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Eliciting Positive Responses to Refurbished Electronics Through Consumer Empowerment

Short Paper

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Abstract

Electronic waste (e-waste) has become the fastest-growing waste stream in the world, with small equipment accounting for a significant portion. Refurbished electronics can satisfy consumers' device needs while enabling the appropriate reuse of replaced devices, promising a pathway to address the problem. However, research concerning consumer perceptions and behaviours towards refurbished electronics remains limited. This research investigates how to elicit consumers' positive responses to refurbished electronics through message framing. Specifically, we suggest that framing the contribution to sustainability from a different perspective (consumers vs. manufacturers) could influence consumers with different personality traits, i.e., power distance belief (high vs. low). People with high power distance beliefs prefer advertisements that emphasise the contribution from the consumers' viewpoint or perspective. Low power distance belief individuals respond indifferently to message frames. This differential effect is due to consumers' perception of empowerment.

Keywords: Refurbished electronics, Message framing, Power distance belief, Empowerment, E-waste, Green IT, Green IS, ICT sustainability

Introduction

There are urgent calls for firm commitments to sustainable development and consumption worldwide. For instance, the United Nations' 2030 Sustainable Development Agenda makes sustainable development and production patterns a distinct goal (i.e., Goal 12 of the 17 SDGs; United Nations, 2015). At the Paris climate change conference, participating countries agreed to work closely to achieve net zero carbon emissions to reduce global warming and build resilience to climate change (UNFCCC, 2015). However, promoting environmental sustainability proves challenging because human activities deteriorate the environment in almost every possible way. The information systems (IS) discipline, i.e., green IS, acknowledges the enabling role of IS in promoting the sustainability of society (Melville, 2010; Elliot, 2011; Watson et al., 2010) but also recognises the negative environmental impacts of ICT itself that IT, IS and related practices are a contributor to environmental problems (Elliot, 2011; Seidel et al., 2010; Hilty & Aebischer, 2015). Electronic waste (e-waste), a major environmental issue associated with device use, requires immediate rectification efforts and is thus the focal concern of this research.

With the rapid digitalisation of the world economy, small intelligent devices have become ubiquitous today as consumers rely on them for various needs. However, electronics have been replaced ever faster (Nevis, 2022). Without appropriately managing these replaced devices, they end up in landfills as e-waste. As a result, small equipment consists of a significant portion of e-waste (Heacock et al., 2016). Against this background, refurbished products can satisfy the needs of consumers for devices while simultaneously

enabling the appropriate reuse of the replaced devices and mitigating the associated negative environmental impacts. The world's leading OEMs (original equipment manufacturers), such as Apple, Dell, or Bose, incorporated refurbished products into their product portfolio, making these greener and more sustainable alternatives available and signalling their commitment to sustainability. However, consumers view refurbished electronics as less attractive (Van Weelden et al., 2016; Abbey et al., 2019; Wallner et al., 2022) and are less willing to pay for these products (Harms & Linton, 2016). The objective of this research is to examine how to elicit consumers' positive responses to refurbished electronics through advertisement message framing, thus attaining the benefits that refurbished electronics can bring to environmental sustainability.

Both manufacturers and consumers play a crucial role in promoting sustainability by producing or directly consuming these products. We postulate that advertisement frames that highlight the contribution from different points of view may prompt people to view the subject from different vantage points, thus influencing their responses to refurbished products. Specifically, we examine whether the framing effect is contingent on consumers' power distance beliefs (PDB). Hence, the research question of this study is: whether advertisements that emphasise the environmental sustainability benefits of consuming refurbished electronics, from the consumer's perspective, will yield varying levels of effectiveness in generating positive consumer responses compared to advertisements focusing on the manufacturers' perspective, based on the power distance beliefs of consumers.

This research is essential, timely, and relevant, as refurbished electronics have increasingly been made available in the consumer markets, with great potential in fostering environmental sustainability in Information and Communications Technology (ICT). Firstly, this research promotes consumers' positive responses and adoption of refurbished electronics as a greener alternative, reducing negative environmental impacts involved with producing and disposing of electronics. Also, it extends the existing knowledge from marketing research and consumer psychology to the relatively underexplored area of refurbished device consumption to elicit favourable responses. To the best of our knowledge, this study is the first to examine PDB's potential influence on the consumption of refurbished electronics. In addition, this research, inspired by real-world challenges as manufacturers attempt to achieve sustainability through refurbishment, thus expects to have managerial significance for promoting refurbished products effectively.

The rest of the article will first discuss the theoretical foundation of the research, including a discussion of sustainable development and green IS, the manufacturers' and consumers' involvement in refurbished electronics, message framing, and power distance belief, followed by the development of hypotheses. Afterwards, the methodology and expected theoretical and practical implications will be described. Finally, the article includes a brief conclusion.

Theoretical Foundation

Sustainable Development and Green IS

Environmentally sustainable development is the emerging dominant challenge of the 21st century, requiring urgent attention (Melville, 2010; Watson et al., 2010; Seidel et al., 2010). While achieving environmental sustainability may require multidisciplinary work (Elliot, 2011), green IS research, as a subfield of IS discipline, exercises the enabling role of IS to encourage sustainable practices in society, such as through enabling and transforming sustainable processes and practices in organisations (Melville, 2010; Elliot, 2011) or applying IS thinking and skills to increase energy efficiency (Watson et al., 2010). This green IS research has been described as "Green by ICT" (Hilty & Aebischer, 2015, p. 19). In addition, the green IS also acknowledges the adverse environmental effects of ICT itself, concerning "sustainable in ICT" (Elliot, 2011; Seidel et al., 2010; Hilty & Aebischer, 2015). It studies IT, IS and related practices as contributors to environmental problems. For example, IT accounts for 2% of global greenhouse gas emissions (Elliot, 2011). Besides, e-waste, the primary concern of this research, has developed into the fastest-growing waste stream in the world.

With the rapid digitalisation of the world economy, modern societies have become increasingly reliant on electronic devices. In recent years, various digital devices, such as smartphones and tablets, have become ubiquitous, fulfilling a variety of applications on a daily basis. While at the same time, these digital devices are replaced at an ever-accelerating speed by their owners. A recent survey report shows that almost 20%

of the surveyed subjects upgrade their smartphones once per year, while 62% replace them every three to four years (Nevis, 2022). Without appropriate recycling and reuse, these replaced devices are discarded as e-waste, ending in landfills and harming the environment. Therefore, it is unsurprising that small equipment accounts for a significant portion of e-waste, requiring immediate rectification efforts (Heacock et al., 2016). This research examines how to promote refurbished electronics consumption to address the problem of e-waste and ICT sustainability.

The Manufacturers' and Consumers' Involvement in Refurbished Electronics

Refurbishment, as a circular strategy, provides a promising solution to achieve sustainability in ICT. Refurbishment acts as a procedure before a device ends its lifecycle (Stahel, 2016). This process restores used devices to "like new" conditions and ensures they function as a similar new product (Abbey, Meloy, et al., 2015). Thus, refurbishment extends the lifetime of consumer products and offers the most direct path to reusing an obsolete or replaced device. Therefore, refurbishment can offer substantial environmental benefits (Murugesan, 2008). For example, it could help save the natural resources needed to produce brand-new products, mitigates air and water pollution, e.g., by avoiding creating brand-new parts or extracting raw materials, and reduces waste or landfills, which can release toxins into the atmosphere and groundwater, harming the environment.

Manufacturers and consumers play a critical role in realising the environmental benefits of refurbished products. The world's leading OEMs, such as Apple, Dell, and Bose, have been actively involved in providing refurbished electronics to their product portfolio. They see refurbishment as a critical way to reduce footprints and achieve sustainability goals. However, refurbishment can only reach its potential if consumers purchase and use them. Research concerning consumer perceptions and behaviours towards refurbished electronics reveals that refurbished devices may not appeal to consumers. Researchers find that consumers' willingness to pay for products (e.g., cameras or cell phones) with refurbished components is significantly lower (Harms & Linton, 2016). Consumers may negatively associate dirty, worn, and disgusting with refurbished products (Abbey, Meloy, et al., 2015). Moreover, promoting refurbished electronics with discounts, a commonly used strategy to promote products, may not be effective (Esmaeilian et al., 2021).

The research on consumer responses to refurbished products further shows that consumers' attitudes and behaviours towards refurbished products are malleable. Van Weelden et al. (2016) suggest that educating consumers and increasing awareness is effective at raising acceptance. Reducing the perceived risks, such as providing consumers with performance tests against new products, could help promote refurbished electronics (e.g., smartphones; Abbey et al., 2019). Other techniques, such as adding an eco-certificate (Harms & Linton, 2016) and embodying a timeless design (Wallner et al., 2020), encourage refurbished product consumption. Our research seeks to elicit consumers' positive attitudes and behaviours towards refurbished electronics through message framing, i.e., by framing advertisements emphasising the different points of view of contribution to sustainability (i.e., consumers or manufacturers).

Message Framing

Framing theory assumes that how an issue is characterised in communication can influence how audiences understand it (Scheufele & Tewksbury, 2007). Framing is rooted in both psychology and sociology. The sociological foundations of framing assume that individuals cannot fully understand the world and constantly seek to interpret their life experiences and make sense of the world around them. To frame is to select some aspects of a perceived reality and make them more salient in communication (Entman, 1993). According to Entman (1993), framing highlights some bits of information about the subject and elevates them in salience, making this information more noticeable, meaningful, or memorable to audiences. As a result, the frame determines whether people notice, understand, and remember a problem and how they evaluate and act upon it.

The psychological origin of framing is rooted in prospect theory (Tversky & Kahneman, 1981). Prospect theory suggests identical decision-making scenarios presented differently influence people's evaluations and choices of the effectively same options. Tversky & Kahneman (1981) argue that a decision problem can often be framed in more than one way. Perspective changes often reverse the relative desirability of options due to imperfections of human perception and decision-making. They argue that different frames prompt

people to view options from different vantage points, leading them to adopt different reference points or perspectives. Therefore, framing impacts one's perspective, affecting the relative desirability of options and influencing one's choices.

Framing has been shown to affect consumer behaviours in various marketing contexts, such as in healthcare product advertising (Chang, 2007), food product labelling (Levin, 1987), consumer recycling (White et al., 2011), and green advertising (Chang et al., 2015). In this research, we investigate whether emphasising the contribution to sustainability from the manufacturers' or consumers' perspective (point of view) in an advertisement could influence consumers' attitudes and behaviours towards refurbished products differently. We attempt to examine whether the effect of message framing is contingent on consumer personality traits, specifically, power distance belief.

Power Distance Belief (PDB)

Inequality exists commonly within any culture, and the degree to which their people accept that disparity varies among cultures (Zhang et al., 2010). Power distance belief (PDB) was first brought up as a cultural factor by Hofstede (1980), reflecting the degree to which people expect and accept power disparity at a cultural or societal level. While Hofstede's cultural dimensions, such as PDB, have been criticised for their inability to capture the richness of national cultures, these dimensions, seen as manifestations of national culture, have nevertheless been argued to be an approximate indication of tendencies within the diverse spectrum of cultural values (McSweeney, 2002; Williamson, 2002). PDB then evolved into a personality characteristic elicited at an individual level, describing individual differences in how they expect and accept power inequality (Winterich & Zhang, 2014; Yan et al., 2021).

The critical difference between high and low PDB is not power disparity per se but people's attitudes toward power inequality. High PDB societies, often in the East, see inequality as the basis of societal order. The norm of high PDB cultures is that everyone should have a "defined" place within the social order (Winterich & Zhang, 2014). As a result, high PDB individuals tend to maintain an awareness of power disparities, act according to their status in the social hierarchy, and ensure others' social positions are accommodated. Conversely, low PDB cultures, commonly Western, believe in equality and seek to minimise inequality. So, low PDB individuals are more likely to prefer nonauthoritarian environments and deemphasise authority (Song et al., 2021; Brockner et al., 2001).

The effect of PDB has been well examined in organisational studies, particularly in people's reactions to authority (Brockner et al., 2001; Bochner & Hesketh, 1994; Winterich & Zhang, 2014). Researchers have recently started investigating how PDB affects consumer behaviour. The literature shows that PDB influences a wide range of consumer behaviours, such as impulsive buying (Zhang et al., 2010), charity giving (Winterich & Zhang, 2014; Han et al., 2017), sustainable consumption (Yan et al., 2021), and status consumption (Gao et al., 2016).

Hypothesis

In this study, the contribution to sustainability is framed from the viewpoints of consumers or manufacturers, as both manufacturers and consumers are involved in producing or directly consuming refurbished products, respectively. The sustainability of the outcome is thus essentially identical but communicated differently to consumers from these varied perspectives. We hypothesise that high PDB consumers are more likely to prefer marketing appeals highlighting consumers' contributions to sustainability. High PDB individuals maintain an awareness of power disparities and act according to their place in the social hierarchy. We argue that high PDB consumers inherently view the world as more hierarchical and imbalanced in power, thus showing the inner need for power to gain status (Gao et al., 2016). Therefore, emphasising the environmental contributions from their (consumers') perspective may prompt high PDB customers to signal that they are in control and have power and superior status, thereby eliciting more favourable responses. In contrast, we suggest that low PDB individuals show less difference when highlighting the different contribution perspectives in marketing appeals. Low PDB individuals endorse equality in social interactions and do not maintain awareness of power equality. Thus, emphasising consumers' contribution does not prompt low PDB consumers to perceive that they are in a superior position. Hence, they are likely to show indifferent responses to different perspective-highlighting frames.

We postulate that the differential effect of emphasising contributions to sustainability from a different perspective for consumers with different PDB is mediated by the perception of empowerment. We suggest that high PDB consumers are more likely to prefer marketing appeals highlighting consumers' contributions to sustainability because it enhances consumers' power perception compared with emphasising manufacturers' contributions, wherein firms retain power. By highlighting consumers' contributions, a feeling of vicarious empowerment may emerge for high PDB consumers as they imagine themselves contributing to sustainability. We predict that the perception of empowerment may be more fluent and accessible to high PDB consumers, as it is a feeling that resonates with their preference for maintaining social order (Dahl et al., 2015). In contrast, low PDB individuals do not feel the same level of empowerment as they are less conscious of social order. They may experience weaker feelings of empowerment because the feeling of empowerment is inconsistent with their endorsement of social equality. Formally, we hypothesise:

H1: The advertisement that emphasises the contributions to environmental sustainability from a consumer perspective (vs. a manufacturer perspective) will elicit a more positive response to refurbished digital products in individuals with high (vs. low) PDB.

H2: The impact of emphasising the contributions to environmental sustainability from a consumer perspective (vs. a manufacturer perspective) is mediated by the perception of empowerment among high-PDB individuals but not among low-PDB individuals.

Methodology

Two experimental studies have been designed to test the hypotheses. The experiments will be administered through the online platform Amazon Mechanical Turk (MTurk). Study one utilises a one-factor (sustainable contribution perspective: consumers vs. manufacturers) between-subject design. We create a business context that explains to participants what refurbished products are and how these products can bring environmental benefits with two different versions of an advertisement for a refurbished product (i.e., a headphone, study stimuli shown in Table 1), manipulating the contribution perspective. Participants will be randomly allocated between the two conditions. Participants read "Purchase Refurbished Electronics Make Your Own Contribution to Sustainability" in the consumer perspective advertisement. Participants read "Purchase Refurbished Electronics Support Manufacturers' Commitment to Sustainability" in the manufacturer perspective advertisement.

	Consumer Perspective	Manufacturer Perspective
Study 1		
Study 2		

Table 1. Study Stimuli

Participants will then report their purchase intentions, the amount they are willing to pay, the percentage of the original price they are willing to pay and their attitudes towards the advertised refurbished product, which are the dependent variables (measurement items described in Table 2). This experiment will measure participants' PDB (five items, sample items described in Table 2; Yoo et al., 2011; Winterich & Zhang, 2014). We will run a series of ANOVAs (Analysis of Variance) to analyse the influence of the contribution perspective, PDB, and the interaction effects on the dependent variables. If H1 holds, we expect to observe a two-way interaction effect between message framing and participants' PDB level.

Construct	Item Description	Source
Purchase Intention	When you purchase an electronic product, how likely will you consider a refurbished one? (1 = not likely at all; 9 = very much likely)	-
Amount Willing to Pay	Please indicate how much you are willing to pay for this refurbished headphone/laptop.	-
Percentage (of original price) Willing to Pay	I will prefer this refurbished headphone over its non-refurbished counterpart if it is priced at ___% of the original price.	-
Consumer Attitudes	Please describe your feelings about the refurbished product in the advertisement you just read. (unappealing/appealing; unfavourable/favourable; unlikable/likeable)	-
PDB Measurement	**PDB1:** People in higher positions should make most decisions without consulting people in lower positions. **PDB2:** People in higher positions should not ask the opinions of people in lower positions too frequently. **PDB3:** People in higher positions should avoid social interaction with people in lower positions. (1-9 Likert scale, 1=Strongly Disagree, 9=Strongly agree)	(Yoo et al., 2011; Winterich & Zhang, 2014)
PDB Manipulation (reorganize of scrambled words, sample items)	**HPDB1:** Social order for is hierarchy our necessary. **HPDB2:** Necessary subordinates to superiors our social order obedience from is for. **HPDB3:** A defined place have should everyone high or low.	(Dahl et al., 2015; Paharia & Swaminathan, 2019)
	LPDB1: Social order for is hierarchy our unnecessary. **LPDB2:** Not necessary subordinates to superiors our social order obedience from is for. **LPDB3:** Equal everyone created is.	
Perception of Empowerment	**PoE1:** When I think about buying this refurbished device, I feel like I could have an impact on contributing to sustainability. **PoE2:** Purchasing the advertised refurbished product makes me feel that I can make a difference. **PoE3:** Purchasing the advertised refurbished product makes me almost feel like I have been 'empowered'. **PoE4:** When I think about using the advertised refurbished product, I personally feel important, valuable and worthy. **PoE5:** The purchase of this refurbished item makes me feel like I have power on the contribution of sustainability. **PoE6:** The purchase of this refurbished product makes me feel like I could directly influence on sustainability. (1-9 Likert scale, 1=Strongly Disagree, 9=Strongly agree)	(Dahl et al., 2015; Paharia & Swaminathan, 2019)

Table 2. Construct Measurement and Manipulation

Study two aims to replicate study one by using a similar marketing scenario with a different electronic device (i.e., a laptop, stimuli shown in Table 1) to enhance the generalizability of research findings. This experiment manipulates the PDB (high vs. low) through a PDB prime task (Dahl et al., 2015; Paharia & Swaminathan, 2019). Participants will be shown sets of scrambled words (twenty items, sample items shown in Table 2) and asked to reorganise these words to form meaningful sentences, such as in the disguise of a writing assessment study. The contribution perspective (consumers vs. manufacturers) is manipulated using a similar approach to study 1. Thus, study two is expected to provide further support for H1. Study two also seeks to test the underlying mechanism by conducting a mediation analysis using PROCESS models (Hayes, 2018) and establish that the perception of empowerment (six measurement items, described in Table 2; Dahl et al., 2015; Paharia & Swaminathan, 2019) mediates the framing effect supporting H2.

Expected Theoretical and Practical Implications

The research is expected to have both theoretical and practical implications. As refurbished products are becoming increasingly prevalent, consumer and IS research on refurbished electronics remains scant and needs improvement. Firstly, while information systems scholars well acknowledge the direct negative impacts of IS on environmental sustainability (i.e., the first-order effects, Watson et al., 2021; Elliot, 2011; Seidel et al., 2010; Hilty & Aebischer, 2015), research on effectively addressing this negative aspect is scant. This research investigates how to elicit consumers' positive responses and the adoption of refurbished electronics as a greener and more sustainable IT device alternative. Thus, it suggests a novel actionable strategy to encourage green ICT consumption, with potential influences at a societal level, directly promoting sustainability in ICT and contributing to green IT/IS research. Secondly, message framing has been widely investigated in various consumption contexts (Chang, 2007; Levin, 1987; White et al., 2011; Chang et al., 2015), and such established implications remain to be tested in this relatively new research area of refurbished electronics consumption. This research fills this gap and expands the theoretical understanding of message framing in the context of sustainability-oriented device consumption. Thirdly, this study is the first to bring power distance belief into the refurbished products marketing context, thus contributing theoretical understanding of PBD as a vital personality trait in a less developed research area of green IT devices consumption. For practical implications, the research results are expected to provide managerial insights to managers or marketers on how to promote refurbished products effectively, such as through advertising to stress sustainability contribution perspectives based on the segmentation of consumers with different power distance beliefs.

Conclusion

This research examines the effectiveness of advertisement message manipulations in altering consumer attitudes and behaviours towards refurbished electronics. We suggest that highlighting the contribution perspective to sustainability from consumers or manufacturers, leading to consumers' differential perceptions of empowerment, subsequently influences their attitudes and behaviours towards refurbished products. Our study expects to have significant theoretical and practical implications.

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