the attention of researchers. Specifically, motivations to begin the apparel disposal process that have been identified include a full closet, the seasons, desire for a change, the physical condition of the garment and garment type [9]. With respect to disposal modes, researchers have investigated various disposal modes including use of charity, second hand stores, clothing exchanges, gifting, selling and the trash [5,6,9–11]. Despite the existing body of knowledge, the consumer choice of the trash as a disposal option, and the underlying decision making process used to reach that decision, has not been adequately addressed. Questions remain regarding why consumers throw certain products (e.g., underwear) in the trash rather than donating or otherwise keeping the textiles out of the waste stream. The Council for Textile Recycling [1] indicates that all but 5% of textile waste could be put to alternative uses if not disposed of in the trash. This includes items in poor physical condition [1,12]. Given the potential to divert almost all apparel from landfills, further questions arise about why consumers throw items of poor physical quality in the trash. It has been recommended that “further research be conducted on how people discriminate between the disposal options open to them and *why* they choose particular ones” [6]. Understanding the use of trash relative to other disposal modes would contribute to the existing body of literature. Finally, there are also questions about what consumers know about the textile recycling process (i.e., what happens to clothes not placed in the trash). Lack of consumer awareness about the post-consumer waste process for textile based products may hamper the disposal of apparel in sustainable ways. However, this area has not been addressed in prior research.

To address gaps in the literature, the purpose of this exploratory study was to gain insight into the consumer apparel disposition process focusing on the use of trash as an apparel disposal option. More specifically, the following research questions were addressed:

- (Q-1) How do consumers reach their disposal decisions?
- (Q-1a) What is the process by which consumers arrive at the decision to use trash as a disposal option?
- (Q-2) What are the barriers that keep consumers from using alternatives to the trash for their clothing disposal?
- (Q-3) What knowledge do consumers have about the post-consumer textile waste stream?
- (Q-3a) What needs to be done to increase the use of disposal options other than trash?

The exploratory findings from this research were expected to provide a basis for future empirical studies. Addressing these questions will allow academicians and business practitioners to gain a better understanding of the decision making process used by consumer when selecting trash as a disposal option, barriers consumers face when making disposal choice, and consumer knowledge of the post-consumer textile waste stream. Given that disposal provides the fuel for the textile and apparel supply chain to continue its production and distribution of clothing, it is important to understand how companies might facilitate or hinder the process. In addition, consumer knowledge or perceptions about the post-consumer waste stream could be relevant to secondhand stores, charities, and textile recyclers. Central to this study is viewing the issues through a lens of sustainability with an eye towards how apparel might be diverted from the landfill.

## 2. Related Literature and Conceptual Framework

### 2.1. Consumer Apparel Disposal

Although there are many modes of disposal, donation is a widely used disposal mode [5,6,9,13–15]. In a comparison of divestment conduits, among three different types of households in the United Kingdom, Gregson et al. [14] found variations in the number (two to nine) and range of conduits (e.g., charity, friends and family, trash). Hibbert et al. [6] found that U.K. consumers frequently donated clothing to charities or to friends and families although a large percent of clothing was discarded in the trash. Among a range of items discarded in the trash, clothing had the highest percentage of occurrence [6]. In a sample of U.S. female consumers, Norum [5] found that charity was the most frequently used disposal mode (64.54%) followed by donation to secondhand stores (49.17%) and the trash (39.48%) Other less commonly used disposal methods include selling at garage (boot) sales or consignment shops, repurposing (including using as rags) and saving for the future [5,6]. The choice of a disposal mode has been shown to be closely linked to the reason a consumer is disposing of an item. Certain patterns have emerged in the prior research.

Koch and Domina [16] found the most common reason for donating to the Salvation Army or religious organizations was the desire to help the needy. Donating apparel to charity shops made participants feel good [17]. A request for donations by a charitable organization also resulted in the donations to the organization (Ha-Brookshire and Hodges, 2009). Feelings of guilt associated with disposal of rarely worn expensive items resulted in donations to charities [18].

Hibbert et al. [6] found that “to get rid” of goods was related to giving items to family and friends. Sentimental attachment was also found to be a reason for handing down a garment [9]. In a study of Ecuadorian households, older women were found to be instrumental in the mobilization of unwanted clothing that would be disposed of through gifting. Gift giving was found to be related to the interaction of the respondent with the clothing market system as well as an autonomous act where gifting was not due to a new purchase, for example, but rather, the act of giving [11].

Hibbert et al. [6] found the purchase of a new (or replacement) good was related to the use of boot sales. Koch and Domina [16] specifically examined the relationship between various methods of textile recycling and reasons for the discard of garments. The most frequently cited reasons for using as rags, selling at garage sales, selling in consignment shops, and passing on were the physical condition, not wanting to be wasteful, item still having value, and item no longer fitting, respectively.

Physical condition is a primary consideration when determining whether or not to dispose of an item of clothing [9,15,18] with apparel in poor condition frequently being discarded in the trash. Clothing that was ‘cheaper’ and worn for more casual occasions was also discarded in the trash [6,15,18] Ha-Brookshire and Hodges [9] found that certain types of garments, specifically undergarments were frequently discarded in the trash.

### 2.2. Post-Consumer Textile Waste Stream

Of the approximately 25 billion pounds of textile waste generated in the U.S. annually, an estimated 85% goes into the landfill (21 billion pounds) while fifteen percent is donated to charities (not-for-profit organizations) or recycled through private sector (for-profit) recyclers [1]. Approximately 20% of the donated items are sold through secondhand stores while the other 80% is sold to textile recyclers. Most textile recyclers are small, family owned businesses with a global business network [12,19]. According to Hawley [12], textile recycling companies “acquire, sort, process, export, and market pre-and postconsumer textile products for various markets” (p. 265). Over time, the companies have shifted from being primarily “sorting” businesses to “mining” business [12,19]. The textile recyclers sort and separate the textile materials into three general classifications: exports, recycled products, and recycled fiber. Forty-five percent is exported to foreign countries, 30% is recycled and converted into other products, 20% is recycled into post-consumer fiber, and 5% ends up in the landfill [1].

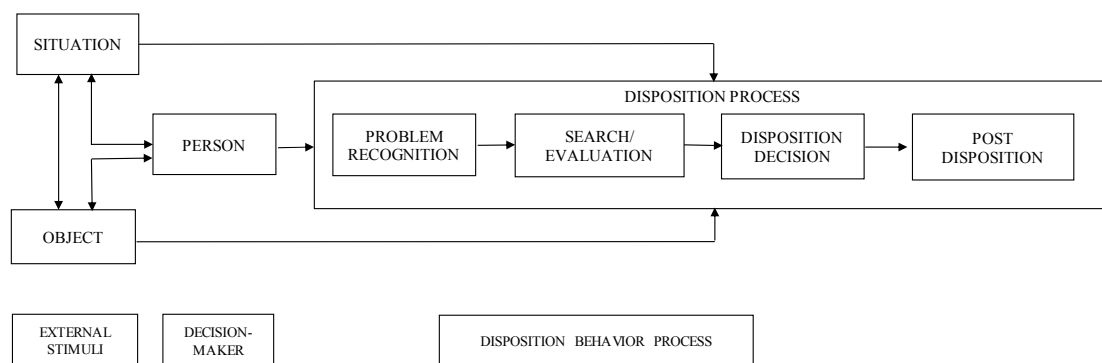
Used textile goods sold to textile recyclers are sold for between three and seven cents per pound [12,19]. Textile items are sorted by product type and gender, and then by fiber content, condition and quality [12,19]. They are then sorted into as many as 400 different categories [19]. The most valuable (1%) are referred to as diamonds [12], and include vintage clothing as well as apparel with specific characteristics based on brands, sports teams, and music groups [19].

Of the used clothing purchased by textile recyclers, approximately 45% is exported [1,12]. It is estimated that the U.S. has almost 40% market share of the world's used clothing exports [19]. Although used clothing is exported all over the world, a large portion is sent to Africa. For export, the quality must be such that the garments are free of stains and tears, and reflect current fashion trends [19].

Approximately, 30% of the clothing that reaches textile recyclers become "wiping" or "polishing" rags [1,12,19]. The majority of this category comes from clothing that is stained, torn, or otherwise unusable [12]. These rags are used as absorbents in both residential and industrial settings [1]. T-shirts are the primary source for the rag cutters and must have at least 15 square inches of usable material to become rags. Those t-shirts not suitable for rags can be converted to recycled fibers. Of the used clothing obtained by textile recyclers, approximately twenty percent become recycled fibers [1,12]. These used textiles are broken down and converted to fibers called shoddy or mungo (Hawley, 2006), and are used as cushions, insulation, carpet pads, mattresses, caskets, and in the lining of cars. High quality shoddy can be spun into low quality yarn for use in inexpensive clothing [12,19].

### 2.3. Consumer Disposition Behavior Process Model

The Consumer Disposition Behavior Process (CDBP) Model [7] provides the underlying conceptual framework for this study (see Figure 1). This model is based on the consumer decision making approach suggested by Jacoby, Berning, and Dietvorst [8], and formalized the Engel and Blackwell [20] model of consumer behavior within the context of disposition behavior. The CDBP model suggests that external stimuli, either situational or object specific, act as triggers to start the disposition process. The characteristics of the decision maker also come into play, and interact with the situational and object characteristics. Four stages comprise the model: problem recognition, search and evaluation, disposition decision; and post disposition outcomes.



**Figure 1.** The Consumer Disposition Process.

With respect to the initiation of the process, problem recognition must occur. This happens when there is a discrepancy between the actual and desired state which triggers the decision making process. Furthermore, cues for problem recognition can come from any stage of the consumption process: acquisition, consumption, or disposal. The acquisition of new clothing, the damage of clothing during use, and style obsolescence that encourages periodic discard are examples [7].

During the second stage, information sources are used to facilitate the disposition decision. Evaluation of alternatives for disposal is viewed as being similar to evaluating options during

consumption. The product being evaluated for disposal has multiple attributes. The focus at this stage is to identify the attribute set, and the relative importance of the attributes. Decision rules, specifically, compensatory or non-compensatory models for evaluation, are used to arrive at a disposition intention. However, the nature of these decision rules for clothing disposal have not been explored in prior research.

The third stage, disposition decision, is influenced by the disposition intention as well as social and situational factors [7]. After the consumer has evaluated a product, they can decide to (1) keep it, (2) temporarily dispose of it, or (3) permanently dispose of it [7,8]. The disposition decision is actually comprised of multiple decisions. For example, once the decision is made to dispose of a garment permanently, a decision must be made regarding the disposal mode. It should be noted that although the consumer desire to keep possessions, including clothing, is an interesting aspect of consumer behavior, this option is not explored in this study. Likewise, temporary disposition (e.g., loaned or rented) and then returned to storage, is not addressed in this study. Rather the permanent disposal option is explored since this alternative includes the use of trash as a disposal mode.

Finally, the last stage of the disposition process is post disposition outcomes. The consumer's reaction to their disposition choice can influence their feeling about the choice, as well as affect future disposition decisions [7].

### 3. Methods

Given the exploratory nature of this study, the research design was based on interpretive inquiry. This approach uses language to gain a deeper understanding of the human phenomenon of interest, in this case the apparel disposal process [21,22]. In-depth interviews were used to gather data. The use of interviews allows for detailed descriptions of each stage of the process, and enable the researcher to grasp the essence of the phenomenon being studied [22,23]. To this end, interviews were conducted in the home of the participants, frequently in their closet. Respondents were asked about their apparel disposition practices within the context of their general clothing consumption. Participant characteristics were collected through a demographic survey at the end of the interview.

After receiving institutional review board approval, a sample of 24 female participants over the age of 35, and of middle to upper middle socioeconomic strata, were identified. Women were selected since, by virtue of being the largest consumers of clothing, they are also the largest disposers of clothing. Consumers of higher socioeconomic status are reported to be more involved in clothing disposal behaviors [11]. Prior researchers have also shown that older consumers are more likely to use the trash for apparel disposal than younger consumers (under the age of 35) [5]. The participants resided in a medium sized Midwestern town in the United States. The majority of the participants were in white collar/professional occupations (e.g., academia, health services, social services, small businesses). Two participants were retired. All but one of the participants had at least a college education. The one who did not have some college education was a small business owner. Four of the participants had an advanced degree. The majority of the participants aged 35–49 had household income of US\$75,000–100,000, and the majority of the participants over age 50 had household income over \$100,000. Most of the women were married.

The interviews were conducted between September 2014 and March 2015. Participants were recruited initially through purposive sampling, and snowball sampling was used to find additional participants. Educational level and occupation were used as indicators of socioeconomic status [24]. The interview process ended once no new ideas appeared to be emerging through the interviews. The repetition of ideas indicates saturation [25], and that continuing the interview process would be unlikely to produce new ideas.

Semi-structured in-depth interviews were conducted in the home of each participant, and in most cases, in their closets. This location was chosen because of proximity to the items of interest (apparel) in this study. The participants' actual clothing served as prompts during the interview process, and allowed the participant to show the interviewer specific examples of something they

might be discussing during the interview process. Participants were asked to talk about their typical process for deciding what clothes to dispose of; where they dispose; and why they selected the specific mode including what went into the trash and why. Participants were also asked about their knowledge of the post-consumer waste process, and what would it take for them to use a disposal option other than the trash. A pilot interview was conducted with a single female consumer over age 35 to check the flow of the questions, and whether the questions were understandable. The researcher and a trained research assistant conducted the interviews. The interviews lasted approximately one hour, and were transcribed verbatim. The transcribed interview data was coded, and interpreted, using an inductive process to build categories and themes [22,23]. Numerous iterations of the data were gone through until distinctive themes were identified, and placed into a broader context based on theoretical considerations.

#### 4. Results

From the interpretation of the interview data, major themes emerged within each research question, and these will be discussed in turn. Two themes emerged describing how consumers reach their disposal decisions, and the choice of disposal modes: compensatory choice heuristic, and non-compensatory choice heuristic.

##### 4.1. How Do Consumers Reach Their Disposal Decisions? What Is the Process by Which Consumers Arrive at the Decision to Use Trash as a Disposal Option?

###### 4.1.1. Compensatory Choice Heuristic

Prior researchers have cited multiple evaluative criteria used by consumers when evaluating apparel for disposal. However, prior studies have not described the choice heuristic, or decision rule, used during the decision making process. From the qualitative analysis of the data, the theme of “compensatory choice” heuristic [20] emerged as the decision rule underlying most apparel disposal decisions.

An integral component of any choice heuristic is the evaluative criteria [20]. As has been found in other studies [9,20], respondents indicated the use of a number of criteria for evaluating each garment being considered for disposal. Among the criteria cited by participants are the physical condition, style, color, fit, initial cost, and item fatigue. As with many of the participants, Susan clearly considered the physical condition as a primary attribute when she said “The first thing (she considers) is if it is worn out”. I’ll look for collar wear, cuff wear, of course, any stains, or whatever”. The use of the word “first” suggests multiple criteria being evaluated.

Georgia pointed out that even when the condition is good, other factors come into play, including style. Discussing pants, she stated: (t)he condition is usually good; it’s just the style is out, and I just don’t wear them”. Along with style, other fashion related variables are considered when deciding whether to keep or get rid of something. Dianne indicated she would be disposing of a garment because “the colors didn’t work for me”. A basic item could also be considered deserving of disposal, even if the physical condition was good, and the style and color were still appropriate, as Jane indicated “this is a T-shirt that I don’t like because it’s too short, and is a little snug, so that’s going”. One of the features of a compensatory decision rule is that a high score on one attribute can compensate for a low score on another attribute [20]. This is supported by Natalie who said “I’ll look at these and think, well now, is this the right length, or is it outdated? So, I’ll look at that too, and if things are a little tight here” indicating trade-offs between fit and style in her disposal decision.

In some cases, a consumer does not dispose of a garment because of the tangible product attributes, but because of intangible attributes associated with the item. One example is the initial value of the item as indicated in this statement by Jane: “It was on a sale rack and *it wasn’t terribly expensive*”. In other cases, the participant got tired of an item as indicated by Mary: “good things that are still decent,

but I'm just tired of wearing them, go to Upscale Resale". This latter statement also suggests that the decision to dispose is intricately involved with the choice of disposal mode.

During the evaluation stage, the consumer makes an initial decision whether, or not, to discard an item as well as a subsequent decision regarding disposal mode. Focusing on permanent discard, where an item could potentially end up in the trash, both the decision rules and choice of disposal mode were explored with the respondents. Respondents were asked "how do you make decisions about which place you're going to take garments?" The quality of the garment, and appropriateness for a particular outlet were main considerations. Matching a garment with an outlet, based on quality, physical condition and current styling, seemed to be an overriding consideration among participants. This is reflected in the following statements by three participants.

Well, first I look at things that need to be repaired or cleaned, or whatever, and then if I wash them, and the spots don't come out, they just go into a Goodwill bag. I take the things that are the least good to Goodwill and then the moderate things go to Salvation Army . . . My good things, that are still decent but I'm just tired of wearing, go to Upscale Resale. Sometimes I have taken some more current pieces to Plato's Closet. (Susan)

As I look at them, I decide, okay, is this something that could be used at Dreams to Reality? Is this something that they could use for their boutique sale? Is this something that would be better going to USAgain? Or is this something I could just throw away? (Mary)

So it's kind of that way with Upscale Resale, because their market is more gently used-still in style, certainly quite a bit of life left, whereas, things that I'd put in the Goodwill box look like they are just not that same level of quality. Things that I would look at as having value to them I separate from things that would not meet their criteria but still be usable to someone. (Dianne)

Each of these three statements reveal the existence of a hierarchy among the disposal modes in the consumers' mind. At the top of the hierarchy are outlets that accept donations or consignment, and both the quality and styling must be deemed appropriate for the image and target market of the outlet. In a second tier, are outlets like the Salvation Army, Goodwill and USAgain. At the bottom of the hierarchy are rags (cited as a disposal method by several respondents). The comments discussed in this section reflect the decision making process that a consumer goes through when they evaluate the attributes of the garment for disposal, and that this evaluation influences their choice of disposal mode. The use of the compensatory choice heuristic as a decision rule leads to non-trash disposal options for which there is an apparent hierarchy in the mind that extends across consumers.

#### 4.1.2. Non-Compensatory Choice Heuristic

It is possible for both compensatory and non-compensatory choice heuristics to be used during decision making. Although consumers frequently stated that they evaluate the physical condition of a garment first, a picture emerged from the data suggesting that the garment type may be the first attribute to be assessed. When participants did not volunteer information about the use of the trash, or only discussed the trash in reference to garments in poor physical condition, they were asked a further probing question, specifically, "What do you do with your underwear?" The answers from multiple respondent included: "I would throw underwear away" (Debbie); "Unless it's in shreds, nothing goes in the trash, except my panties" (Jane); "I throw it away" (Mary); and "Yeah, I pitch underwear" (Linda). When asked about bras, Mary, Debbie and Natalie, responded, respectively: "Throw them away," "I've thrown bras away, too," and "I just throw them out". These comments reflect a non-compensatory model of evaluation in that the apparel item does not meet the minimum criteria for being appropriate to dispose of through a non-trash option. Thus, performance of other attributes cannot compensate for being an undergarment, and non-trash options are removed from the disposal choice set. If the garment is not underwear, the decision making process continues with

the physical condition being assessed. After assessment of the physical condition of the garment, a decision is made to either dispose of the item in the trash, or the attributes of the garment continue to be evaluated through a compensatory process. As these comments about undergarments suggest, most participants indicated they threw away underwear, bras, or both. However, some respondents donated bras they thought were still in good condition. Other respondents used underwear for rags (Natalie), or in one case, Debbie left underwear she had not worn much, but did not like the fit, in a foreign country when traveling.

In addition to the garment type, poor physical condition emerged as a major attribute contributing to the use of trash. No matter what the garment type, the data revealed that respondents will put garments in the trash that they believe are of poor physical quality. This was clearly articulated by Natalie who stated, "I'll look at the things, and if they're not in good condition, I'll get rid of them" (indicating the trash). Debbie also supported this view when she said "You know I got a pair of pants, and I must have sat on something. They are just stained horribly. I wouldn't even give that to the Salvation Army". When further probed, and asked "what about the thing that had such a bad stain that you wouldn't give it to the Salvation Army, what would you do with it? Debbie said "I'd throw it away".

Finally, this conversation with Susan illustrates the dominant role of physical condition relative to other attributes. When asked "do you throw anything in the trash?" Susan responded "Yes, some things I just think, nobody would want this". She was probed by asking "What do they look like? Is it their condition? Their styling?" She responded: "It's their condition so stuff from gardening and working around the house and that kind of stuff . . . "I throw that out. You know, the gardening clothes, I will wear those as long as I can, just because we get so dirty out there, . . . and then there comes a time when it's just time to throw them out".

With respect to decision rules, both non-compensatory and compensatory choice heuristics play a role in apparel disposition decision making. A non-compensatory decision rule with minimum acceptable categories or levels for garment type or physical condition, are most closely tied to trash disposal. If an item meets or exceeds the criteria, the evaluation process continues typically, with a compensatory choice heuristic. A second issue that was of interest in this study is to gain insight into why particular garments are put into the trash, or, in other words, why consumers do not use non-trash options for all their discarded apparel.

#### *4.2. What Are the Barriers That Keep Consumer from Using Alternatives to the Trash for Their Clothing Disposal?*

When asked why some apparel is thrown away in the trash, the themes of a "usable life" and the "personal nature" of a garment emerged as common barriers to using non-trash disposal modes for items frequently discarded in the trash.

##### *4.2.1. Usable Life of Garment*

Early in an interview with Dianne, she said "I don't know how old some of these things that we looked at are, how long they've been sitting there not used. I think about, could it have a happy life somewhere else? Is it still usable? I think about, why is it still here?" When asked "what would constitute not still having wearable life? What would those items look like?" Dianne responded "like the jeans that I'm wearing now, with thread showing through. They practically have holes". When probed further, by being asked, "If you decide that it's not going to have another life, what do you do with it then?" the immediate response was "trash".

In discussing why she does not donate underwear and nylons, Shari referred to the value of the garments:

Seems like something I would not want to buy secondhand so why would I expect anybody else . . . to buy my secondhand stuff like that. Well, the nylons, if I'm getting rid of nylons, they have a hole in them. So, they're like worthless at that point.



The potential for a usable life was reiterated by Alyssa when she said:

No one's going to want to buy a shirt that has a stain on it, you know what I mean? So, I don't want to pass it on to someone else, and have them (the donation site) decide to throw it away because no one's going to buy a shirt with a stain on it.

In general, the physical condition emerged as a main deterrent to donating (or otherwise using a non-trash disposal option). However, responses regarding undergarments revealed a related, but different barrier. That is, certain garments are considered to not be usable by others because of the personal nature of the garment.

#### 4.2.2. Personal Nature of Garment

A common thread regarding the intimate relationship of undergarments to the body, and a sense of being gross or sexually related, underscored the theme of the personal nature of garments being a barrier, particularly for panties. When asked about why underwear was discarded, a common theme is reflected in this statement by Shari: It "seems like a personal or an intimate item". When asked if they have a different attitude towards bras versus panties and giving them away, Amy responded: "Well, yeah, a little bit". When probed about why, she responded "I don't know. I think maybe it's a sexual thing, I don't know". Paula, responding to a similar question about donating undergarments, said: "(b)ras, no I wouldn't be opposed, but underwear I think that's gross, don't you think? I think that's gross!"

Prior research has noted that consumers use the trash for apparel disposal, but have not attempted to uncover why the trash is used. This section reveals that garments with a "usable life" will be disposed of through non-trash modes, unless the garment is an undergarment in which case, the item is not deemed to have a further usable life due to its personal nature. In addition to gaining insight into barriers facing consumers and sustainable apparel disposal practices, knowledge of the post-consumer waste stream was explored which relates to the third research question.

#### 4.3. *What Knowledge Do Consumers Have about the Post-Consumer Textile Waste Stream? What Would Need to Be Done to Increase the Use of Disposal Options Other Than the Trash?*

The post disposition decision stage in the Hanson [7] model encompasses the consumer's reaction or feeling about their disposition choice which can affect future disposition decisions. Rather than asking participants how they felt about past disposal decisions, they were asked about their knowledge of the post-consumer waste process, that is, their knowledge of what happens to their apparel as a results of their disposal choices. They were also asked whether they would consider changing their behavior (i.e., their choice of trash as a disposal mode) which lead to research question 3a. Specifically, participants were asked if they might donate items in poor condition, or undergarments, if there was a specific request, location site, or were told that the items were actually wanted. Creating awareness and the need for assurance were themes that emerged with respect to the third research question.

##### 4.3.1. Need to Create Awareness

When asked questions like "how familiar you are with what happens with your clothes after you donate them?" Alyssa simply responded "None". When asked "Do you know what happens with clothes that don't get bought [by consumers] from places like Goodwill and Salvation Army?" the simple response, as illustrated by both Shari and Amy was "I have no idea". The lack of knowledge about the post-consumer waste stream was widely shared among the participants.

The need to create awareness that all garments are desired, or are acceptable to be disposed of in alternatives other than the trash, can be seen in the following conversation. Tina was asked if there was any condition under which she would donate underwear or garments of poor physical. When she seemed uncertain, an example was given of a separate donation bin labeled as "old underwear here" and Tina was asked if she would donate to such a bin. She responded "Yeah". With further

probing, she was asked “But the reason underwear goes into the trash is because . . . ?” Her response, was “I think they don’t want it”. Similarly, Shari stated “If I knew what I was doing was actually good for other people” and that “I’m doing good for children in Africa” then she would donate items she usually puts in the trash.

Although interviewees were asked about a range of disposal choices, only one respondent discussed using a “take-back” program where the producer/seller promoted a program requesting that consumers return used goods to them. Paula specifically indicated she had used such a program when she said:

I know Patagonia has a clothing recycling program. You can send your stuff back. So, when I’ve had some of their stuff, and there’s holes everywhere because I would wear it so much, I would return it to them, and they would recycle it. But, I thought it had to be a special program.

This comment from Paula suggests that companies may need to take a proactive role if they want to facilitate the recycling of clothes. This reflects the need for consumers to be told that items they deem as unusable still have a usable life, and suggests that apparel producers and retailers can play a role in the post-consumer textile waste stream.

#### 4.3.2. Need for Assurance

In addition to awareness, the theme of needing assurance also emerged from the responses. This is reflected in the comments by Mary:

You know I just realized that they do take it (underwear), but, you know, that’s just such a personal thing. I know it’s anonymous, and nobody knows, but I would hate to think that somebody would look at something, and judge me, even if they don’t know me.

When Laura was given the scenario of a donation bin that stated “old underwear here” and asked how she would feel about donating to that bin, her response was:

You know, I don’t know. And I don’t know why it makes me feel uncomfortable. Because, obviously, they [the underwear] are clean, I would wash them before I’d take them. I just never considered it, and you know, I don’t throw away that much, or get rid of that much. So, I probably would consider it.

Clearly, hesitation can be sensed about donating items that would have been put in the trash. Thus, in addition to creating awareness about being able to donate items that are viewed as unusable, consumers need reassurance to help them overcome the discomfort this idea seems to create for them. Within the Consumer Apparel Disposition model, efforts would be needed to increase awareness during the search for information/evaluation stage, as well as efforts to decrease cognitive dissonance, during the post disposition outcomes stages, should a consumer shift their disposal mode away from the trash.

## 5. Discussion

Achieving sustainability with respect to textile and apparel goods is a complex issue that does not just end with the sale of goods to consumers. The disposition of clothing is an integral aspect of the clothing consumption process [4], and the use of trash during the disposal stage contributes to a less sustainable clothing life cycle. However, the consumer and their consumption process are part of a larger system that also includes the textile and apparel supply chain, and the post-consumer textile waste stream. It is within this broader context that the consumer disposal process, and specifically, the use of trash, was explored. At the disposal stage, disrupting the consumer use of trash for apparel disposal is essential, and this current study contributes to our understanding of the consumer disposal process in ways that may help achieve this goal.

Figure 2 shows the textile and apparel supply chain [3], the consumer (clothing consumption process) [4], and the post-consumer waste stream [1,12] are linked. Solid lines indicate stronger relationships supported by this study while the dotted lines indicate more tentative relationships for which future research is suggested. As Figure 2 suggests, the textile and apparel supply chain is connected to consumers through the consumer desire to acquire apparel, and the post-consumer waste stream is linked to the consumer through disposal. When the consumer enters the apparel disposition phase, a complex decision making process takes place. The themes that emerged from the interviews provide insight on specific stages of the consumer disposition model [7], as well as themes relevant to companies in both the supply chain and PCTW chain. During the evaluation stage, consumers appear to use both non-compensatory and compensatory choice heuristics. If the minimum criteria are not met initially for product type and/or physical condition, the garment is placed in the trash, reflecting a non-compensatory evaluation process. If the minimum criteria is met on both of these attributes, then the evaluation process continues with a compensatory choice heuristic. The outcome of this process determines the disposal mode, and a hierarchy among the non-trash options appears to exist. One area of disposal behavior that could be addressed in future research is the role of social influences on disposal choices.

Given that consumers appear to use a non-compensatory model when evaluating clothes that end up in the trash, ways must be developed to encourage consumers to use options, other than the trash, especially because many of these options already exist, and are already in use by consumers for other disposal needs. When the attribute of “garment type” or “physical condition” is not met in the eyes of the consumer, the consumer is likely to dispose of the garment in the trash. Thus, this is a barrier that must be addressed. A first step would be to change the consumer response to a garment with either of these attributes. Instead of thinking “trash” consumers need to think “this can still have a usable life”. But, how can this be done? Secondhand stores or textile recyclers could actually set up bins designated for apparel that consumers might otherwise discard in the trash. The theme of usable life suggests that consumers are generally amenable to donating these items, if they really feel they are wanted. Consumer education and public relations campaigns by academicians, businesses and non-profits who wish to discourage post-consumer waste from ending up in the landfill could create awareness, which could potentially shift consumers to a compensatory evaluation process resulting in a non-trash outcome. Respondents were asked about a scenario that essentially does not exist (donation bins for underwear), and to provide their feedback. Although respondents provided positive feedback, this is an idea that could be explored in future research (possibly by setting up actual bins at a donation site).

Given the lack of knowledge and misinformation that consumers have about the post-consumer waste textile stream, it appears that there is an additional role for used clothing stores and textile recyclers to play. One is to create awareness and reassure consumers about what can truly be donated/recycled. Second is to educate consumers about what happens to goods after they have been donated. Future research could also address the willingness of secondhand stores and textile recyclers to actively solicit garments that might otherwise be discarded in the trash. In addition, the role these businesses could play in educating consumers about textile recycling could also be explored.

Additional efforts to divert apparel items from the landfill, could involve greater efforts by apparel companies and retailers to intervene in the disposal decision making process. This connection is shown through the dotted line between the textile and apparel supply chain and the consumer evaluation process. For example, what if Victoria Secret took back all of the garments it sold? Although some companies (e.g., Eileen Fisher; Patagonia) are doing this, it can be argued that companies need to not only address sustainability during production or distribution, but also at the end of the consumption process. Thus, all companies in the textile and apparel supply chain could increase efforts to take back, and help recycle used clothing. They could also look for alternative uses for used fibers from the clothing. Future research could explore how garments that are taken back can be reused or reprocessed as part of the post-consumer textile waste stream. Creating awareness and providing assurance that used goods are still usable, and desirable would be an integral part of such programs.

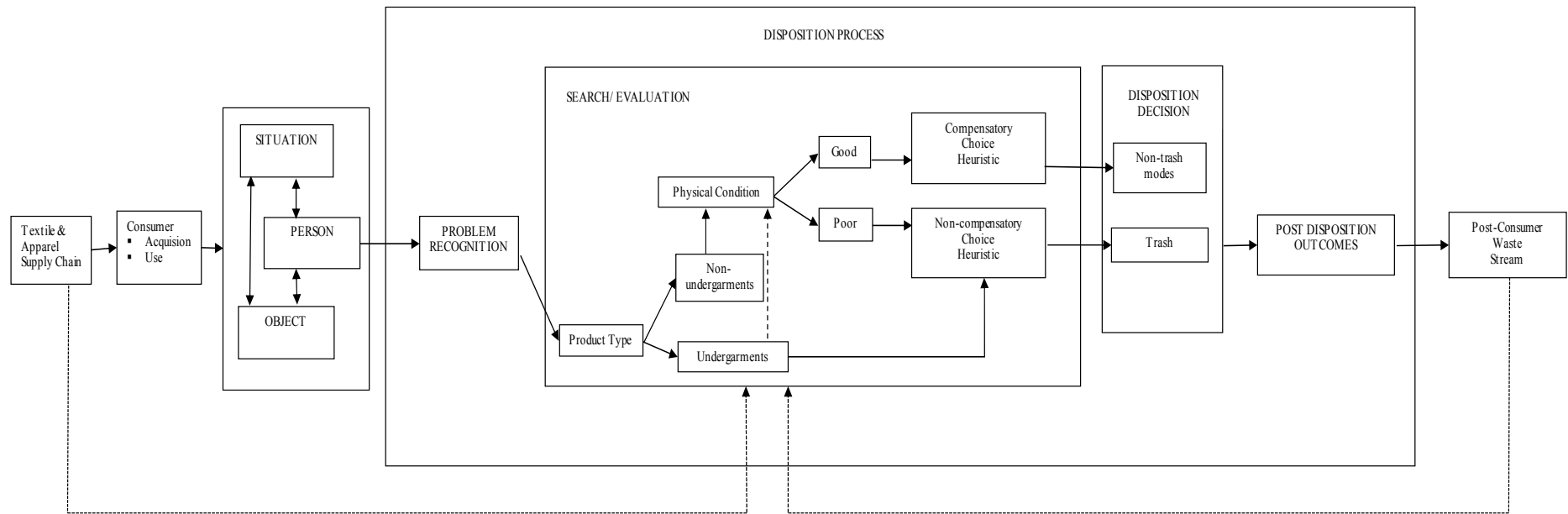


Figure 2. Refined conceptual model of consumer apparel disposition within the textile and apparel supply chain.

Clearly, there are many issues to be addressed if consumers are going to reduce their use of trash for apparel disposal. This exploratory study provided new insights into consumer decision making regarding apparel disposal, and their knowledge of the post-consumer waste stream. However, it would seem that the entire textile and apparel supply chain must not only adopt more sustainable practices in their daily business activities, but consider their role in the entire life of the garment they helped produce and sell. Taking steps to change the apparel disposal process by altering the consumers' evaluation process, and choice of disposal mode seems essential. Informing consumers that all clothing can be recycled or reused is an essential component of the education effort. Working with secondhand clothing stores or textile recyclers to set up specific collection bins for underwear or items in poor physical condition, might help provide a solution. Apparel companies and retailers could expand and promote "take back" programs.

Finally, it should be noted that due to the qualitative nature of this study, the results are not generalizable to a broader set of consumers. Also, the sample used was from the United States and the disposal behavior of consumers in other countries may not be reflected by the participants in this study. Future research is also needed to refine Figure 2, and empirically test ideas generated in this research.

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