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To Bin or Not to Bin?
The Role of Perceived Consumer Effectiveness on Sustainable Disposal Behavior

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TUM School of Management
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Abstract

Although many consumers are aware of the negative impact of the growing amount of waste generated on the environment, they often fail to dispose of unwanted products in an environmentally friendly manner. One of the main reasons for this lack of proactivity with regards to environmentally friendly disposal behavior is that individuals might not engage in behavior they deem ineffective. By thinking that their actions will not make a difference in solving environmental problems caused by waste generation, some consumers tend to be passive and not take action. This thesis investigates how consumers' intentions to reuse products and reduce waste are affected when they believe or are informed about their effectiveness (or ineffectiveness) when engaging in sustainable disposal behaviors. It assesses the power of perceived consumer effectiveness on the willingness to reuse products and reduce waste throughout six different studies conducted in three countries (Germany, USA, Brazil; total N = 1,920). The studies show that both measured and supraliminal primed perceived consumer effectiveness have a positive impact on intentions to reuse products and reduce waste, whereas informed consumer effectiveness produces a negative impact on these behavioral intentions. The negative impact is explained via the Theory of Cognitive Dissonance and Appraisal Theory of Emotions. Empirical evidence is provided by considering emotion-related appraisals as a mediator and the consideration for immediate and future consequences as moderators. The results showed that informed consumer effectiveness had a negative impact on anger—the most salient negative emotion identified by appraisals—, which in turn had a positive effect on willingness to reuse products and reduce waste. This relationship was stronger for individuals with low (vs. high) concern for immediate outcomes, that is, an indicator that people are concerned about their potential immediate harm to the environment caused by their actions, whereas there was no effect for low (vs. high) consideration for future consequences. The results of this thesis are particularly relevant for policymakers and campaign managers that wish to promote change

towards an environmentally friendly disposal behavior via the implementation of perceived consumer effectiveness in intervention and communication activities.

Zusammenfassung

Obwohl vielen Konsumentinnen und Konsumenten die negativen Auswirkungen des wachsenden Ausmaßes an Abfällen in der Umwelt bewusst sind, versäumen sie es häufig, die nicht mehr gebrauchten Produkte umweltfreundlich zu entsorgen. Einer der Hauptgründe für diese fehlende Proaktivität mit Blick auf ein umweltfreundliches Entsorgungsverhalten ist, dass Einzelpersonen ihr Verhalten als ineffektiv wahrnehmen. Sie denken, dass ihr Handeln keinen Beitrag zur Lösung des durch Abfallerzeugung entstandenen Umweltproblems hat. Deswegen tendieren einige Konsumentinnen und Konsumenten dazu, sich eher passiv zu verhalten und keine entsprechenden Maßnahmen zu ergreifen. Diese Dissertation untersucht, wie die Absichten der Konsumentinnen und Konsumenten hinsichtlich Wiederverwertung, Müllreduzierung und nachhaltigem Entsorgungsverhalten beeinflusst werden, wenn sie über die Effektivität (oder Ineffektivität) ihres Handelns informiert werden. Sechs Studien in drei Ländern (Deutschland, USA, Brasilien, Gesamt N = 1.920) beurteilten, wie stark die wahrgenommene Effektivität des Einzelnen – im Englischen *perceived consumer effectiveness* genannt (hier mit *wahrgenommener Effektivität* übersetzt) – die Bereitschaft beeinflusst, Produkte wiederzuverwerten und Abfälle zu reduzieren. Die Studien zeigen, dass sowohl die mit Skalen gemessene als auch die supraliminal geprägte wahrgenommene Effektivität positive Auswirkungen auf die Absichten, Produkte wiederzuverwerten und Abfall zu reduzieren, haben. Wenn Konsumentinnen und Konsumenten hinsichtlich ihrer Effektivität informiert werden, hat dies einen negativen Einfluss auf die untersuchten Verhaltensabsichten. Diese negative Auswirkung kann durch die Theorie der kognitiven Dissonanz und Einschätzungstheorie der Emotionen (*Appraisal Theories of Emotions*) erklärt werden. Dabei werden sowohl Ärger – die

saliente Emotion auf Basis der Einschätzungen – als Mediator, als auch die wahrgenommene Betrachtung der unmittelbaren und zukünftigen Folgen eigenen Handelns (Consideration of Immediate and Future Consequences) als Moderatoren betrachtet und empirische Belege für die Zusammenhänge erbracht. Die Ergebnisse zeigen, dass informierte Effektivität einen negativen Einfluss auf Ärger hatte, welcher wiederum einen positiven Effekt auf die Bereitschaft zur Wiederverwertung von Produkten und Reduzierung von Müll hatte. Dieser Zusammenhang ist bei Personen mit geringen (vs. großen) Bedenken für unmittelbare Folgen des eigenen Handelns für die Umwelt, d.h. achtsame Konsumentinnen und Konsumenten, besonders stark. Bei der Betrachtung geringer (vs. großer) zukünftiger Folgen für die Umwelt, gab es hingegen keinen Effekt. Diese Ergebnisse der Dissertation sind von Relevanz für Entscheidungsträger und Kampagnenmanagerinnen und -manager, die sich für mehr umweltfreundliches Entsorgungsverhalten mittels der richtigen Umsetzung von wahrgenommener Effektivität in Maßnahmen und Mitteilungen einsetzen.

To Bin or Not to Bin? The Role of Perceived Consumer Effectiveness on Sustainable Disposal Behavior

1 Introduction

Even though there are indicators that caring for the environment has become an important aspect of daily life (Gould, Ardoin, Biggar, Cravens, & Wojcik, 2016), not many consumers behave in a pro-environmental way by improving their disposal behaviors (Cruz-Cárdenas & Arévalo-Chávez, 2017; Whitmarsh & O'Neill, 2010). One of the reasons for this is that consumers often think they fail to make a difference, that is, they doubt their effectiveness (Kollmuss & Agyeman, 2002). This thesis aims to assess how consumers' intentions to reuse products and reduce waste are affected when they believe or are informed that they can be effective (vs. ineffective) as a result of their environmentally friendly disposal behaviors.

1.1 Motivation and Aim

According to the Statistical Office of the European Union (EUROSTAT, 2018), the EU's 2018 estimated waste generation will be around 246,377,000 tons. Although a big part of this waste will be treated, an estimated 59,109,000 tons of waste end up at landfills. Consumers and industry are central to the problem, as consumption and production patterns are directly associated with the amount of waste generated. There are measures in place to combat this volume of waste. For example, the Waste Framework Directive outlines an important hierarchy, starting with the prevention of waste generation and the reuse of products (European Parliament, 2008). This waste management hierarchy aims to avoid sending waste to landfill and

focuses on one important factor for the prevention and reuse of waste: consumers and their sustainable disposal behavior.

Sustainable disposal behavior in this thesis (used here in reference to the environmental component of sustainability and thus used interchangeably with environmental-friendly and pro-environmental disposal behavior) is related to disposal behavior which takes into account the impact of this behavior on the present and future environment, considering the legacy for future generations. There is a gap between this sustainable disposal behavior and consumers' environmental awareness: many consumers fail to dispose of products in an environmental-friendly manner, although they claim to be concerned about the environment. One possible explanation for this divergence is that individuals perceive their actions as not effective and by doubting their effectiveness, they are less likely to take action (Kollmuss & Agyeman, 2002). This thesis aims to investigate whether this perceived consumer effectiveness has an impact on consumers' willingness to reuse products and reduce waste. It further assesses the use of perceived consumer effectiveness in communication in the form of informational appeal and gives a better insight into the mechanism behind the relationship between informed consumer effectiveness and pro-environmental disposal behavior.

1.2 Structure of the Dissertation

This dissertation is organized as follows (Figure 1): Chapter 1 describes the background of this work and presents the general introduction to the topic, as well as the structure of the dissertation. Chapter 2 focuses on sustainable behavior, more specifically product reuse and waste reduction. It highlights the importance of environmental-friendly disposal behavior on macro, meso and micro levels.

Figure 1: Overview of the Dissertation

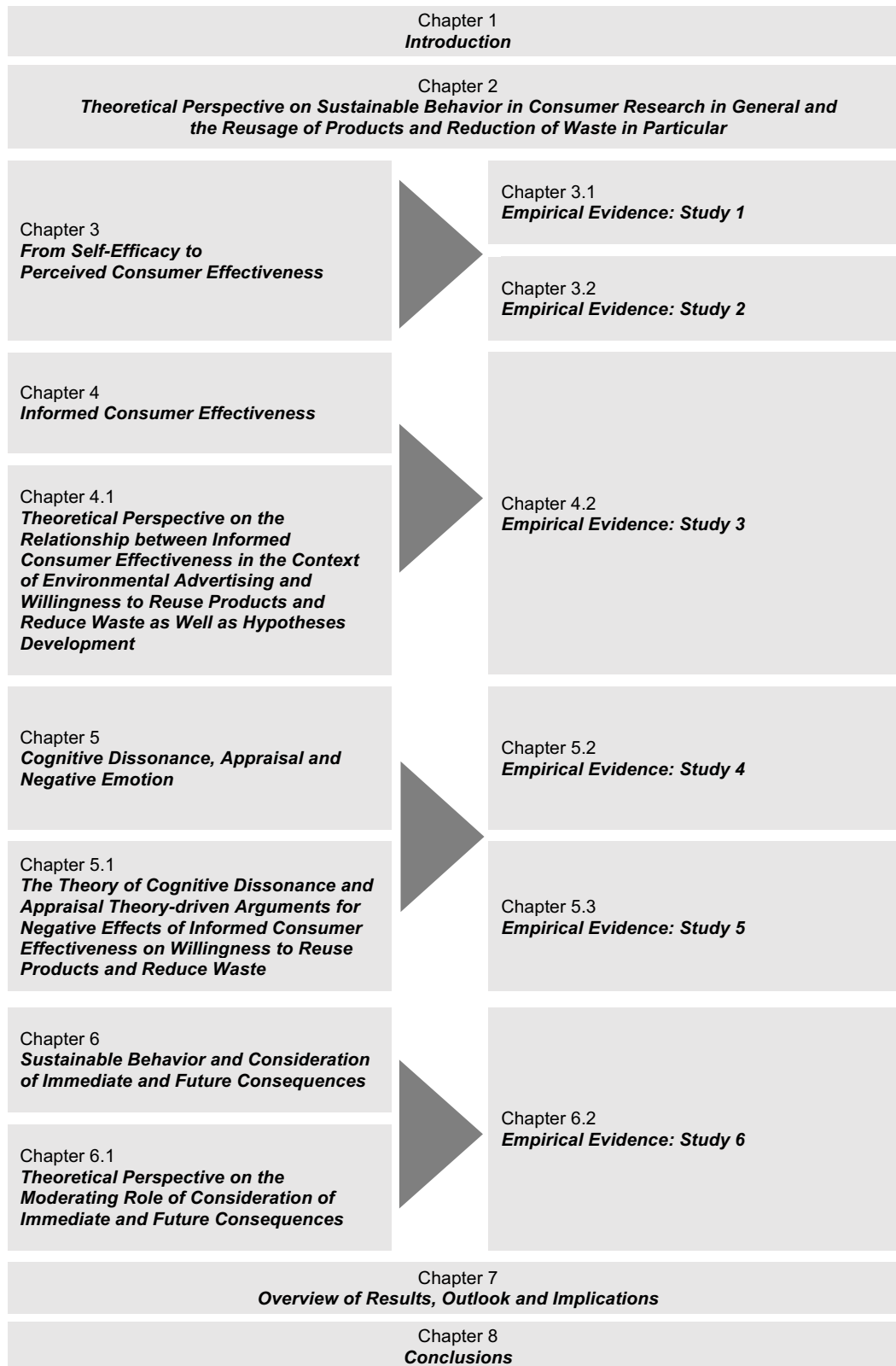


Figure 1. Source: Own illustration

Chapter 3 introduces the concept of perceived consumer effectiveness, from its roots in self-efficacy. It draws special attention to the use of the concept in the literature on sustainable behavior and the importance of such construct as an influence of disposal behavior. This chapter is followed by Study 1 and Study 2. Study 1 explores the relationship between measured perceived consumer effectiveness and the individuals' willingness to reuse products and reduce waste. In this study, data was gathered via an online questionnaire from 252 participants in the US. Study 2 addresses the same relationship while priming perceived consumer effectiveness, instead of measuring it. A computer-lab experiment was conducted in Germany, and there was a total of 185 participants. The results of both studies (Study 1 and 2) are important to start understanding the role of perceived consumer effectiveness on willingness to reuse products and reduce waste.

Perceived consumer effectiveness can be communicated via verbal persuasion (Bandura, 1977). In order to understand whether there is an impact of informed consumer effectiveness on willingness to reuse products and reduce waste, Chapter 4 highlights the possible effects of informed consumer effectiveness and explores the influence of high (versus low) informed consumer effectiveness on individuals' willingness to reuse products and reduce waste (Study 3). A pen-and-paper survey was conducted in Brazil, and there was a total of 176 participants.

Negative emotions might play a role when someone tells another person whether she or he is effective or not (informed consumer effectiveness). Chapter 5 discusses the mechanism of cognitive dissonance and how appraisals and their subsequent emotions might influence how an individual reacts to informed consumer effectiveness. Study 4 uses appraisal theory to explore the appraisals present when reading texts on high (versus low) informed consumer effectiveness. An online survey in the US was conducted, and data was gathered from 121 participants. Participants answered questions related to the appraisal of situational state, probability, legitimacy, agency, power, and motivational state, which indicated the emotion

elicited by the high and low informed consumer effectiveness conditions. This emotion is further explored in Study 5, by examining the mediation chain of informed effectiveness influencing this negative emotion (anger), which in turn impacts willingness to reuse products and reduce waste. Data was gathered from 582 participants in the US via an online survey.

Considering that consequences of environmental-friendly actions are only visible in the long run, the temporal constructs of consideration of future and immediate consequences might moderate the relationship between informed consumer effectiveness on willingness to reuse products and reduce waste via negative emotions. Therefore, Chapter 6 introduces the constructs of consideration of future and immediate consequences, followed by Study 6, which tests the hypothesis that consideration of future and immediate consequences will have an impact on the mediation chain informed consumer effectiveness, anger and willingness to reuse products and reduce waste. An online survey was conducted in Brazil and data from 604 participants was gathered (Table 1 gives a summary of the main characteristics of Studies 1 to 6).

Chapter 7 gives an overview of the results, as well as managerial and theoretical implications and limitations. At last, Chapter 8 outlines an overall conclusion for this dissertation.

Table 1: Main Characteristics of Studies 1 to 6

	Study 1	Study 2	Study 3	Study 4	Study 5	Study 6
IV	Measured PCE	Primed PCE (sentence scramble task)	Informed PCE (press release)	Informed CE (press release)	Informed CE (press release)	Informed CE (press release)
DV	Reuse products and reduce waste	Reuse products and reduce waste	Reuse products and reduce waste	Appraisals	Reuse products and reduce waste	Reuse products and reduce waste
MED and MOD					Negative emotions (MED)	Anger (MED); Consideration of immediate and future consequences (MOD)
Sample	N = 252 US	N = 185 Germany	N = 176 Brazil	N = 121 US	N = 582 Brazil	N = 604 US
Design	Online survey (mTurk)	Computer-based lab experiment	Pen-and-paper survey	Online survey (mTurk)	Online survey (OpinionBox)	Online survey (mTurk)

Note. IV = independent variable; DV = dependent variable; CE = consumer effectiveness; PCE = perceived consumer effectiveness; MOD = moderator; MED = mediator

2 Theoretical Perspective on Sustainable Behavior in Consumer Research in General and the Reusage of Products and Reduction of Waste in Particular

Research in consumer behavior enlightens the mechanism behind the consumption cycle and therefore provides insights not only into the pre-purchase and purchase phases, but also into the end of the consumption process: the disposal behaviors. The importance of studying disposal behavior lies in the fact that this particular behavior has an impact on individual consumers, businesses, and the environment. For example, consumers' psychological well-being is directly associated with the elimination of no longer wanted products and the subsequent orderliness of households (Cruz-Cárdenas & Arévalo-Chávez, 2017; Ha-Brookshire & Hodges, 2009). For businesses, disposal behavior is closely related to the purchase of new products, which generates revenue (Cruz-Cárdenas & Arévalo-Chávez, 2017). For the environment, the different ways of disposing of products have a direct effect on, for example, the amount of waste in landfills (Cruz-Cárdenas & Arévalo-Chávez, 2017) and the usage of natural resources (Cooper & Gutowski, 2017).

In their early work, Jacoby, Berning, and Dietvorst (1977) developed a taxonomy of the major disposal behaviors performed by individual consumers and influenced by psychological characteristics of the decision makers (e.g. personality, attitudes, emotions), factors intrinsic to the product (e.g. condition, style), and situational factors (e.g. finances, urgency, fashion changes). The decision-related taxonomy consisted of three main categories: (1) keep the product, (2) get rid of the product temporarily, and (3) get rid of the product permanently. Reusage of products and reduction of waste are central to this taxonomy, for they can be considered as pro-social and pro-environmental behaviors. While reducing waste directly reflects the decrease of the individuals' consumption and, therefore, the decrease in waste generation, reusing a certain product extends its product lifecycle, saving energy and raw materials for disposing of, and producing a new product. This is analog to waste minimization efforts, which advocates that

the absence of waste is the most environmental-friendly and cost-effective way to administer waste.

Efforts of reducing and reusing waste lessen human impact on the environment. Thus, it is of no surprise that major international non-government organizations, such as the United Nations, the World Health Organization, Greenpeace, and the Union of Concerned Scientists, set goals and finance campaigns to reduce waste (Brown & Dacin, 1997; Greenpeace, 2012; United Nations, 2015b; WHO Regional Office for Europe, 2015). The achievement of these goals via effective campaigns takes place at various levels: the macro, the meso and the micro levels (Lorek & Vergragt, 2015). These levels are interconnected and, therefore, in order to have a better understanding of how consumers are influenced to take pro-environmental actions, there is a need to recognize the efforts of all levels. In what follows, the macro, meso, and micro levels of how the context, in which reuse of products and waste reduction behaviors take place, are briefly described.

Macro Level Perspective

At the macro level, organizations of global (or national) societal relevance set incentives for sustainable practices among not only consumers, but also among industries and organizations. This should promote sustainable development in our society. The United Nations defines sustainable development as the “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987, p. 24). The intergovernmental organization has an important role in fighting environmental problems: in 1990 the organization recommended reducing the levels of CO₂, based on its report on climate change and the warning of global temperature rise. Years later, the efforts expanded to other specific areas with the creation of the United Nation’s Millenium Development Goals, a set of eight international development goals

until 2015, one of them (goal 7): “to ensure environmental sustainability” (United Nations, 2015a, p. 7).

In their 2015 Sustainable Development Goals, the United Nations declares sustainable consumption as one of their main goals that appear in several of the seventeen goals for 2030 (United Nations, 2015b). Among these goals, the United Nations highlights the need of making cities sustainable and reducing their environmental impact with regards to air quality and waste management, as well as the importance of establishing sustainable consumption to cut down waste via reducing, reusing and recycling (United Nations, 2015b).

Following the philosophy of the United Nations, the World Health Organization also promotes reducing and reusing waste as part of their program for decreasing carbon footprint and promoting health, claiming environmental and health benefits by doing so (WHO Regional Office for Europe, 2015). Another example of promoting such disposal behavior is seen in the European Union waste legislation with its Waste Framework Directive (WFD) (European Parliament, 2008). The WFD outlines a waste hierarchy, starting with prevention (or reduction) and reuse. The aim is to curtail the volume of waste sent to landfills by avoiding the generation of waste and by using the generated waste as a resource. As these examples show, the macro-level goals aim to influence both meso-level (e.g., production and retail industries) and micro-level actors (individuals).

Meso Level Perspective

At the meso level, a growing number of organizations are committed to the concept of corporate social responsibility in order to contribute to the protection of our environment and help our society to develop. Corporate social responsibility is defined as “reflecting the organization’s status and activities with respect to its perceived societal obligations” (Brown & Dacin, 1997, 68). In other words, the core of corporate social responsibility lies in maintaining

the balance between economic growth and environmental and social protection through pro-social and pro-environmental actions. The engagement of an organization in supporting social and environmental causes has become an essential part of the mission statement of successful organizations (Chernev & Blair, 2015). Although one might think that prolonging a products' lifecycle might result in a decline of revenues of selling new products, businesses engage in reducing consumer waste not only because of the increasing cost of raw materials, but also because of the growing awareness of the need to preserve the environment (Esposito, Tse, & Soufani, 2016). Furthermore, businesses extinguish the feeling of waste by assisting consumers to dispose of products in ways that ensure sustainability. For example, by donating an unwanted product, consumers might have a sense that this product has continuity in usage, instead of being thrown away (Cruz-Cárdenas & Arévalo-Chávez, 2017; Morgan & Birtwistle, 2009).

In the context of reusage of products and reduction of waste, some organizations have started to install programs to reuse and reduce resources. Businesses ranging from apparel to electronics have now programs that encourage consumers to uphold existing products and avoid disposing of functioning products. By doing this, these businesses help prolong products' lifecycles while delivering quality and durability to consumers in exchange for a reputation of being active in the environmental scope (Esposito et al., 2016). These businesses enable consumers to feel that they are effective by promoting such programs.

One example of such business is the medium-sized Swedish denim company Nudie. The company offers customers free denim repair, provides mail-order repair kits and online tutorials, so that customers can fix their jeans themselves, and repurposes unwanted jeans to resell them (Egels-Zandén & Hansson, 2016; Egels-Zandén, Hulthén, & Wulff, 2015; Esposito et al., 2016). This is an example of a campaign that promotes product reusage and waste reduction, which prolongs the products' value to the customers. Another example of product reusage and reduction of waste is the engagement of adidas with its "Sustainable Footprint" shoe-recycling

program in Brazil. Adidas collects used shoes from customers to transform the shredded shoes into fuel. The objective of the program is to minimize the environmental impact of the disposed shoes (Bouzon & Govindan, 2015, 90) while boosting adidas' reputation and image as an environmental-friendly company and increasing their corporate social responsibility (Esposito et al., 2016). These measures of inviting customers to take part in programs to reduce waste and reuse products allow a feeling of effectiveness in sustainable disposal behavior.

Micro Level Perspective

At the micro level, consumers make more or less sustainable decisions at the end of the consumption cycle (Webster, 1975). Consumer-related social responsibility is reflected in "a consumer who takes into account the public consequences of his or her private consumption or who attempts to use his or her purchasing power to bring about social change" (Webster, Jr., 1975, p. 188). These aspects of social change include concerns about reusing products and reducing waste, which are considered to be pro-environmental waste management behaviors, as outlined by Wells, Ponting, and Peattie (2011). Pro-environmental behaviors are influenced by external factors, such as infrastructure, social and cultural factors, and the economic situation, and determined by internal factors, in particular consumers' motivation, values, attitudes, environmental awareness, environmental knowledge, emotional involvement, and locus of control (Kim & Choi, 2005). These factors are also seen in Cruz-Cardenas and Arevalo-Chavez's (2017) model of consumer behavior applied to product disposal, which shows that the consumer's decision making process in disposing a product is motivated by many internal factors (personal and psychological characteristics) and influenced by macro-environmental factors (e.g. economy, culture), micro-environmental factors (e.g. family, groups) and marketing mix instruments (product, price, place, promotion, people, process, physical evidence).

Early literature on sustainable behavior suggests that demographics are determinants of the individuals' behavior with regards to this behavior (Antil, 1984; Berkowitz & Lutterman, 1968; Webster, 1975). Demographics are an important tool for market segmentation and planning communication efforts, and therefore early research in the area of sustainable behavior has focused on establishing the relationship between demographics and pro-environmental behavior (Roberts, 1996). For example, Roberts (1996) found that women, higher education, older people and lower income correlated with environmentally conscious consumer behavior.

Although there are many factors influencing disposal behavior, from the perspective of both human evolution (Griskevicius, Cantú, & Vugt, 2012) and psychology (Kim & Choi, 2005), it is challenging to motivate individuals to change for the good of society at large, such as changing their habits towards a more sustainable direction with regard to reuse of products and reduction of waste. In order to achieve this change in behavior, one should better understand the mechanisms that influence consumers' decision making with regard to the reuse of products and reduction of waste. Among the decision-making influencing factors, self-efficacy perceptions and the resulting consumer effectiveness may play an important role to increase reusing products and reducing waste. In the next chapter, the concept of consumer effectiveness will be introduced and described.

3 From Self-Efficacy to Perceived Consumer Effectiveness

The world is facing environmental issues related, but not exclusive to, waste generation, global warming, and urban air pollution. These problems are rooted in human behavior (Steg, Bolderdijk, Keizer, & Perlaviciute, 2014), and there is a need to change the related human behaviors in order to deal with these problems and advocate better environmental quality. Nevertheless, the question remains on how to motivate individuals to engage in more environmental-friendly behaviors, such as to reuse products and reduce waste.

Even though caring for the environment has become an important aspect of daily life, not many consumers behave in an environmental-friendly manner (Diamantopoulos, Schlegelmilch, Sinkovics, & Bohlen, 2003) and take action to improve their disposal behaviors in a more sustainable way (Kollmuss & Agyeman, 2002; Whitmarsh & O'Neill, 2010). One explanation for this passivity is peoples' different levels of environmental concern derived from their self-efficacy expectation. According to Bandura (1977, p. 193), self-efficacy expectation is "the conviction that one can successfully execute the behavior required to produce the outcomes.". Some people are more likely to take action when they perceive that they can make a difference. This concept of self-efficacy was developed to explain that people's actions depend on one's view that this given action can be effective or not. This ability to think about future consequences supplies motivation for engaging in the specific behavior (Bandura, 1977). This motivation is enhanced through actions that were deemed successful and decreased with failures.

There are four sources from which self-efficacy expectations derive: (1) self-experience; (2) emotional arousal; (3) vicarious experience; and (4) verbal persuasion (Bandura, 1977, pp. 195-200). Self-experience is based on performance accomplishments, in which consecutive successes lead to strong efficacy expectations and diminishes the effect of occasional failures. Example of self-experience sources is participant modeling, in which individuals slowly and repeatedly succeed in tasks that they were previously failing.

The second source of self-efficacy expectations is emotional arousal, explained by Bandura (1977, p. 198): “stressful and taxing situations generally elicit emotional arousal that, depending on the circumstances, might have informative value concerning personal competency.” This informative value is translated as the judgment that individuals have of their physiological arousal. For example, an individual who is tense is more likely to compromise his or her performance and therefore reduce the perceived self-efficacy.

The third source of self-efficacy expectations is the vicarious experience. People are likely to cultivate their self-efficacy expectations via other people’s performances (Bandura, 1977).

Verbal persuasion is the fourth source of self-efficacy expectations. In the context of waste reduction and product reuse, verbal persuasion is the most interesting source of self-efficacy expectations because of its dexterity (ease) and availability for marketers and public policymakers. Via suggestion, people are influenced into believing that they are successful when performing the determined action.

Self-efficacy has influenced one of the main theories in behavioral science: the Theory of Planned Behavior. According to Ajzen (2002, p. 665), behavioral control (“beliefs about the presence of factors that may further or hinder performance of the behavior”), together with behavioral beliefs (“beliefs about the likely consequences or other attributes of the behavior”) and normative beliefs (“beliefs about the normative expectations of other people”), are the main considerations that guide human behavior and therefore might also influence sustainable disposal behavior.

Self-efficacy was first applied in the environmental context by Kinnear, Taylor and Ahmed (1974), who introduced the concept of perceived consumer effectiveness, “a measure of the extent to which a respondent believes that an individual consumer can be effective in pollution abatement” (p. 21). In their early work on a specific pro-environmental behavior (actions to prevent pollution), the authors found that consumers high in perceived effectiveness tend to be

against pollution. Perceived consumer effectiveness further developed and was applied to the context of environmental consciousness (e.g. in relation to energy saving, see Seligman et al., 1979), evolving into “a domain-specific belief that the efforts of an individual can make a difference in the solution to an [environmental] problem” (Ellen, Wiener, & Cobb-Walgren, 1991, p. 103). In other words, perceived consumer effectiveness describes how an individual perceives his or her contribution to specific end goals associated with society and the environment when acting in a certain way.

3.1 Theoretical Perspective on the Relationship between Measured Perceived Consumer Effectiveness and Willingness to Reuse Products and Reduce Waste as well as Hypotheses Development

Many scholars refer to perceived consumer effectiveness as being a context-specific latent variable instead of a long-standing personality trait (Berger & Corbin, 1992; Ellen et al., 1991; Kim & Choi, 2005). Scholars argue that although perceived consumer effectiveness might be related to a more general personality trait (for example, locus of control), the construct can be used in more specific terms in order to understand the given situation (Berger & Corbin, 1992; Kim & Choi, 2005). This situation-specific nature of the construct serves as a basis for better understanding of differences of perceived consumer effectiveness across distinct behaviors. For example, if an individual believes that the reduction of plastic in the ocean can be solved by avoiding the use of plastic bags, then this belief should strongly affect this individual’s willingness to avoid plastic bags, but not the willingness to take part in other environmental-friendly activities. Therefore, situation-specific perceived consumer effectiveness is less helpful in predicting generalized environmental friendly behaviors but more helpful in predicting domain-specific environmental friendly behaviors.

The construct of perceived consumer effectiveness has predictive power for environmental behaviors and therefore distinguishes itself from environmental concerns (Kim & Choi, 2005). While it is not easy to convert environmental concerns into behavior, the strong belief that an action will have a positive outcome on the environment (perceived consumer effectiveness) forecasts environmental behavior. As shown in previous empirical studies, perceived consumer effectiveness predicts different environmental factors, such as socially conscious consumer behaviors (Antil, 1984; Kinnear et al., 1974; Webb, Mohr, & Harris, 2008; Webster, 1975), ecologically conscious consumer behaviors (Roberts, 1996), purchase behaviors (Albayrak, Caber, Moutinho, & Herstein, 2011; Ellen et al., 1991; Kim & Choi, 2005), and environmental attitudes (Kang, Liu, & Kim, 2013; Tan, 2011; Tucker, Rifon, Lee, & Reece, 2012). Furthermore, the high amount of news reports about environmental problems and disasters might reinforce the belief that government and businesses, not individuals, should be responsible for them (Roberts, 1996) and the current portrayal of environmental problems in the media “may be suboptimal for public engagement” (Feldman, Hart, & Milosevic, 2015, p. 14). The suggestive evidence on the changing nature of public opinion on self-efficacy reflects the importance of studying the construct today, in times when environmental concerns are of high importance to countries around the world (Nolan et al., 2018).

Scholars have also taken a different lens when using the perceived consumer effectiveness construct in their studies. For example, Berger and Corbin (1992) investigated the influence of perceived consumer effectiveness on the relationship between environmental concerns and behavioral intentions to explore intention-behavior relations. The authors distinguish attitude and perceived consumer effectiveness by defining attitude as individuals’ overall evaluation of an issue, whilst perceived consumer effectiveness is the evaluation of oneself in the context of the issue (Bergin & Corbin, 1992, p. 80). They apply the construct of perceived consumer effectiveness as a moderator between attitude and behavior. The results

show that perceived consumer effectiveness has a moderating effect on the relationship between environmental concern (attitude) and behavioral intentions in the sense that this relationship is stronger for individuals that perceive their actions as effective in comparison to individuals with low perceived effectiveness. These results were later replicated by Lee and Holden (1999).

The use of perceived consumer effectiveness as a moderator is controversial, as the construct is directly related to self-efficacy, which in turn is embedded in the Theory of Planned Behavior as a predictor, not as a moderator. Therefore, the majority of studies in perceived consumer effectiveness either used the construct as an independent or a mediating variable. For example, perceived consumer effectiveness had been used in the context of culture, as a mediator between the cultural dimension individualism vs. collectivism and environmental commitment (Cho, Thyroff, Rapert, Park, & Lee, 2013); or green purchase behavior (Kim & Choi, 2005). The cultural dimension individualism vs. collectivism describes whether an individual sees himself or herself as a unique individual (individualism) or as part of a group (collectivism) (Hofstede, 2001). According to these studies, in the context of environmental issues, a collectivistic individual will be more likely to think about the good of the group and therefore believes that his or her environmental efforts are effective; whilst an individualistic person will be more prone to act egoistically and thus perceive his or her efforts as irrelevant to make a difference (Cho et al. 2013). In other words, collectivistic individuals (vs. individualistic) perceive higher (vs. lower) consumer effectiveness, which leads to more (vs. less) environmental commitment and green purchase behavior.

The construct of perceived consumer effectiveness can be seen in recent studies that analyze the impact of different types of messages (Antonetti & Maklan, 2014) and positive and negative affect (Coelho et al., 2017) on pro-environmental behavior, and evaluation of organization on message effectiveness (Lee, Haley, & Yang, 2017), all via perceived consumer effectiveness. Antonetti and Maklan (2014) studied the positive effect of messages that enclosed

guilt and pride on perceived consumer effectiveness, which in turn would influence green purchase intentions, showing how guilt and pride can act as regulators of sustainable consumption via perceived consumer effectiveness. Coelho et al. (2017) take a different approach by analyzing how positive and negative subjective experiences of individuals (positive and negative affect) impact perceived consumer effectiveness and, consequently, pro-environmental behavior. According to their results, positive affect positively influences perceived consumer effectiveness, which increases pro-environmental behavior. As for negative affect, the construct had no direct effect on perceived consumer effectiveness, but a direct negative effect on pro-environmental behavior.

These studies provide strong evidence that perceived consumer effectiveness can predict specific environmental friendly behaviors because people tend to take action when they think that it will have an effect on the problem presented. Therefore, individuals that perceive their environmental effectiveness as high will be more likely to have positive attitudes toward the environment and engage in environmental-friendly behavior. In the context of reuse of products and reduction of waste, perceived consumer effectiveness describes consumers' belief that they are effective in reducing waste and the associated environmental and social problems reflected by their own actions. Although previous research has not considered reuse of products and reduction of waste as dependent variables, one can assume that higher perceived consumer effectiveness relates to higher intentions to reuse products and reduce waste. This means that people tend to reuse and reduce more when they think that these actions will have an effect on the problem presented. Based on these arguments, the following hypothesis is proposed:

H1: Perceived consumer effectiveness positively affects the willingness to reuse products and reduce waste.

Study 1 and Study 2 were conducted to investigate the proposed hypothesis. The objective of Study 1 is to explore the relationship between perceived consumer effectiveness and willingness to reuse products and reduce waste. In this study, perceived consumer effectiveness is measured. The objective of Study 2 is to analyze whether primed perceived consumer effectiveness has the same effect as measured perceived consumer effectiveness on the willingness to reuse products and reduce waste. The conception of priming encloses a stimulus that activate mental constructs without conscious realization (Weingarten et al., 2016) and therefore it induces a state of mind of high (or low) perceived consumer effectiveness that will consequently have a positive (negative) effect on willingness to reuse products and reduce waste.

3.1 Empirical Evidence: Study 1

Study 1 was conducted to assess the relationship between perceived consumer effectiveness and willingness to reuse products and reduce waste. In this study, both variables were measured in order to establish the relationship between these constructs.

3.1.1 Method

Participants

Two hundred and fifty-two (111 female) individuals participated in the study and all lived in the US with an age range from 18 to 73 years old ($M = 37.86$, $SD = 12.03$). Table 2 shows a detailed overview of the convenience sample collected in Study 1 from an online platform.

Procedure

The study assessed the two continuous variables via a survey. In order to analyze whether perceived consumer effectiveness has an impact on willingness to reuse products and reduce waste, an online questionnaire via mTurk was administered. Participants answered questions

related to perceived consumer effectiveness and behavioral intentions with regard to waste reduction and product reusage and received \$0.70 for their participation.

Table 2: Demographics of the Participants of Study 1

Gender			Income (Yearly Gross per Household)		
Male	141	(55.95%)	< \$25,000	63	(25.00%)
Female	111	(44.05%)	\$25,000 - \$49,999	78	(30.95%)
Total	252	(100.00%)	\$50,000 - \$74,999	57	(22.62%)
			≥ \$75,000	54	(22.62%)
Age			Marital Status		
18-25 years	28	(11.16%)	Single	117	(46.43%)
26-35 years	109	(43.43%)	Married	97	(38.49%)
36-45 years	55	(21.91%)	Separated	3	(1.19%)
46-55 years	30	(11.95%)	Widowed	5	(1.98%)
>55 years	29	(11.51%)	Divorced	30	(11.90%)
Household Size			Education Level		
1	66	(26.19%)	Did not complete High School	5	(1.98%)
2	83	(32.94%)	High School/GED	25	(9.92%)
3	45	(17.86%)	Some College	85	(33.73%)
4	35	(13.89%)	Bachelor's Degree	86	(34.13%)
5	14	(5.56%)	Master's Degree	41	(16.27%)
≥6	9	(3.57%)	Advanced Graduate/Ph.D.	10	(3.97%)

Measures

Perceived consumer effectiveness was measured with four items on a 5-point scale from strongly disagree – 1 – to strongly agree – 5. The items were based on Roberts (1996; see Appendix B) and the scale was reliable with a Cronbach's alpha of .88. Example of items: "I can do a lot to reduce the impact of pollution". Perceived consumer effectiveness was found to be a valid construct in previous research (Kinnear et al., 1974; Roberts, 1996; Webster, 1975).

Intention to reuse products and reduce waste was measured with ten items in a 5-point rating scale from 1 – very unwilling to 5 – very willing (Barr, Gilg, & Ford, 2001; see Appendix A for all items and descriptive statistics). The scale had a Cronbach's alpha of .93 and participants

were asked to rate their willingness to take different actions related to reducing waste and reusing product (“Please rate how willing you are to take the following action”). Examples of items are: “Buying certain products without packaging, like fruit and vegetables” and “Repairing items before deciding they have to be thrown away.” Evidence for the validity of this scale is reported by Barr, Gilg, and Ford (2001).

3.1.2 Results

Regression

In order to analyze whether perceived consumer effectiveness positively influences the willingness to reuse products and reduce waste, a linear regression was performed. As expected, perceived consumer effectiveness predicted the willingness to reuse products and reduce waste ($b = .63$, $SE = .05$, $p < .001$) and this effect was positive and significant. This means that the higher the perceived consumer effectiveness, the higher is the willingness to reuse products and reduce waste. Perceived consumer effectiveness explained a significant proportion of variance in the scores of willingness to reuse products and reduce waste, $R^2 = .39$, $F(1, 252) = 163.79$, $p < .001$.

Study 1 adds to the research on perceived consumer effectiveness, in which the results indicate that there is a positive relationship between perceived consumer effectiveness and willingness to reuse products and reduce waste. Similar to previous research on perceived consumer effectiveness and environmental behavior (Albayrak et al., 2011; Ellen et al., 1991; Kim & Choi, 2005), the results confirm the power of prediction of perceived consumer effectiveness on disposal-related behavioral intentions.

Demographics

In order to assess whether demographics have an impact on sustainable behavioral intentions and whether the positive effect of perceived consumer effectiveness is upheld controlling for demographics, regression using age, gender, educational level, and income as well as perceived consumer effectiveness was conducted. Gender ($b = .05$, $SE = .08$, $p = .51$) and income ($b = .02$, $SE = .04$, $p = .61$) had no effect on the behavioral intentions. As for educational level, three dummy variables were constructed that represented four levels of education: no high school, high school, some college/bachelor's and master/Ph.D. groups. The dummy coding designated the master/Ph.D. as the reference group. There was only one negative and significant effect of high school ($b = -.42$, $SE = .16$, $p < .05$), indicating that individuals with high school had lower levels of willingness to reuse products and reduce waste (relative to the master/Ph.D. group). Age was also found to be a predictor of waste reduction and products reuse ($b = .007$, $SE = .003$, $p < .05$). Older individuals scored higher on the dependent measure. Perceived consumer effectiveness had a positive and significant effect on the behavioral intentions ($b = .60$, $SE = .05$, $p < .001$). The R^2 was 43%, which means that the percentage of the variance of intentions of waste reduction and product reuse is explained by perceived consumer effectiveness, age and educational level (of high school in reference to the master/Ph.D. group).

3.2 Empirical Evidence: Study 2

Whilst Study 1 evaluated the influence of measured perceived consumer effectiveness on willingness to reuse products and reduce waste; Study 2 assesses this relationship by priming participants into high and low perceived consumer effectiveness. The mechanism is expected to function similarly in these two studies: perceived consumer effectiveness will have a positive effect on willingness to reuse products and reduce waste disposal behavior, independently of

measuring (Study 1) or priming (Study 2) perceived consumer effectiveness. This study evaluates whether supraliminal primed perceived consumer effectiveness can have an impact on the intentions of engaging in environmental friendly disposal behavior.

Additionally, this study evaluated whether primed perceived consumer effectiveness has an impact on actual behavior, measuring participants' behavior regarding energy conservation. Energy conservation and product reuse and waste reduction can be seen as directly and indirectly, respectively, as resource conservation. Individuals conserve resources directly by, for example, turning off the lights, or conserve resources indirectly by reducing waste and reusing products, so that the resources used to manufacture a new product are also preserved. Therefore, this study also assesses whether priming perceived consumer effectiveness influences energy conservation.

3.2.1 Method

Participants

There was a total of 185 participants, with ages ranging from 18 to 32 years old ($M = 21.89$, $SD = 21.90$), 121 were female (65%) and all respondents resided in Germany. A convenience sampling technique was applied and participants were mainly students and employees at the Technische Universität München. Table 3 gives a detailed overview of the sample collected in Study 2.

Procedure

Participants were recruited via e-mail and personally by the researcher in between classes. They were invited to the computer lab with the pretext of taking part in a water testing experiment. Upon arrival, they signed the consent form for participation and were asked to draw a number (from 1 to 8) that corresponded to one of the eight computers in the lab. Apart from the computer, each place had three water bottles labeled with the numbers 1, 2 and 3 and ten

small plastic cups. There was a sign which stated that participants should not touch the water bottles and cups until asked to do so. Participants were instructed to start with the computer-based questionnaire once they were settled at the assigned computer.

Table 3: Demographics of the Participants of Study 2

		Gender			
	Male	64	(34.59%)		
	Female	121	(65.41%)		
	Total	185	(100.00%)		
Age		Education Level			
18-20 years	60	(32.43%)	High School	154	(83.24%)
21-25 years	106	(57.30%)	Bachelor's Degree	25	(13.51%)
≥26 years	19	(10.27%)	Master's Degree	5	(2.70%)
			Advanced Graduate/Ph.D.	1	(0.55%)

The study used an experimental design with two randomly assigned conditions (high versus low perceived consumer effectiveness). The questionnaire started with a few demographic questions (age, gender, educational level) and continued with the priming of perceived consumer effectiveness with three sentence scramble tasks. Priming refers to “the preparedness of mental representations to serve a response function.” (Bargh & Chartrand, 2014, p. 3). In this study, priming perceived consumer effectiveness has the objective to temporarily activate an individual’s perceived effectiveness towards the environment to further investigate its consequences on this individual’s actions (waste reduction and product reusage). As sentence scramble tasks can produce priming effects (Bargh & Chartrand, 2014), these tasks were chosen for the priming.

Participants were instructed to solve the given sentence scramble tasks to ensure their attention by putting the sentences in the right order (“In order to ensure your attention, we would like you to complete different sentence scramble tasks.”). These sentences were created based

on the perceived consumer effectiveness items from Roberts (1996; see Appendix C – respectively related to high or low perceived consumer effectiveness; example: “I can/cannot do a lot to help the environment.”). There was no mention of the content importance of the sentences, making sure that participants did not identify any connection with the sentence tasks and the rest of the survey.

Once finished with the tasks, participants were asked to go to the toilet to wash their hands before touching the water bottles as a hygiene measure and courtesy to future participants. By raising their hands, they were escorted outside the lab by the researcher, who indicated where the toilet was. For additional analysis and unknown to participants, a research assistant was waiting outside the toilet and noted down whether the lights were left on or switched off when participants left the toilet (i.e., indicators of the actual behavior of resource conservation, or a lack of thereof). A sign was posted inside the toilet with the phrase: “Please turn off the lights when leaving the toilet” and the research assistant ensured that the light was off when the next participant entered the toilet. Studies which include actual behavior are important in order to assess the practical significance of behavioral research (Rundle-Thiele, 2009).

After coming back from the toilet, participants were instructed to try water number 1 and were asked filler questions about the taste of the water (e.g., “The water was refreshing” on a scale from 1 – strongly disagree – to 5 – strongly agree). The same procedure followed for water number 2 and water number 3. Participants reached the end of the experiment and were allowed to leave the room to collect their participation reward (USB power bank).

Measures

One manipulation check-related variable and the same questions about waste disposal-related behavioral intentions (Barr et al. 2010; Cronbach’s alpha = .81; see Appendix A) from Study 1 were asked. For the manipulation check, participants answered on a 5-point rating scale

with the anchors: “I cannot do much for the environment” vs. “I can do a lot for the environment”. A higher score would indicate high perceived consumer effectiveness, whereas a lower score would indicate low perceived consumer effectiveness.

3.2.2 Results

Manipulation check

As expected, participants in the high perceived consumer effectiveness condition ($N = 82$, $M = 4.82$, $SD = .52$) rated this question higher than participants in the low consumer effectiveness condition ($N = 103$, $M = 1.35$, $SD = .95$; $t(183) = -31.59$, $p < .001$). This indicates that perceived consumer effectiveness was primed into low and high.

Regression

As in Study 1, a single linear regression analysis was performed to predict willingness to reuse products and reduce waste based on primed perceived consumer effectiveness. Similar to the results from Study 1, primed perceived consumer effectiveness predicted the willingness to reuse products and reduce waste and this effect was positive and significant, $b = .23$, $SE = .09$, $p < .05$. This means that primed high perceived consumer effectiveness led to higher willingness to reuse products and reduce waste. Primed perceived consumer effectiveness explained a proportion of variance in the scores of willingness to reuse products and reduce waste, $R^2 = .03$, $F(1, 183) = 6.35$, $p < .05$.

Demographics

Regressions using age, gender, and educational level as well as primed perceived consumer effectiveness were conducted to investigate whether demographics have an impact on waste reduction and reuse. Age had no effect on disposal behavior ($b = .03$, $SE = .02$, $p = .20$). Gender was found to be a significant predictor of waste reduction and reuse, which means that women scored higher on the dependent measure ($b = .24$, $SE = .10$, $p < .05$). As for educational level, two dummy variables were constructed that represented three levels of

education: high school, some college/bachelor's and master/Ph.D. groups, with the latter as the reference group. There was only a positive and marginal significant effect of bachelor's degree ($b = .52, SE = .29, p = .07$), indicating that individuals with bachelor's degree had higher levels of willingness to reuse products and reduce waste (relative to the master/Ph.D. group). Primed perceived consumer effectiveness had a positive and significant effect on disposal behavioral intentions ($b = .21, SE = .09, p < .05$). The R^2 was 12%, which means that this percentage of the variance of waste reduction and reuse is explained by primed perceived consumer effectiveness, gender and educational level (bachelor's degree).

Energy conservation behavior

In order to analyze the effect of primed perceived consumer effectiveness on actual sustainable behavior, here energy conservation, a chi-square test of independence was calculated comparing the frequency of the lights switched on and off in both groups: low and high perceived consumer effectiveness. For both low and high perceived consumer effectiveness groups, the percentage of participants that left the lights on was higher than those who turned off the lights (see Table 4). Nevertheless, no significant relationship was found between the type of priming and the frequency of lights on and off, $\chi^2(1, 184) = 0.31, p = .84$, rejecting the hypothesis that perceived consumer effectiveness influences energy conservation.

Table 4: Percentage of Lights On and Off for the Experimental Conditions

	Low PCE	High PCE
Lights on	51.5%	55.6%
Lights off	48.5%	44.4%

Note. PCE = perceived consumer effectiveness.

3.3 Discussion of Studies 1 and 2

The main objective of Study 1 and Study 2 was to assess the influence of perceived consumer effectiveness on willingness to reuse products and reduce waste. Perceived consumer effectiveness – with regards to the environment – is an individual conviction which was measured in Study 1. The results of Study 1 show evidence that measured perceived consumer effectiveness has a positive and significant effect on willingness to reuse products and reduce waste: the higher an individual perceives himself or herself as being effective in environmental issues, the higher he or she is likely to take actions on reducing waste and reusing products. These results confirm previous environmental research which indicates that perceived consumer effectiveness has a positive impact on environmental issues (e.g., environmental attitude in Kang et al., 2013; Tan, 2011; Tucker et al., 2012).

In Study 2, perceived consumer effectiveness was primed to temporarily activate a high or a low effectiveness mindset. The results of Study 2 show that primed perceived consumer effectiveness has a positive and significant impact on willingness to reuse products and reduce waste. Individuals in a high (vs. low) effectiveness mindset were more likely to reuse products and reduce waste. These results were similar to Study 1, meaning that both primed and measured perceived consumer effectiveness have a positive influence on individuals' inclination of reducing waste and reusing products.

In addition to these results, Study 2 measured actual environmental friendly behavior, here energy conservation, by observing whether participants left the lights on or turned them off when leaving the toilet. Although an effect of primed perceived consumer effectiveness on energy conservation was expected (the higher the perceived consumer effectiveness, the more likely the participant would be to turn off the light), no such effect could be observed. One plausible explanation can be put forward for this lack of effect. Although there was a significant effect of primed perceived consumer effectiveness on the intention of reducing waste and

reusing products, there was no significant effect of the construct on energy conservation behavior. This is explained by the domain-specific nature of perceived consumer effectiveness, which states that the construct might predict certain behaviors but fail to predict others. This might lie in the fact that although both dependent variables (willingness to reuse products and reduce waste, and turning out the lights) are directly related to resource conservation, they are fundamentally different. Behaviors of reducing waste and reusing products entail the existence of a tangible object, whilst energy conservation has a more intangible nature, as it is difficult to touch energy. Also, habits may have influenced actual behavior more than behavioral intentions.

As for demographics, results showed that Study 1 indicated that age and educational level (high school) influenced waste reuse and reduction, whilst Study 2 found a significant result for gender and educational level (some college/bachelor's). Although the results are in line with previous environmental research stating that education, income and gender might be determinants of environmental behavior (Antil, 1984; Berkowitz & Lutterman, 1968; Meyer, 2015; Webster, 1975), both studies did not show consistent effects concerning demographics. This could occur because of the samples being drawn from different populations (mTurk database and students). Nevertheless, both studies showed that even when controlling for demographics, measured and primed perceived consumer effectiveness had a positive and significant effect on willingness to reuse products and reduce waste.

In summary, Study 1 and Study 2 provide initial empirical support for the proposed hypothesis, supporting that perceived consumer effectiveness has a positive effect on willingness to reuse products and reduce waste. The results of both studies confirm previous research on the influence of perceived consumer effectiveness on environmental issues (Kang et al., 2013; Tan, 2011; Tucker et al., 2012; Webb et al., 2008), and indicate that the construct is not only influenced by one's perception but is also a state of mind that can be activated temporarily.

Nevertheless, the priming of perceived consumer effectiveness suggests that even individuals that have low effectiveness can be activated temporarily in a high effectiveness mindset. Although there was no measurement of such claim (measuring perceived consumer effectiveness before the priming), this could implicate that supraliminal messages of effectiveness lead to the likelihood of individuals engaging in environmental friendly disposal behavior.

One general implication of these results is that environmental friendly marketing and social campaigns should target perceived consumer effectiveness and use it as a tool in order to influence people's willingness to reuse products and reduce waste. However, implementing supraliminal messages of effectiveness in environmental campaigns involves a high level of complexity. Nonetheless, there is the possibility of informing individuals of their consumer effectiveness. In the next section, the use of perceived consumer effectiveness in communication is addressed.

4 Informed Consumer Effectiveness

In Study 2, priming perceived consumer effectiveness had the objective to temporarily activate an individual's perceived effectiveness towards the environment to further investigate its consequences on this individual's actions (waste reduction and product reuse). Priming has a temporary nature, and therefore although it might subsequently lead participants to the desired outcome, this might not be sustained over an extended period. On the other hand, consciously informing people of their consumer effectiveness might have longer effects, not only for the desired outcome, but also for antecedents of the behavior, such as willingness to engage or even awareness of the given subject.

4.1 Theoretical Perspective on the Relationship between Informed Consumer

Effectiveness in the Context of Environmental Advertising and Willingness to Reuse Products and Reduce Waste as well as Hypotheses Development

How can perceived consumer effectiveness be used in communication? Verbal persuasion is one important source of both self-efficacy (Bandura, 1977) and perceived consumer effectiveness, for the reason that verbally communicating that an individual can be successful strengthens his or her belief of mastering the targeted behavior effectively. Therefore, the most accessible approach of implementing perceived consumer effectiveness in communication is via a medium that includes verbal content. For example, an informative message on a billboard, magazine or even internet with a message stressing the potential benefits of individual efforts for the environment.

Information provision is one important environmental regulation which is dependent on consumers' reaction towards the disseminated information. In other words, information provision has an indirect nature: it relies on individuals changing their consumption because of the provided information. This approach has "often been seen as a regulatory experiment rather than

as a regulatory instrument” (Krarup et al., 2005, p. 5). Traditionally, there are three types of environmental regulations: (1) command-and-control approach; (2) market-based instrument approach; and (3) information provision (Krarup et al., 2005; Tietenberg & Wheeler, 2001).

The command-and-control policies are used when regulatory agencies give specific orders of what and how individuals have to do to solve an environmental problem. The command-and-control approach is characterized by having a regulatory authority specifying a diverse set of policies.

The market-based instrument approach is less restrictive, as it gives individuals an incentive for behaving environmentally instead of obligating them. An example of a market-based approach is the deposit ‘Pfand’ system in Germany, in which consumers pay a deposit for the bottle and receive this money back when returning it.

Although all three approaches are common in environmental regulation, information provision is the most common approach because it is not bound to heavy regulations and therefore also used by other institutions, such as nonprofit organizations. However, unlike the direct and objective outcomes that the command-and-control and market-based instrument approaches deliver, information provision depends on the indirect process of individuals receiving a message and consequently changing their behavior. Thus, there is a need to understand how to better provide information to consumers in order to affect their behavior.

In general, nonprofit organizations’ campaigns widely adopt the use of shock advertising (Parry, Jones, Stern, & Robinson, 2013; West & Sargeant, 2004) instead of informing individuals of their positive impact when changing their behavior. Shock advertising is regarded as an advertisement that purposely offends and upsets its audience via norm violation (Dahl, Frankenberger, & Manchanda, 2003). This tactic is used based on the premise that shock advertisement increases attention and awareness via emotions, and subsequently influences changes in behavior and attitudes (Parry et al., 2013). Although it can be argued that it increases

attention and awareness, there are a few disadvantages of using shock advertising. The frequent use of this type of advertisement might contribute to compassion fatigue, leading the audience to become indifferent to such appeals (Cockrill & Parsonage, 2016). Moreover, shock advertising does not give guidance on how to change behavior and attitudes and whether these changes will have an impact on the given problem.

The latter is addressed by using information appeal, which has the objective of informing about the subject and does not rely on offense to influence and promote behavior change. In the environmental field, information appeal has been commonly used to address problems such as climate change and green gas emissions (Bulkeley, Paterson, & Stripple, 2016). One advantage of this type of campaign is that environmental fact is the most acceptable type of claim (Carlson, Grove, & Kangun, 1993) and seen as the least deceptive. Nevertheless, there is a lack of evidence that indicates that factual information alone is a successful mean to promote behavioral change for the benefit of the environment (Ölander & Thøgersen, 2014). In order to encourage this change, the information appeal should not only inform about the environmental problem, but also stress the capability of every single individual to battle the given problem, as such knowledge contributes to sustainable and eco-friendly behaviors (Coelho, Pereira, Cruz, Simões, & Barata, 2017; Roberts, 1996).

Although there is a common general agreement of a need to understand how different types of messages and communication can influence environmental-friendly disposal behavior (Cruz-Cárdenas & Arévalo-Chávez, 2017, 13), there are not many studies that analyze the direct implementation of consumer effectiveness in communication and messages with regards to waste reduction and reuse. There have been attempts to analyze the use of perceived consumer effectiveness as a function of messages that indicated individuals' effectiveness of energy conservation (Allen 1982) and recycling behavior (Lord & Putrevu 1998), respectively. These studies indicated that perceived consumer effectiveness in messages is likely to have an

impact on perceived consumer effectiveness, which in turn has a positive impact on the desired behavior.

Therefore, informing consumers about their effectiveness might influence the targeted behavior, as it encourages consumers to be proactive by demonstrating the possible positive outcome of their actions. The expected effects of informed consumer effectiveness are likely similar to perceived consumer effectiveness: the higher the consumer effectiveness, the more susceptible this consumer is to take action. Based on these arguments, the following hypothesis is proposed:

H2: Informed consumer effectiveness positively affects the willingness to reuse products and reduce waste.

4.2 Empirical Evidence: Study 3

With the purpose of further investigating the role of informed consumer effectiveness on disposal behavior, Study 3 uses the approach of informing participants of consumer effectiveness in reducing and reusing waste, as verbal persuasion is one of the main sources of efficacy information (Bandura, 1977). Participants were randomly assigned and exposed to one of two texts reporting information on high or low informed consumer effectiveness.

4.2.1 Method

Participants

There were a total of 176 participants ranging from age 17 to 79 (mean age = 34.00, $SD = 14.27$) and 79 were female (44.90%). A convenience sampling technique was applied, in which participants were selected for their accessibility and proximity to the researcher. The following table (Table 5) summarizes the characteristics of the sample for this study.

Table 5: Demographics of the Participants of Study 3

Gender			Income (Yearly Gross per Household)		
Male	97	(55.10%)	<R\$25,000	97	(55.10%)
Female	79	(44.90%)	R\$25,000-R\$49,999	35	(19.90%)
Total	176	(100.00%)	R\$50,000-R\$74,999	14	(8.00%)
			≥R\$75,000	26	(14.70%)

Age			Marital Status		
17-29 years	85	(48.29%)	Single	110	(62.50%)
30-39 years	40	(22.72%)	Married	46	(26.10%)
40-49 years	19	(11.10%)	Separated	4	(2.30%)
50-59 years	19	(11.10%)	Widowed	1	(0.60%)
60-79 years	13	(7.38%)	Divorced	15	(8.50%)

Household Size			Education Level		
1	27	(15.30%)	High School/GED	5	(2.80%)
2	46	(26.10%)	Some College	68	(38.60%)
3	39	(22.20%)	Bachelor's Degree	81	(46.00%)
4	35	(19.90%)	Master's Degree	17	(9.70%)
≥5	27	(15.40%)	Advanced Graduate/Ph.D.	4	(2.30%)

Procedure

A paper-and-pen questionnaire was administered in Brazil. In order to analyze whether informed consumer effectiveness has an impact on willingness to reuse products and reduce waste, participants were randomly assigned to high or low informed consumer effectiveness conditions and answered questions related to waste reduction and product reuse intentions.

Manipulation

Two conditions were created based on the work of Lord and Putrevu (1998), who operationalized perceived consumer effectiveness stressing the positive consequences of disposing correctly (high perceived consumer effectiveness) and negative consequences of disposing incorrectly (low perceived consumer effectiveness). Participants were randomly assigned and exposed to one of the two texts representing the two different conditions (see Appendix D): high perceived consumer effectiveness and a control/baseline condition of low perceived consumer effectiveness. Coelho, Pereira, Cruz, Simões, and Barata (2017) suggest

that the adoption of perceived consumer effectiveness in marketing communication should involve assuring that “individual efforts have powerful collective impacts”. Therefore, in the high informed consumer effectiveness text, with the title “Consumers are highly effective in producing less waste”, participants read that consumers are the main contributors and very effective in reducing waste. In the low informed consumer effectiveness text, entitled “Consumers are highly ineffective in producing less waste”, participants were informed that despite efforts, consumers are not effective in reducing waste. After reading the press release, participants answered questions about their intentions to reuse products and reduce waste and demographics.

Measures

Intentions to reuse products and reduce waste were measured with the same scale from previous studies (Study 1 and Study 2; Barr et al., 2001; Appendix A) and the scale was reliable with a Cronbach’s alpha of .84. In order to check whether the press release differed as high and low perceived effectiveness, perceived consumer effectiveness was assessed with the same four items from Study 1 (Cronbach’s alpha = .77; based on Roberts, 1996)¹.

4.2.2 Results

Manipulation check

A t-test for independent means was conducted comparing the high and low perceived consumer effectiveness press releases’ groups on informed consumer effectiveness. The analysis was significant, $t(174) = -2.55$, $p < .05$, $d = .39$, which suggests that, as expected, those

¹ Composite reliability for perceived consumer effectiveness = .86; composite reliability for willingness to reuse products and reduce waste = .87; average variance extracted for perceived consumer effectiveness = .61; average variance extracted for willingness to reduce and reuse waste = .41; squared correlation = .11. The thresholds of .6 was used for composite reliability (Bagozzi & Yi, 1988), .5 for average variance extracted was used for convergent validity and <1 for the Fornell and Larcker criterion for discriminant validity (ratio of highest squared correlation of a construct to AVE of the construct; Fornell & Larcker, 1981).

in the high informed effectiveness group ($M = 4.17$, $SD = .58$) scored higher on perceived consumer effectiveness than those in the low informed effectiveness group ($M = 3.90$, $SD = .84$).

Regression

A single linear regression analysis was conducted to predict willingness to reuse products and reduce waste based on informed consumer effectiveness. Informed consumer effectiveness had a negative and marginal significant effect on willingness to reuse products and reduce waste ($b = -.19$, $SE = .11$, $p = .07$). This means that informed high (low) perceived consumer effectiveness leads to lower (higher) willingness to reuse products and reduce waste. Informed consumer effectiveness explained a small proportion of variance in the scores of willingness to reuse products and reduce waste, $R^2 = .02$, $F(1, 174) = 3.23$, $p = .07$.

Demographics

Regressions using age, gender, educational level, and income, as well as informed consumer effectiveness were conducted to investigate whether demographics have an impact on waste reduction and reusage. In order to include educational level in the regression, two dummy variables were constructed to represent three levels of education: high school, some college/bachelor's and master/Ph.D. groups, with the latter as the reference group. There were no significant results of demographics and informed consumer effectiveness on willingness to reuse products and reduce waste ($R^2 = .06$, $F(6, 165) = 1.82$, $p = .09$), most likely due to the overspecification of the model. For comparability reasons, the coefficients for the predictors are reported; they are as follows: age ($b = .005$, $SE = .004$, $p = .19$), income ($b = .04$, $SE = .05$, $p = .41$), gender ($b = .16$, $SE = .11$, $p = .15$), educational level (high school: $b = -.54$, $SE = .39$, $p = .17$; some college/bachelor's: $b = -.19$, $SE = .17$, $p = .28$) and informed consumer effectiveness ($b = -.18$, $SE = .11$, $p = .10$).

4.2.3 Discussion

The objective of Study 3 was to investigate the role of informed consumer effectiveness on willingness to reuse products and reduce waste. A press release was used to inform individuals of their high effectiveness, whilst other press release informed participants of their low effectiveness. The results suggest a negative influence of informed consumer effectiveness on willingness to reuse products and reduce waste: the higher (lower) the perceived effectiveness, the less (more) likely an individual would take part in environmental friendly disposal behavior.

This finding contradicts the general literature on the positive influence of perceived consumer effectiveness on environmental issues and also the results of Study 1 and Study 2, which respectively measured and primed the effectiveness' construct. The main difference between all three studies was the method of measuring, priming and informing consumer effectiveness, whilst the dependent variable of willingness to reuse products and reduce waste was kept constant. This leads to the belief that the negative effect was produced by informing participants of their effectiveness.

One possible explanation for this effect is that the manipulation of low perceived consumer effectiveness caused participants to feel a negative discrepancy between their performance (when reading about how consumers are ineffective in waste reduction and reusage) and their perceived behavior, creating dissatisfactions that motivate adjustment in behavior. This phenomenon was already stated by Bandura (1977, p. 193), in which the author affirms that: "Both the anticipated satisfaction of desired accomplishments and the negative appraisals of insufficient performance (thus) provide incentives for action.". Therefore, participants in the low perceived consumer effectiveness condition were more likely to indicate a higher willingness to reuse products and reduce waste as their corrective approach for their dissatisfaction with their ineffectiveness.

This phenomena of feeling discomfort and the pressure to reduce this discomfort have been previously studied by Festinger (1957), who developed the Theory of Cognitive Dissonance. In order to understand how cognitive dissonance might explain the negative relationship between informed consumer effectiveness and willingness to reuse products and reduce waste, the next chapter focuses on the Theory of Cognitive Dissonance, appraisal, and negative emotions.

5 Cognitive Dissonance, Appraisal Theory and Negative Emotion

The Theory of Cognitive Dissonance states that dissonance between cognitive elements leads to feelings of discomfort, which prompts action to reduce this psychological discomfort (Festinger, 1957). These elements refer to “what a person knows about himself, about his behavior, and about his surroundings.” (Festinger, 1957, p. 9). In other words, they represent everything that an individual knows about himself or herself (beliefs, attitudes, values, feelings) and about the world in which he or she lives. The dissonance between two elements leads to an individual being psychologically uncomfortable. This dissonance is also prompted when individuals are introduced to information which is not consistent with their own beliefs or attitudes (Harmon-Jones, 2000).

Cognitive dissonance produces a negative state (Elliot et al., 1994; Harmon-Jones, 2000, 2004; Zanna & Cooper, 1974), which pressures the individual to seek consonance. Festinger (1957) compares this with when an individual in a state of hunger, a feeling of discomfort caused by lack of food, acts to reduce this hunger. This explains the motivational aspect of the theory of cognitive dissonance, as the discomfort between two cognitions motivates action to reduce it.

Cognitions are antecedents of emotions, and therefore cognitive dissonance involves the cognitive discrepancy resulted by appraisals, which elicit negative emotion (Harmon-Jones, 2000). For example, if an individual is exposed to information which is dissonant to his or her own beliefs, values and attitudes, negative emotion results which prompts discrepancy reduction. Thus, the motivation of reducing cognitive dissonance derives from the need to reduce this negative emotion (Harmon-Jones, 2000).

In the context of environmental-friendly disposal behavior, individuals strive for maintaining cognitive balance: they appreciate the fact that they do something to protect the environment, and this cognitive balance can make them less likely to act in a pro-environmental

friendly manner, because they feel that they already contribute to this goal. In addition, if the cognitive balance is distorted (such as by a persuasive message that questions their contribution), negative emotions can act as a motivator to engage in environmental friendly disposal behavior, because consumers aim to avoid the feeling of not doing enough to protect the environment (Antonetti & Maklan, 2014; Theotokis & Manganari, 2015). In summary, individuals that experience the negative affect of cognitive discrepancy are motivated to resolve this discrepancy. In order to understand how appraisals elicit this negative affect (emotion), there is a need to consider the arguments based on Appraisal Theory.

The essence of Appraisal Theory is “the claim that emotions are elicited by evaluations (appraisals) of events and situations” (Roseman & Smith, 2001, p. 3). In other words, an individual experiences and appraises an event and respond to it through certain emotions. The focus are the evaluations and interpretations of events and not the events per se (Roseman, Spindel, & Jose, 1990), as individuals might experience different emotions from the same event because of their different evaluations of this event. Through appraisals, one can understand which particular emotions are evoked.

Researchers have consistently found evidence of main appraisals’ dimensions (Moors, Ellsworth, Scherer, & Frijda, 2013; Roseman, 1996; Roseman et al., 1990; Roseman & Smith, 2001; Scherer, 2005): situational state, probability, legitimacy, agency, power, and motivational state. In what follows, these dimensions are briefly described.

Situational state refers to whether events are consistent or inconsistent with an individual’s motives (Roseman, 1996; Roseman et al., 1990). While an appraisal of motive that is consistent generates a positive emotion (e.g., hope); an appraisal of a motive that is inconsistent generates a negative emotion (e.g., fear).

Probability appraisal expresses the certainty or uncertainty of the outcomes: certain outcomes prompt emotions such as joy and sadness, uncertain outcomes prompt emotions such as hope and fear (Roseman, 1996; Roseman et al., 1990).

Legitimacy or problem source appraisal refers to whether an event is attributed as being positively or negatively deserved (Roseman, 1996; Roseman et al., 1990).

Agency relates to the ascription of responsibility for the event: if the event was caused by circumstances beyond anyone's control, caused by someone else, or caused by oneself (Roseman, 1996; Roseman et al., 1990). For example, appraisal of agency can elicit emotions such as guilt (caused by oneself), anger (caused by another person), and sadness (caused by other circumstances).

The appraisal of power indicates whether the perceptions of oneself is weak or strong (Roseman, 1996; Roseman et al., 1990). While perceiving oneself as strong elicit emotions such as anger, perceiving oneself as weak causes emotions such as sadness.

Motivational state appraisal refers to the motive consistency or inconsistency regarding gaining reward (appetitive motivation) or avoiding punishment (aversive motivation) (Roseman, 1996; Roseman et al., 1990). When the motive is consistent with gaining rewards, the event elicits emotions such as joy. Contrariwise, when the motive is inconsistent with gaining rewards, the event evokes emotions such as sadness. Events consistent with avoiding punishment elicit emotions such as relief, while events inconsistent with avoiding punishment elicit emotions such as distress.

Depending on the individuals' appraisals of situational state, probability, legitimacy, agency, power, and motivational state, certain emotions are evoked. Emotion is defined as "a mental state" (Cabanac, 2002, p. 70) and "a verdict about an object or a state of affairs and thus it is a reason for action" (Zemach, 2001, p. 197). Roseman et al.'s (1990) primary emotions attributed to appraisals are depicted in Table 6.

Table 6: Primary Emotions Based on Appraisals

	Positive Emotions Motive-consistent		Negative Emotions Motive-inconsistent		
	Appetitive	Aversive	Appetitive	Aversive	
Circumstance-caused					
<i>Unknown</i>			Surprise		
<i>Uncertain</i>		Hope		Fear	
<i>Certain</i>	Joy	Relief	Sadness	Distress, Disgust	<i>Weak</i>
<i>Uncertain</i>		Hope		Frustration	
<i>Certain</i>	Joy	Relief			<i>Strong</i>
Other-caused					
<i>Uncertain</i>				Dislike	<i>Weak</i>
<i>Certain</i>		Liking			
<i>Uncertain</i>				Anger	<i>Strong</i>
<i>Certain</i>					
Self-caused					
<i>Uncertain</i>				Shame, Guilt	<i>Weak</i>
<i>Certain</i>		Pride			
<i>Uncertain</i>				Regret	<i>Strong</i>
<i>Certain</i>					

Note. Adapted from “Appraisals of emotion-eliciting events: Testing a theory of discrete emotions,” by I. Roseman, M. Spindel and P. Jose, 1990, *Journal of Personality and Social Psychology*, 59, p. 901. Copyright 1990 by the American Psychological Association.

5.1 The Theory of Cognitive Dissonance and Appraisal Theory-driven Arguments for Negative Effects of Informed Consumer Effectiveness on Willingness to Reuse Products and Reduce Waste

Based on the Theory of Cognitive Dissonance and the Appraisal Theory, one might conclude that informing individuals of their low consumer effectiveness might result in a feeling of discomfort (dissonance). This is a consequence of the individuals appraisals of the information that they are not effective in reducing and reusing waste, which leads to negative emotion. In order to investigate whether low informed consumer effectiveness (vs. high informed consumer effectiveness) leads to negative emotion, Study 4 investigates the appraisals for low informed consumer effectiveness (vs. high informed consumer effectiveness) and tries to indicate which emotion is evoked. While the author of the present thesis refrains from stating a formal competing

hypothesis to Hypothesis 2, one may assume the relationships shown in Figure 2, treating appraisals as mediators of the negative relationship between informed consumer effectiveness and intentions to reduce waste and reuse products.

Figure 2: Conceptual Model (Study 4 and Study 5)

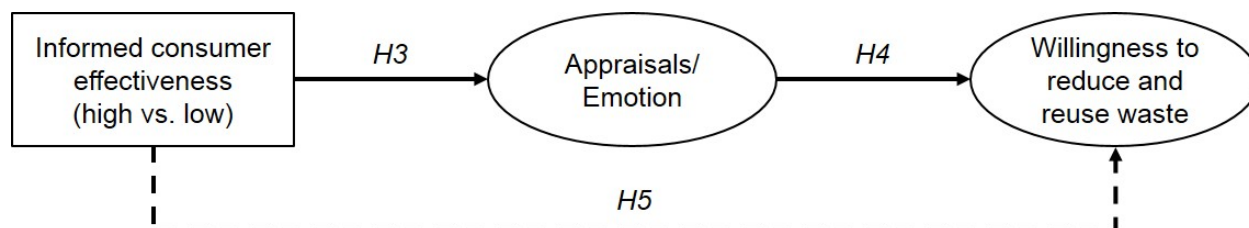


Figure 2. Source: Own illustration

In a first step, Study 4 seeks to identify differences in appraisals between high and low informed consumer effectiveness.

5.2 Empirical Evidence: Study 4

In order to find out whether cognitive dissonance might explain the negative effect of informed consumer effectiveness and willingness to reuse products and reduce waste, Study 4 investigates the appraisals of informed consumer effectiveness (high and low) and attempts to indicate the emotion that it elicits.

5.2.1 Method

Participants

There was a total of 121 participants, age range from 21 to 63 years old ($M = 32.84$, $SD = 8.73$), 43 female (35%), and all respondents resided in the USA. A convenience sampling strategy was used and participants were recruited via an online platform.

Procedure

Participants were recruited via mTurk and each respondent was given a monetary incentive (\$0.60) to take part in the survey. An online-based questionnaire was conducted and participants were assigned to either one of two conditions: low informed consumer effectiveness (67 participants) or high informed consumer effectiveness (54 participants).

Measures

The press releases used for the manipulation of high and low informed consumer effectiveness were the same as in Study 3 (Appendix D). After reading the text, respondents answered questions about how they felt while reading it. There were negative and positive emotions on the left side of the screen, and participants were asked to drag them to the right side in the order they most thought appropriate (the first tile/emotion being more prominent than the second and so on). They were instructed to use at least one tile to as many tiles they wished. The emotions stated on the screen were based on the primary emotions of appraisal theory (Roseman, 1996): surprise, hope, fear, joy, relief, sadness, distress, frustration, liking, dislike, anger, pride, shame, regret, irritation, annoyance, and concern. Participants were then asked to answer a short open question on the reason of feeling the chosen emotions (“Please write in a few short sentences about how and why were you feeling this way when reading the text.”).

After indicating how they felt when reading the text, participants answered appraisal-related questions on a 7-point rating scale based on Roseman, Spindel, and Jose’s (1990, p 914-915): situational state (3 items, Cronbach’s alpha = .83); probability (3 items, Cronbach’s alpha = .62); legitimacy (3 items, Cronbach’s alpha = .36); agency (3 items²); motivational state (3 items, Cronbach’s alpha = .75); and power (3 items, Cronbach’s alpha = .89; see Appendix E for items and scale anchors). Cronbach’s alpha for legitimacy (.36) did not indicate internal

² Cronbach’s alpha not calculated for agency items because the self, other persons, and circumstances beyond anyone’s control may independently cause an event (Roseman, 1996; Roseman et al., 1990).

consistency for the construct. Excluding the question asking whether ‘an individual perceived the event as of deserving something bad to happen’ marginally increased reliability (.44). Previous study on appraisals had indicated low scores ($<.7$) of standardized reliability coefficients – Cronbach’s alpha (Roseman et al., 1990), therefore, despite the low scores, the presented indexes were used in the analysis.

Lastly, and in order to check whether the press release differed as high and low consumer effectiveness, perceived consumer effectiveness was assessed with the same four items from Study 3 in a 7-point rating scale (Cronbach’s alpha = .90; based on Roberts, 1996). Participants were also asked to answer (10-point scale) whether consumers – 1 – or industries – 10 were the main responsible for reducing and reusing waste.

5.2.2 Results

Manipulation Check

A t-test for independent means was conducted comparing the high and low perceived consumer effectiveness press releases’ groups on informed consumer effectiveness. The analysis was significant, $t(119) = -2.29, p < .05, d = .42$, which suggests that, as expected, those in the high informed effectiveness group ($M = 5.28, SD = 1.23$) scored higher on perceived consumer effectiveness than those in the low informed effectiveness group ($M = 4.75, SD = 1.27$).

When asking participants in the different conditions who was responsible for reducing and reusing waste, respondents in the high effectiveness condition were more likely to respond with “consumers” ($M = 2.56, SD = 2.56$) than respondents in the low effectiveness condition ($M = 8.55, SD = 2.51$). Therefore, the manipulation was successful and there was a significant difference between the high and low effectiveness conditions ($t(119) = 11.95, p < .001, d = 2.16$).

Independent samples t-tests

Independent samples t-tests were used to compare participants' appraisals of informed consumer effectiveness (high vs. low) for situational state, probability, problem source, agency, motivational state and power (see Table 7). The results showed that in the low effectiveness condition ($M = 3.19$, $SD = 1.76$), participants were more likely to find the situational appraisal as motive inconsistent than in the high effectiveness condition ($M = 5.58$, $SD = 1.00$); ($t(119) = -8.89$, $p < .001$, $d = 1.67$). The motive inconsistent appraisal characterizes negative emotions, whereas motive consistent indicates positive emotions. This means that with regards to this appraisal, participants in the low effectiveness condition were more likely to experience negative emotions than the participants in the high effectiveness condition.

There was no significant difference for probability of outcomes ($t(119) = 1.17$, $p = .25$), meaning that outcomes were both certain and uncertain, independent of low or high effectiveness conditions.

As for the problem source/legitimacy appraisal, the low effectiveness group ($M = 3.75$, $SD = 1.47$) scored lower than high effectiveness group ($M = 4.45$, $SD = 1.47$); ($t(119) = -2.63$, $p < .05$, $d = .48$), showing that participants in the low effectiveness condition indicated that they deserved a bad outcome.

The appraisal of agency suggests that participants from the low perceived effectiveness group were more likely to indicate that the event is caused by others. This is shown in the significant differences between the two groups (low vs. high effectiveness) for the three agency items with the following anchors: 1. Not at all caused by someone else - Very much caused by someone else ($t(119) = 2.93$, $p < .01$, $d = .53$); 2. Not at all caused by circumstances beyond anyone's control - Very much caused by circumstances beyond anyone's control ($t(119) = 3.89$, $p < .001$, $d = .71$); and 3. Very much caused by me - Not at all caused by me ($t(119) = 4.10$, $p < .001$, $d = .75$). This means that the low effectiveness group (in comparison to the high

effectiveness group) thinks that the events were caused by someone else ($M = 3.90$, $SD = 2.02$; $M = 2.81$, $SD = 2.02$), that they are caused by circumstances beyond anyone's control ($M = 5.24$, $SD = 1.62$; $M = 4.09$, $SD = 1.59$), and that they are not caused by oneself ($M = 4.84$, $SD = 1.76$; $M = 3.52$, $SD = 1.75$).

Table 7: Differences in Appraisals between Informed High and Low Consumer Effectiveness (Results of Study 4)

Appraisal		Low CE	High CE	T-Test
Situational (motive consistent versus inconsistent)	<i>Mean</i>	3.19	5.58	$t(119) = -8.89$, $p < .001$, $d = 1.67$
	<i>SD</i>	1.76	1.00	
Probability	<i>Mean</i>	4.04	3.99	$t(119) = .24$, $p = .25$
	<i>SD</i>	1.09	1.21	
Problem source/legitimacy	<i>Mean</i>	3.75	4.45	$t(119) = -2.63$, $p < .05$, $d = .48$
	<i>SD</i>	1.47	1.47	
Motivational state	<i>Mean</i>	4.00	4.70	$t(119) = -2.5$, $p < .05$, $d = .46$
	<i>SD</i>	1.68	1.36	
Power	<i>Mean</i>	4.16	4.87	$t(119) = -5.40$, $p < .001$, $d = 1.00$
	<i>SD</i>	1.58	1.32	

Note. CE = consumer effectiveness.

For motivational state, the low effectiveness group ($M = 4.00$, $SD = 1.68$) scored lower than the high effectiveness group ($M = 4.70$, $SD = 1.36$; $t(119) = -2.51$, $p < .05$, $d = .46$). This means that participants from the low effectiveness group were more likely to avoid pain, minimize costs and seek less of something negative in comparison to the high effectiveness group.

The results for the appraisal of power showed that the low effectiveness group ($M = 3.22$, $SD = 1.58$) scored significantly lower than the high effectiveness group ($M = 4.67$, $SD = 1.32$; $t(119) = -5.40$, $p < .001$, $d = 1.00$). This indicates that participants in the low effectiveness group tended to feel weaker and powerless in comparison to the high effectiveness group.

Content analysis

Content analysis was performed using MAXQDA Analytics Pro (2016) for the open question (“Please write in a few short sentences how and why were you feeling this way when reading the text.”). Datasets from two coders were imported into the software for data analyses. Consistency among raters was calculated with an interrater reliability analysis using Kappa statistic. According to Fleiss, Levin and Paik’s threshold (2003), the interrater reliability was fair, with Kappa = .51.

The analysis indicated the most common discrete emotions. Words and sentences describing sadness, hopefulness, surprise, concerned and anger were common. Participants used words and sentences related to powerless and helpless (e.g., “It makes me feel very powerless and unable to help the environment and that scares me because of global warming.” and “I feel helpless because corporations get to do whatever they want while consumers want change but cannot affect it.”). The same pattern can be seen for sentiments of frustration (e.g., “I get very frustrated at the amount of packaging on so many of the products that I buy”), scare (e.g., “It is incredibly scary hearing about the amount of trash being generated, the idea that I cannot make much of an impact.”), and anger (e.g., “It makes me angry and upset that people keep hearing these things are going to happen to the environment.” and “It makes me angry that people are wasteful and they just do not care.”).

5.2.3 Discussion

The appraisals shown do not represent a specific emotion in all respects. There is, however, a strong indication of the emotions of anger or dislike for the manipulated low informed consumer effectiveness, as both emotions fit the results of inconsistent motive (situational state), blaming others (agency) and no differentiation between certain or uncertain probability (probability). In addition to these appraisals, participants’ appraisal of deserving something bad

to happen (legitimacy) also indicated the emotion anger, showing that there is a stronger tendency for anger than for dislike. This is supported by the content analysis, which indicates that words and sentences describing anger were most common.

Inconsistent to the appraisals for anger were the appraisals for motivational state and power. For motivational state, participants from the low effectiveness group were more likely to avoid pain, minimize costs, and seek less of something negative in comparison to the high effectiveness group. This could be explained by the nature of the manipulation: in the low effectiveness condition, which depicted consumers in the negative light of not being effective in reducing and reusing waste, there was a more negative individual connotation than in the high effectiveness condition. This could have steered participants' answers of seeking less of something negative.

As for power, participants in the low effectiveness group tended to feel weaker and powerless in comparison to the high effectiveness group. Since power is related to one's perception of being weak (or strong), the construct can be seen as close to the construct of perceived consumer effectiveness, and therefore directly related to the manipulation. The press release with manipulated low informed consumer effectiveness would communicate a sense of lack of power. The content analysis supports this by showing that powerlessness (and also helplessness) frequently appeared in participants' answers. Moreover, the result for the appraisal of power is in accordance to studies that were unsuccessful in presenting an association between anger and this particular appraisal (e.g., Kuppens, Mechelen, Smits, De Boeck, & Ceulemans, 2007).

Despite the inconsistent results for the appraisals of motivational state and power in regard to identifying the discrete emotions of anger, Study 4 gives indications that the appraisals for low informed consumer effectiveness elicit some important dimensions of appraisals that are indicative of anger: situational appraisal, probability, problem source and agency. However, how

do anger-related appraisals affect the previously proposed model? If informed consumer effectiveness leads to anger-related appraisals, how do they affect willingness to reuse products and reduce waste? Study 5 incorporates anger into the model (Figure 2) which proposes that informed consumer effectiveness negatively affects anger, which in turn has an effect on willingness to reuse products and reduce waste.

5.3 Empirical Evidence: Study 5

In order to assess whether anger has a mediating role between informed consumer effectiveness and willingness to reuse products and reduce waste, Study 5 investigates the following mediation chain: informed (high) consumer effectiveness influences anger, which in turn impacts consumers' intention to reuse products and reduce waste. According to arguments taken from the Cognitive Dissonance Theory and the Appraisal Theory, low informed (vs. high informed) consumer effectiveness increases anger (H3), which in turn has the motivational power of being positively related to environmental-friendly disposal behavior (H4).

5.3.1 Method

Participants

There was a total of 582 participants, with ages ranging from 18 to 68 years old ($M = 33.50$, $SD = 11.80$), 326 were female (56%). A convenience sampling strategy was applied and participants were recruited via a marketing agency in Brazil. Table 8 summarizes the information of the sample collected in this study.

Table 8: Demographics of the Participants of Study 5

Gender			Income (Yearly Gross per Household)		
Male	256	(44.00%)	<R\$880	233	(38.80%)
Female	326	(56.00%)	R\$881-R\$1.760	214	(35.70%)
Total	582	(100.00%)	R\$1.761-R\$52.799	129	(21.50%)
			≥R\$53.800	26	(14.70%)
Age			Marital Status		
18-29 years	264	(45.30%)	Single	288	(49.50%)
30-39 years	129	(22.20%)	Married	258	(44.30%)
40-49 years	123	(21.10%)	Separated	10	(1.70%)
50-59 years	51	(8.80%)	Widowed	9	(1.50%)
60-69 years	15	(2.60%)	Divorced	17	(2.90%)
Household size			Education Level		
1	38	(6.50%)	Elementary school	35	(6.00%)
2	108	(18.50%)	High school	298	(51.20%)
3	172	(29.50%)	Bachelor's Degree	223	(38.30%)
4	150	(25.80%)	Master's Degree	20	(3.40%)
>5	114	(19.70%)	Advanced Graduate/Ph.D.	6	(1.00%)

Note. Income ranges based on the minimum wage in Brazil at the time of data collection. Social class E and D (<R\$21.120), social class C (R\$21.120-R\$31.679), social class B (R\$31.680-R\$52.799) and social class A (≥R\$53.800) (IBGE, 2016).

Procedure

An online questionnaire was conducted and all respondents resided in Brazil. A marketing agency recruited participants, who received a small incentive for their participation. Participants were randomly assigned to either one of two conditions: low or high informed consumer effectiveness. The press releases used for the manipulation were the same used in Studies 3 and 4 (Appendix D).

Measures

Anger was measured with four items: irritated, angry, annoyed, and concerned (based on Dillard & Shen, 2005; Cronbach's alpha = .83). Willingness to reuse products and reduce waste was measured with the same scale of Studies 1, 2, and 3, proposed by Barr, Gilg, and Ford (2001; Cronbach's alpha = .82; see Appendix A). The item: "According to the text, there is much

that any one consumer can do about the environment” was included to check whether the manipulation worked. All items were measured on 5-point rating scales (from 1 – strongly disagree to 5 – strongly agree).

In order to conduct the mediation analysis, it is necessary to determine whether the constructs of anger and willingness to reuse products and reduce waste are discriminant from each other. The thresholds of .6 was used for composite reliability (Bagozzi & Yi, 1988), .5 for AVE was used for convergent validity and <1 for the Fornell and Larcker criterion for discriminant validity (ratio of highest squared correlation of a construct to AVE of the construct; Fornell & Larcker, 1981). Composite reliability for negative emotions = .85; composite reliability for willingness to reuse products and reduce waste = .91; AVE for negative emotions = .61; AVE for willingness to reuse products and reduce waste = .51; squared correlation = .03. The results indicated that both scales were discriminant and unrelated to each other.

5.3.2 Results

Manipulation check

Participants in the high informed consumer effectiveness condition ($M = 4.65$, $SD = .72$) perceived their actions to reduce waste as more effective than those in the low informed consumer effectiveness condition ($M = 4.50$, $SD = .89$), $t(598) = -2.21$, $p < .05$. This indicates that the experimental manipulation was successful.

Regression

In order to analyze to which extent the effect of informed consumer effectiveness on willingness to reuse products and reduce waste is mediated by anger (H5), a mediation analysis was conducted. Regression-based PROCESS is a useful procedure for mediation analysis, as it uses bootstrapping to test the significance of the indirect path (Hayes, 2017), which is deemed significant if the confidence interval does not include zero (Preacher & Hayes, 2008).

Regression-based PROCESS model 4 (Hayes, 2017) was used to test the hypothesis that informed consumer effectiveness decreases negative emotions identified based on appraisals (here anger; H3), which in turn positively relate to the intention to reuse products and reduce waste (H4). A bootstrap estimation approach with 1,000 samples was applied (Shrout & Bolger, 2002). The results of the analysis show that informed consumer effectiveness reduces anger, $b = -.39$, $SE = .09$, $p < .001$. Informing that consumers' effectiveness in reducing waste is high led to lower ratings of anger, whilst informing that consumers' effectiveness in reducing waste is low led to higher ratings of anger. Approximately 3% of the variance of anger was accounted for by informed consumer effectiveness ($R^2 = .03$). The results also show that anger is a positive and significant predictor of intentions to reuse products and reduce waste, $b = .08$, $SE = .02$, $p < .001$, showing that higher ratings of anger triggered higher likelihood of engaging in product reusage and reduction of waste. Anger explained 2% of the variance of willingness to reuse products and reduce waste was ($R^2 = .02$).

Most importantly, the indirect effect of manipulated consumer effectiveness on intention to reuse products and reduce waste via the mediator is significant, $b = -.03$, $SE = .01$, 95% confidence interval = $[-.0570, -.0128]$. As there is no direct effect of informed consumer effectiveness on intention to reuse products and reduce waste, $b = .01$, $SE = .05$, $p = .85$, the mediator fully mediates the effect of informed consumer effectiveness on consumer intentions.

Demographics

The same regression as above controlling for age, gender, income, and educational level as direct predictors of the dependent variable was conducted to investigate whether demographics have an impact on waste reduction and reusage. Three dummy variables for educational level were constructed: no high school, high school, some college/bachelor's and master/Ph.D. groups, with the master/Ph.D. as the reference group. While income ($b = .02$, $SE = .03$, $p = .37$) and educational level (no high school: $b = .02$, $SE = .16$, $p = .90$; high school: $b =$

-.03, $SE = .13$, $p = .79$; college/bachelor's: $b = -.003$, $SE = .12$, $p = .98$) had no significant effect on disposal behavioral intentions, age ($b = .007$, $SE = .002$, $p < .05$) and gender ($b = .12$, $SE = .05$, $p < .05$) were found to be significant predictors of waste reduction and reuse. Women and older individuals scored higher on the dependent measure. Informed consumer effectiveness had a non-significant effect on willingness to reuse products and reduce waste ($b = .02$, $SE = .05$, $p = .71$). The R^2 was 5%, which means that this percentage of the variance of waste reduction and reuse is explained not only by anger ($b = .08$, $SE = .02$, $p < .05$), but also by gender and age. Most importantly, when controlling for demographics the indirect effect of informed consumer effectiveness on willingness to reuse products and reduce waste via anger was negative and significant, $b = -.03$, $SE = .01$, 95% confidence interval = [-.0605, -.0058].

5.3.3 Discussion

Study 5 showed that informing people about their limited effectiveness in reducing waste creates anger that can increase pro-environmental behavioral intentions. Anger thus has a motivating character. This is explained through cognitive dissonance, a negative affective state created by two opposing cognitions (Festinger, 1957). The cognitive dissonance motivates people to change their states behavior in order to neutralize this sense of discomfort. Indeed, evidence shows that negative emotions have the power of making consumers perceive themselves as the source of issues related to sustainability (negative affect state), inducing them to act in a pro-environmental manner in order to avoid that negative feeling (Antonetti & Maklan, 2014; Theotokis & Manganari, 2015). This could rationalize that consumers informed of their low effectiveness experience negative emotions and are more likely to consequently engage in environmental friendly disposal behavior, in order to avoid feeling these negative emotions.

However, there are reasons to believe that this effect differs between consumers according to their perspective on the future, particularly in regard to reducing environmental

harm for future generation caused by consumers' consumption practices. Next, the concept of consumers' concern for future consequences is introduced, a variable that measures people's awareness of long-term environmental issues.

6 Sustainable Behavior and Consideration of Immediate and Future Consequences

Sustainable consumption refers to the level of consumption which meets present needs without compromising the capacity of future generations to meet their needs (World Commission on Environment and Development, 1987). In the environmental scope, there is an interest in preserving natural resources to secure them for these future generations (Milfont, Wilson, & Diniz, 2012, 325). Therefore, protecting the environment encompasses temporal concern and entails a temporal conflict of short-term versus long-term interests. In other words, it is important to consider the perception of time regarding environmental outcomes, especially when talking about environmental friendly disposal behavior.

6.1 Theoretical Perspective on the Moderating Role of Consideration of Immediate and Future Consequences

In the time perspective literature, consideration of immediate and future consequences has been in focus, as the construct has a motivational character: “it enables an individual to perceive what his or her future field might require or demand behaviorally, in order to reach desired outcomes” (Petrocellia, 2003. 406). Consideration of immediate and future consequences relates to how a person considers the temporal impact of his or her own actions. Strathman, Gleicher, Boninger, & Edwards (1994) introduced the construct, proposing that individuals differ by considering the immediate or future consequences of their actions.

Consideration of immediate consequences is when individuals consider immediate outcomes and therefore believe that their actions are worthwhile because of the benefits experienced immediately (Strathman et al., 1994). These individuals are worried about and place a high priority on immediate welfare at the expense of future benefits. Because of the higher importance of immediate goals, they are more influenced by the certain immediate outcomes than by the uncertain future ones.

On the other hand, consideration of future consequences is when individuals consider distant outcomes and therefore believe that certain actions and behaviors are worthwhile because of future benefits, even if immediate outcomes are not desired, for example when they are inconvenient or costly (Strathman et al., 1994). These individuals are willing to forgo immediate benefits to achieve a more desirable future state. Thus, the construct distinguishes two temporal perceptions: immediate and future consequences of the behavioral outcome.

These perceptions of immediate and future consequences were already used in health (Adams, 2012; Orbell & Hagger, 2006; Orbell & Kyriakaki, 2012), nutrition (Dassen, Houben, & Jansen, 2015; van Beek, Antonides, & Handgraaf, 2013), and environmental areas (Arnocky, Milfont, & Nicol, 2014; Greitemeyer, 2013; Joireman, Lasane, Bennett, Richards, & Solaimani, 2001; J. Joireman, Posey, Truelove, & Parks, 2009; Kortenkamp & Moore, 2006; Lindsay & Strathman, 1997).

Research in the health scope indicated that greater consideration of immediate consequences was associated with higher body mass index (BMI) and greater likelihood of being a smoker (Adams, 2012). It has also shown that individuals with low (high) consideration of future consequences were more (less) persuaded to take part in a type 2 diabetes screening program when there were positive short-term outcomes and negative long-term outcomes (Orbell & Hagger, 2006). Orbell & Kyriakaki (2012) also presented evidence of the role of consideration of future consequences on the preventing behavior of using sunscreen. The results showed that high consideration of future consequences led to higher persuasion when the message contained positive long-term and negative short-term consequences of using sunscreen.

Consideration of immediate and future consequences has also been researched in the area of nutrition. For example, Dassen et al. (2015) explored the relationship between this temporal construct and its influence on healthy eating. The authors were able to establish a connection between consideration of immediate consequences with unhealthy eating and

between consideration of future consequences with healthy eating. Eating behavior and time orientation were also the focus of van Beek et al. (2013). In their study, the authors were able to substantiate the association of consideration of immediate consequences and food consumption and the link between consideration of future consequences and exercise. Both studies suggest that shifting consideration of immediate consequences of eating to a future prospect (consideration of future consequences) might work as an intervention to advocate for healthier eating habits.

In the environmental scope, previous studies showed that consideration of future consequences correlates positively with environmental concern and self-reported pro-environmental behavior (Arnocky, Milfont, & Nicol, 2014; Ebreo et al., 1999), attitude towards global warming (Greitemeyer, 2013), consumer cooperation in resource dilemmas (Joireman et al., 2009; Kortenkamp & Moore, 2006), social value orientations (Joireman 2001), and recycling behavior (Lindsay & Stratham, 1997).

Stratham et al. (1994) developed the construct as a one-factor solution, with consideration of immediate consequences at one end and consideration of future consequences at the other end of the continuum. This approach, however, have been refuted and recent research has indicated that there are two-factors: consideration of immediate and future consequences (Joireman, Balliet, Sprott, Spangenberg, & Schultz, 2008; Joireman & King, 2016; Petrocelli, 2003). Joireman and King (2016, p. 321) wrote about the scale's dimensionality: "In sum, [...] CFC scale contains more than one factor, as studies comparing the fit of a one-factor to a two-factor model routinely find that the one-factor model fits less well."

Separating the construct into consideration of immediate and future consequences will possibly give more insight into the mechanisms of temporal perspective in relation to willingness to reuse products and reduce waste. Short-term outcomes do not automatically indicate a concern for the distant future and the opposite also applies (Petrocelli, 2003). Individuals who

are concerned about the immediate and future outcomes of their actions develop attitudes (and behaviors) that are in agreement with their perspective on their influence on distant environmental outcomes. These perceptions on immediate and distant outcomes should, therefore, influence the person's attitudes toward the environment. If each person's contribution to achieving positive outcomes is distorted (here: low informed consumer effectiveness) creating anger as a negative emotion, consumers more concerned about future outcomes should respond more strongly to neutralize anger as a negative emotion in order to restore the feeling that they contribute to protecting the environment. Conversely, consumers more concerned about immediate outcomes should respond less strongly to neutralize anger. Thus, the temporal construct of consideration of immediate and future consequences might moderate the effect of anger on willingness to reuse products and reduce waste in the following sense:

Hypothesis 6a: The effect of informed consumer effectiveness on willingness to reduce waste and reuse products via anger is stronger for consumers with low consideration of immediate consequences vs. high consideration of immediate consequences.

Hypothesis 6b: The effect of informed consumer effectiveness on willingness to reduce waste and reuse products via anger is stronger for consumers with high consideration of future consequences vs. low consideration of future consequences.

Figure 3 summarizes the predictions.

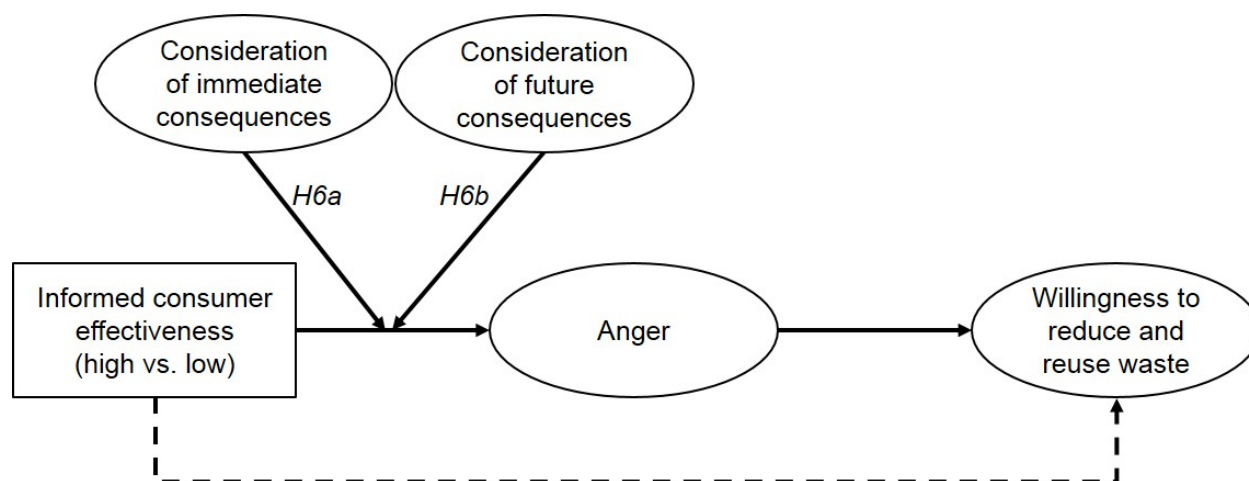
Figure 3: Conceptual Model (Study 6)

Figure 3. Source: Own illustration

6.2 Empirical Evidence: Study 6

Study 6 assesses whether consideration of immediate and future consequences moderate the relationship between informed consumer effectiveness, anger, and intended environmental friendly disposal behaviors.

6.2.1 Method

Participants

There was a total of 604 participants, with ages ranging from 18 to 74 years old ($M = 34.40$, $SD = 11.20$), 221 were female (36.5%). All respondents resided in the US. More detailed demographics for Study 6 is shown in Table 9. A convenience sampling strategy was used to recruit participants via an online platform.

Procedure

An online survey was conducted in the US and participants were recruited via mTurk. A small financial compensation (\$0.30) was given to participants. In the experimental study, consumer effectiveness was manipulated with the same press releases from previous studies

(Studies 3, 4, and 5; Appendix D). Participants were randomly assigned to one of the two experimental conditions. After participants had read the texts, they filled in a written survey, including the variables of interest, potential confounds, and sociodemographics.

Table 9: Demographics of the Participants of Study 6

Gender			Income (Yearly Gross per Household)		
Male	383	(63.50%)	<\$25.000	212	(35.04%)
Female	221	(36.50%)	\$25.000 to \$49.999	194	(32.07%)
Total	604	(100.00%)	\$50.000 to \$74.999	112	(18.51%)
			≥\$75.000	87	(14.38%)
Age			Marital Status		
18-29 years	246	(40.73%)	Single	265	(43.80%)
30-39 years	211	(34.93%)	Married	287	(47.44%)
40-49 years	75	(12.42%)	Separated	11	(1.82%)
50-59 years	40	(6.62%)	Widowed	12	(1.98%)
60-75 years	32	(5.30%)	Divorced	30	(4.96%)
Household size			Education Level		
1	84	(14.12%)	Did not complete High School	1	(0.17%)
2	122	(20.50%)	High School/GED	39	(6.45%)
3	139	(23.36%)	Some College	146	(24.13%)
4	133	(22.35%)	Bachelor's Degree	289	(47.77%)
5	86	(14.45%)	Master's Degree	118	(19.50%)
≥6	31	(5.21%)	Advanced Graduate/Ph.D.	12	(1.98%)

Variables

Questions used to assess anger (Cronbach's alpha = .79), willingness to reuse products and reduce waste (Cronbach's alpha = .89; see Appendix A), and to perform the manipulation check were measured via the same scales as in Study 5. Both scales for consideration of future and immediate consequences were measured respectively with seven items on five-point rating scales from 1 – strongly disagree to 5 – strongly agree (Joireman, Staffer, Balliet, & Strathman, 2012; see Appendix F). An example of the consideration of future consequences item was “When I make a decision, I think about how it might affect me in the future”, which meant that higher

ratings indicated an individual who is very concerned about future consequences and therefore cares for the environment. An example of consideration of immediate consequences item was “I only act to satisfy immediate concerns, figuring the future will take care of itself”, indicating that higher ratings of immediate consequences characterize a person who is very concerned about immediate outcomes and therefore less caring for the environment. The consideration of immediate and future consequences scales were reliable, with Cronbach’s alpha = .86 (future) and Cronbach’s alpha = .93 (immediate).

In order to conduct the mediation analysis, it is necessary to determine whether the constructs of negative emotions and willingness to reduce and reuse waste were discriminant from each other. The threshold of .6 was used for composite reliability (Bagozzi & Yi, 1988), .5 for AVE was used for convergent validity and <1 for the Fornell and Larcker criterion for discriminant validity (ratio of highest squared correlation of a construct to AVE of the construct; Fornell & Larcker, 1981). Composite reliability for negative emotions = .89; composite reliability for willingness to reuse products and reduce waste = .90; AVE for negative emotions = .67; AVE for willingness to reuse products and reduce waste = .50; squared correlation = .02. The results indicated that both scales were discriminant and unrelated to each other.

6.2.2 Results

Manipulation check

The experimental manipulation was successful and participants in the high consumer effectiveness condition ($M = 4.13$, $SD = 0.92$) perceived consumers’ actions to reduce waste as more effective than those in the low consumer effectiveness condition ($M = 3.07$, $SD = 1.31$), $t(602) = -11.74$, $p < .001$.

Confirmatory factor analysis of the consideration of future consequences scale

Confirmatory factor analysis using Mplus (Muthén & Muthén, 2011) was conducted and the one-factor model showed a relatively poor fit with the data, $\chi^2 (77) = 1068.12, p < .001$, CFI = .70. RMSEA = .15, LL = .14, HL = .15, SRMR = .17. By contrast, the two-factor model showed an adequate fit to the data, $\chi^2 (76) = 139.21, p < .001$, CFI = .98. RMSEA = .04, LL = .03, HL = .05, SRMR = .04. The two-factor model provided a statistically better fit to the data than the one-factor model, $\chi^2 (1) = 562.10, p < .001$ (Satorra & Bentler, 2010). These results suggest that there are two scales: one that considers immediate concern (consideration of immediate consequences) and another that considers future concern (consideration of future consequences).

Regression

Regression-based PROCESS model 9 (Hayes, 2017) was used to test the hypothesis that anger mediates the effect of manipulated consumer effectiveness on willingness to reuse products and reduce waste. The analysis assesses the moderating effect of consideration of immediate and future consequences on the relationship between perceived consumer effectiveness and anger. A bootstrap estimation approach with 1,000 samples was applied (Shrout & Bolger, 2002).

The results of the analysis show similar results for the mediation proposed in Study 5, thus providing further support for Hypotheses 3, 4, and 5: informed consumer effectiveness decreases anger, $b = -.23, SE = .08, p < .05$; anger has an effect on consumers' willingness to reuse products and reduce waste, $b = .18, SE = .03, p < .001$. The results also show a negative indirect effect, $b = -.04, SE = .02$, 95% confidence interval = $-.0795, -.0163$ (when consideration of immediate and future consequences are set to "0"). There was a marginal significance of the direct effect of informed consumer effectiveness on intention to reuse products and reduce waste, $b = .10, SE = .06, p = .07$. Approximately 6% of the variance of anger was accounted for

by informed consumer effectiveness, consideration of future consequences and the interaction of consideration of immediate consequences and informed consumer effectiveness ($R^2 = .06$). As for willingness to reuse products and reduce waste, anger and informed consumer effectiveness explained 7% of its the variance ($R^2 = .07$).

Consideration of immediate and future consequences as moderators

Analyzing the effect of consideration of immediate consequences on the relationship between perceived consumer effectiveness and anger, the direct effect of consideration of immediate consequences on anger is non-significant ($b = .06$, $SE = .04$, $p = .14$). Most importantly, there was a positive and significant interaction of informed consumer effectiveness and consideration of immediate consequences on anger, $b = .20$, $SE = .09$, $p < .05$.

Results of the indirect effects of consumer effectiveness and anger on consumer intentions to reuse products and reduce waste at different levels of consideration of immediate consequences show that: at low levels of consideration of immediate consequences, 1 *SD* below the mean of consideration of immediate consequences, the indirect effect is negative and significant, $b = -.07$, $SE = .03$, 95% confidence interval = $[-.1421, -.0322]$. At high levels of consideration of immediate consequences, 1 *SD* above the mean, the effect becomes non-significant, $b = -.008$, $SE = .02$, 95% confidence interval = $[-.0503, .0329]$. The results for the indirect effects show that only individuals that have low consideration of future consequences are affected by informed consumer effectiveness.

Taking into account consideration of future consequences as moderator, the results show there was a positive and direct effect of consideration of future consequences on anger, $b = .31$, $SE = .07$, $p < .001$, but no interaction effect of informed consumer effectiveness and consideration of future consequences, $b = .003$, $SE = .13$, $p = .98$. Thus, the interaction effect cannot be replicated for consideration of future consequences.

Demographics

The same regression-based model was conducted using age, gender, income, and educational level as additional predictors of behavioral intentions to reduce waste and reuse products to investigate whether demographics have an impact on waste reduction and reuse. As in the previous study, three dummy variables for educational level were constructed: no high school, high school, some college/bachelor's and master/Ph.D. groups, with the master/Ph.D. as the reference group. Gender ($b = .08$, $SE = .06$, $p = .19$), income ($b = -.02$, $SE = .03$, $p = .40$) and education (no high school: $b = .30$, $SE = .68$, $p = .66$; high school: $b = -.17$, $SE = .13$, $p = .17$; college/bachelor's: $b = -.02$, $SE = .07$, $p = .72$) were not predictors of the assessed disposal behavior. Age ($b = .005$, $SE = .003$, $p < .05$) was found to be a significant predictor of waste reduction and reuse. The older the individual, the higher the scores of the dependent measure. Informed consumer effectiveness had a positive and marginal significant effect on willingness to reuse products and reduce waste ($b = .10$, $SE = .06$, $p = .07$). The R^2 was 8%, which means that this percentage of the variance of waste reduction and reuse is explained not only by anger ($b = .18$, $SE = .03$, $p < .001$), but also by informed consumer effectiveness and age. Similar to the results in Study 5, when controlling for demographics the indirect effect of informed consumer effectiveness on willingness to reuse products and reduce waste via anger was negative and significant, $b = -.04$, $SE = .02$, 95% confidence interval = $[-.0795, -.0163]$.

6.2.3 Discussion

The study revealed three main findings. First, the results on the indirect effect of informed consumer effectiveness on intended reuse of products and reduction of waste (see Study 5) could be replicated. Informed low consumer effectiveness increased anger, which in turn positively affected willingness to reuse products and reduce waste.

Second, the study introduced moderators of the effects of consumer effectiveness on negative emotions: consideration of immediate and future consequences. Taking into account

consideration of immediate consequences: low levels supported the negative indirect effect of informed consumer effectiveness on willingness to reuse products and reduce waste via anger. When individuals with low consideration for immediate outcomes were told they were effective, their motivation decreased. For individuals with high consideration for immediate consequences, there was no such negative effect (n.s.).

When examining consideration of future consequences, the interaction effect could not be replicated. This means that consideration of future consequences had no effect (n.s.) on the relationship between informed consumer effectiveness on the willingness to reuse products and reduce waste via anger. These results challenge previous research on the predictive power of consideration of future consequences on environmental issues (Arnocky, Milfont, & Nicol, 2014; Ebreo, Hershey, & Vining, 1999; Greitemeyer, 2013; Lindsay & Strathman, 1997)

Third, the finding that immediate (but not future) considerations influence the proposed mediation chain provides suggestive evidence for the distinctiveness of the two dimensions. Because the construct comprises items related to present and future consequences, using one summary score could indicate a mix of consideration for immediate and future outcomes (Joireman, Kees, & Sprott, 2010). Therefore, the results of this study indicate that the construct should contribute to the discussion about the dimensionality of the construct and corroborate with studies that indicated that concern for immediate outcomes, and not future, has an impact on different issues (e.g., self-control and temporal discounting in Joireman, Balliet, Sprott, Spangenberg, & Schultz, 2008; and credit card debt in Joireman et al., 2010).

Demographics

As for demographics, only age had a significant impact on willingness to reuse products and reduce waste: the older the individual, the higher the scores of the dependent measure. This result is inconsistent to one of the results of Study 5, which also indicated that age is a predictor of willingness to reuse products and reduce waste. Nevertheless, it does not fit to the overall

results of Studies 1–5, which indicated that age (Study 1 and Study 5), education (Study 1 and Study 2) and gender (Study 2 and Study 5) influence the willingness to engage in pro-environmental disposal behavior.

7 Overview of Results, Implications and Outlook

This chapter summarizes the results of Studies 1–6 and reviews the main findings of this thesis. Theoretical and managerial implications are discussed, followed by an overview of limitations and an outlook on future research opportunities.

7.1 Overview of the Results of the Studies

Studies 1–6 had the objective of assessing the influence of perceived consumer effectiveness on behavioral intentions related to disposal behavior. In order to do so, different approaches were taken, ranging from online data collection to face-to-face interviews and experiments. This range of approaches has the advantage of answering newly raised questionings and implementing new research designs that the researcher was not able to substantiate at the beginning of the research process. Table 10 shows an overview of the objectives, methods, results, and links from Studies 1–6.

The studies show that perceived consumer effectiveness influences willingness to reuse products and reduce waste. When measuring (Study 1) or priming (Study 2) perceived consumer effectiveness, there was a positive relationship between the construct and the willingness to reuse products and reduce waste. This is due to the fact that the more one believes that one's action is effective in order to solve the given environmental problem, the more this individual is likely to take this action. The results of Study 1 and Study 2 provide evidence for this relationship and support previous findings from perceived consumer effectiveness and environmental behavior.

Table 10: Overview of Studies 1 to 6

	Study 1	Study 2	Study 3	Study 4	Study 5	Study 6
Objective and content	Assess the influence of measured PCE on willingness to reduce waste and reuse products	Assess the influence of primed PCE on willingness to reduce waste and reuse products	Assess the influence of informed CE on willingness to reduce waste and reuse products	Test the appraisals for low and high informed CE	Mediation chain: informed CE on anger on willingness to reduce waste and reuse products	Moderated mediation: consideration of immediate and future consequences as moderator of the mediation chain
Methods	Online survey (mTurk); N = 253	Computer lab experiment; N = 185	Pen-and-paper survey; N = 176	Online survey (mTurk); N = 121	Online survey (OpinionBox) N = 582	Online survey (mTurk); N = 604
Main results	Measured PCE has a positive effect on willingness to reduce waste and reuse products	Primed PCE has a positive effect on willingness to reduce waste and reuse products	Informed CE has a negative effect on willingness to reduce waste and reuse products	Appraisals for low informed CE indicated the emotion of anger	Informed CE had a negative effect on anger, which had a positive effect on willingness to reduce waste and reuse products	Consideration of immediate (but not future) consequences moderated the mediation chain
Link to next study	Investigation of the possible manipulation of PCE needed	Use of primed PCE might not be easy to implement in public policy and environmental campaigns. An approach to informed PCE is needed	Informed CE delivered negative results, unlike measured and primed PCE. Investigation of the negative effect of informed CE and its appraisals needed	Appraisals for informed CE elicit anger. Investigation of anger as a mediator between informed CE and willingness to reduce waste and reuse products needed	The mediation chain of informed CE, anger and willingness to reuse products and reduce waste might be moderated by consideration of immediate and future consequences	

Note. PCE = perceived consumer effectiveness, CE = consumed effectiveness

This thesis also investigates the influence of informed consumer effectiveness on willingness to reuse products and reduce waste, and provides evidence with Study 3 that there is a negative effect between informed consumer effectiveness and environmental-friendly disposal behavioral intentions. One possible explanation for this effect is that the appraisals of low (vs. high) informed consumer effectiveness leads to more (less) appraisals related to negative emotions, which in turn affect willingness to reuse products and reduce waste. This is further investigated with Study 4, which indicated that appraisals of low (vs. high) informed consumer effectiveness elicit the emotion of anger (with regard to most but not all dimensions of appraisal), which has a motivational power for behavioral change, at least at the intentional level.

This motivational power was explored in Study 5 by testing whether informed consumer effectiveness influences anger (as a negative emotion), which in turn has an impact on willingness to reuse products and reduce waste. Study 5 showed that informing people about their limited effectiveness in reducing waste creates anger that can increase pro-environmental behavioral intentions. Anger thus has a motivating character, explained through cognitive dissonance. This rationalizes that consumers informed of their low effectiveness experience anger and are then more likely to consequently engage in environmental friendly disposal behavior, in order to avoid feeling the appraisals that are related to this negative emotion.

However, there are reasons to believe that this effect differs between consumers according to their perspective of time and Study 6 assesses whether consideration of immediate and future consequences moderate the relationship between informed consumer effectiveness, anger, and intended environmental friendly disposal. The study replicated the results of Study 5, reinforcing that informed consumer effectiveness has an impact on anger,

which in turn influences environmental friendly disposal behavior and showed that low (vs. high) levels of consideration of immediate (but not future) consequences strengthen the indirect effect.

As for the influence of demographics over and above the independent, mediating, and moderating variables considered in the analyses, Studies 1–6 did not show consistent findings of the influence of age, gender, educational background, and income on willingness to reuse products and reduce waste. These results suggest that demographics are not likely to determine environmental friendly disposal behavior (see Table 11 for an overview of these results).

Table 11: Overview of the Influence of Demographics on Willingness to Reuse Products and Reduce Waste

	Age			Gender			Income			Education								
	β	SE	<i>p</i>	β	SE	<i>p</i>	β	SE	<i>p</i>	No high school			High school			Some college/ Bachelor's		
	β	SE	<i>p</i>	β	SE	<i>p</i>	β	SE	<i>p</i>	β	SE	<i>p</i>	β	SE	<i>p</i>	β	SE	<i>p</i>
1	.007	.003	.04	.05	.08	.51	.02	.04	.61	.03	.30	.91	-.42	.16	.01	-.03	.11	.77
2	.03	.02	.20	.24	.10	.01	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	.21	.29	.48	.52	.29	.07
3	.005	.004	.19	.16	.11	.15	.04	.05	.41	n.a.	n.a.	n.a.	-.54	.39	.17	-.19	.17	.28
5	.007	.002	.001	.12	.05	.02	.02	.03	.37	.02	.16	.90	-.03	.13	.79	-.003	.12	.98
6	.005	.003	.03	.08	.06	.19	-.02	.03	.40	.30	.68	.66	-.17	.13	.17	-.03	.07	.72

Note. n.a. = not assessed. Age, gender, education and income were assessed in combination with other variables: Perceived consumer effectiveness (Study 1 and Study 2), informed consumer effectiveness (Study 3, Study 5 and Study 6), anger (Study 5 and Study 6) and consideration of immediate and future consequences (Study 6). Reference group for education: master/Ph.D.

7.2 Theoretical Implications

This thesis gives new insights on the relationship between perceived consumer effectiveness and willingness to reuse products and reduce waste, a dependent variable that

has not been considered extensively in consumer behavior research, and contributes to the literature in several aspects. First, the results reveal a positive effect of measured and primed perceived consumer effectiveness on willingness to reuse products and reduce waste. This finding is in line with the literature of perceived consumer effectiveness, which states that the construct has a positive effect on socially conscious consumer behavior (Antil, 1984; Kinnear et al., 1974; Webb et al., 2008; Webster, 1975), ecologically conscious consumer behavior (Roberts, 1996), purchase behavior (Albayrak et al., 2011; Ellen et al., 1991; Kim & Choi, 2005), and environmental attitude (Kang et al., 2013; Tan, 2011; Tucker et al., 2012). This shows that perceived consumer effectiveness is an important construct when analyzing environmental-friendly disposal behaviors. The finding also indicates that the construct of perceived consumer effectiveness can be temporarily activated through priming, which could implicate that supraliminal messages of effectiveness have the power of influencing consumers to engage in reducing and reusing waste.

Second, it shows that the construct of perceived consumer effectiveness can be manipulated as an informational text (informed consumer effectiveness). Nevertheless, contradicting the above-mentioned result and relevant literature on the positive effect of perceived consumer effectiveness on environmental friendly behavior, the effect of informed consumer effectiveness on the dependent variable was negative. This unintended consequence is inconsistent with some findings from the literature on self-efficacy, which states that verbal persuasion is an important source of self-efficacy (and perceived consumer effectiveness) because verbally communicating about the individuals' ability to succeed should strengthen the belief of mastering the targeted behavior (Bandura, 1977) and consequently the intention of performing this behavior.

The ramifications of this finding led to the third contribution of this thesis: that the negative impact of informed consumer effectiveness on willingness to reuse products and

reduce waste can be explained via appraisals, based on the Theory of Cognitive Dissonance. The theory suggests that cognitive inconsistency resulted by appraisals elicit negative emotions (Harmon-Jones, 2000). In the case of informed consumer effectiveness, individuals were exposed to information about their ineffectiveness of reducing and reusing waste, which might have been dissonant to their own beliefs, values, and attitudes. The results of the appraisals of informed consumer effectiveness indicated that the low condition elicited a negative emotion, in particular anger (in regard to most but not all dimensions of appraisal), that has the motivational power of taking action to reduce the feeling of discomfort. Anger was consequently implemented in the proposed model which stated that: high (low) informed consumer effectiveness decreases (increases) anger, which in turn positively related to willingness to reuse products and reduce waste. This finding also contributes in a small extent to the area of emotion in consumer behavior and consumer psychology. Although emotions are an important topic to be researched because of their power to predict behavior, research on the use of emotion has seen a decrease. According to Gaur, Herjanto, and Makkar (2014), who reviewed the emotions research within the marketing field from 2002 to 2013, the number of emotion-related articles in consumer behavior and consumer psychology declined since 2011.

Fourth, this thesis adds to the existing research stream of consideration of immediate and future consequences in an environmental scope. The results showed that the impact of informed effectiveness on behavioral intentions related to disposal behavior (product reuse and waste reduction) is indirectly influenced by the immediate dimension of this temporal construct, indicating that this influence holds true to individuals with low (vs. high) consideration of immediate consequences.

Lastly, this research contributes to the discussion of whether sustainable behavior is a function of age, gender, educational background, and income besides psychographic measures. Inconsistent results across Studies 1–6 strengthen the idea that sustainable behavior is not

reliably predicted by demographics across contexts, such as countries and population groups. Early environmental research (Antil, 1984; Berkowitz & Lutterman, 1968; Webster, 1975) sustained this idea because of marketing purposes: it was easier to target the sustainable consumer by identifying this consumer with objective measures such as age and gender. The current complexity of the determinants of sustainable and environmental behavior includes the need for a broad array of subjective factors, and therefore the sustainable consumer should also be studied under a subjective lens.

7.3 Managerial Implications

Informing and educating consumers have been two of the main tasks of organizations in order to promote behavioral change (Grunert & Thøgersen, 2005). Although there is a lack of clear results from these efforts, this signalizes that it is important to understand how to inform and educate consumers more effectively. Collectively, the findings from Studies 1–6 suggest that communications in environmental campaigns and advertising should consider the use of perceived consumer effectiveness to promote change in behavior.

One implication drawn from this thesis is that policy implementation and decisions might need to consider the level of perceived consumer effectiveness being highlighted in environmental campaigns and advertising. Prior research suggests that the higher the perceived consumer effectiveness, the higher the likelihood of engaging in pro-environmental behavior. The results here presented suggest the contrary: the higher the informed consumer effectiveness, the lower the tendency of behaving environmental-friendly. This is due to the fact that how individuals appraise the information has an impact on their behavior. For example, the results indicate that higher (vs. lower) informed consumer effectiveness has a negative (positive) effect on willingness to reuse products and reduce waste. As such, environmental policies might be

more persuasive when transparently communicating the lack of effectiveness of individual efforts towards the solution of waste generation. This would lead individuals to experience negative emotion and consequently be more motivated to change. This may be especially true for short-term campaigns, as there is no evidence on how the behavioral change is when individuals are constantly exposed to such message. Therefore, a general implication for public policy makers and pro-environmental campaign managers is that perceived effectiveness should be used parsimoniously, as its persuasive power depends on negative emotions as motivators for action.

In addition, policy makers should take into account the temporal personality of the audience when communicating policies and motivating a change in behavior with regards to disposal behavior. An example given in this thesis is that the impact of informed consumer effectiveness on willingness to reuse products and reduce waste was stronger for people with low (vs. high) levels of consideration of immediate consequences. When addressing consumers who have low consideration of immediate consequences, public policy makers should not make them feel that their actions are sufficient. These persons have to be reminded that future generations can only be preserved by repetitive environmentally friendly intentions that lead to action.

7.4 Limitations and Outlook

The studies here presented are not without limitations, which grants opportunity for future research. Behavioral intention measures were self-reported, giving room for social desired answers when talking about disposal behavior. Individuals who do not reduce waste or reuse products might respond otherwise to avoid being judged by other people. Therefore, one suggestion for future research would be that future studies focus on an observational measure in a natural setting, in order to assure that the actual behavior is being performed and to exclude the influence of social desirability. The challenge here is to capture the actual disposal behavior

when the individual feels there is nobody watching (or checking after the study has ended), as research already showed that the presence of potential observers might already lead to a socially desirable behavior (ex. littering behavior in a cafeteria when feeling watched; Bateson, Callow, Holmes, Redmond Roche, & Nettle, 2013; Ernest-Jones, Nettle, & Bateson, 2011).

The studies presented here used a fictitious manipulation of perceived consumer effectiveness. Future research should assess the impact of actual environment campaigns that uses perceived consumer effectiveness on environmental-friendly disposal behavior. Furthermore, it should assess the longitudinal effects of informed consumer effectiveness. Since low informed consumer effectiveness increases willingness to reuse products and reduce waste via anger, the consistent exposure of such advertising or campaign might lead to compassion fatigue. This is already seen in the frequent use of shock advertising, generating indifference to appeals presented.

8 Conclusions

From a sustainability perspective, there is an urgency to push organizations and individuals to produce and consume in an environmental friendly way. This thesis attempts to address consumer behavior in a wider scope, by assessing sustainable disposal behavior. Specifically, it gives insights into the role of perceived consumer effectiveness on willingness to reduce waste and reuse products. On the one hand, it provides evidence that persuasive communication in the environmental context can be achieved by implementing messages about consumer ineffectiveness in reducing waste. These messages, however, can cause negative emotions, which can then act as motivators for the intended attitude or behavior. On the other hand, informing consumers that they are effective already is dangerous, particularly when the target audience feels that immediate outcomes are more important than future outcomes. These findings show that there is an opportunity to influence positive changes with regards to environmental-friendly disposal behavior.

Nevertheless, focusing solely on the individual is not enough in order to combat environmental problems. As Thøgersen and Crompton (2009, p. 159) suggest: “The cumulative impact of large numbers of individuals making marginal improvements in their environmental impact will be a marginal collective improvement in environmental impact”. In order to promote change, the different pillars of society (individuals, government and businesses) have to work together and motivate and sustain change through public policy initiatives. Only then will systems distance themselves from the prevailing dominant social paradigm characterized by the belief that the Earth supplies unlimited resources for progress.

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Appendix A – Descriptive statistics for willingness to reduce waste and reuse products (Studies 1, 2, 3, 5 and 6)

How willing are you to take the following actions? (from 1 – very unwilling to 5 – very willing)

	<i>Study 1</i>		<i>Study 2</i>		<i>Study 3</i>		<i>Study 5</i>		<i>Study 6</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>Willingness to reduce waste</i>										
Reduce the amount of produce that's bought which has lots of packaging.	3.87	1.19	3.80	1.06	4.03	1.17	4.20	1.03	3.95	1.01
Take old plastic bags shopping, rather than using new ones, or take a durable bag	3.75	1.26	4.74	0.62	4.14	1.18	4.29	1.04	4.17	0.99
Look for wrapping that can be easily reused or recycled	3.70	1.17	3.61	1.16	4.18	1.11	4.35	0.96	3.96	1.07
Buying certain products without packaging, like fruit and vegetable	4.20	1.02	4.27	0.86	4.31	1.11	4.36	0.92	4.25	0.90
Buying few disposable products	3.78	1.14	3.63	0.97	3.73	1.24	3.46	1.42	3.99	0.96
<i>Willingness to reuse products</i>										
Repairing items before deciding they have to be thrown away	4.21	0.94	4.09	0.95	4.37	1.14	4.55	0.82	4.26	0.85
Reuse paper, rather than buying it new	3.61	1.17	3.66	1.19	3.92	1.37	4.12	1.09	3.99	1.05
Reusing jars and bottles wherever possible	4.10	1.05	4.25	1.04	4.49	0.95	4.58	0.82	4.29	0.90
Wash and reuse certain items before disposing of them, like dishcloths	4.28	0.97	4.25	0.98	4.47	0.97	4.53	0.85	4.25	0.89
Reuse old container, like ice cream tubs or margarine boxes	3.89	1.17	3.22	1.34	4.57	0.94	4.59	0.82	3.98	1.12

Note. Since Studies 2–5 were experimental studies, the means cannot be interpreted without the consideration of these manipulations. See Appendices C and D for the manipulations. Overall means are presented in the table.

Appendix B – Descriptive statistics for perceived consumer effectiveness (Study 1)

	<i>M</i>	<i>SD</i>
I can do a lot to reduce the impact of pollution.	3.43	1.01
When I buy products, I try to consider how my use of them will affect the environment and other consumers.	3.33	1.02
I feel I can help solve natural resource problems by conserving energy.	3.60	1.04
Each consumer can have a positive effect on society by purchasing products sold by socially responsible companies.	3.80	0.90


Note. Items measured in a scale from 1 – completely disagree to 5 – completely agree

Appendix C – Sentence scramble tasks (Study 2)

Example of sentence scramble task for high perceived effectiveness

Now, please solve the following sentence scramble task. Please put the correct order for the following sentence:

There
is
much
I
can
do
about
the
environment.




The three sentences used for high perceived effectiveness priming were: There is much I can do about the environment; I can do a lot to reduce the impact of pollution; I can help solve natural resource problems by conserving energy.

Example of sentence scramble task for low perceived effectiveness

Now, please solve the following sentence scramble task. Please put the correct order for the following sentence:

There
isn't
much
I
can
do
about
the
environment.



The three sentences used for low perceived effectiveness priming were: There isn't much I can do about the environment; I cannot do a lot to reduce the impact of pollution; I cannot help solve natural resource problems by conserving energy.

Appendix D – Manipulation used in Studies 3, 4, 5, and 6

D1: Consumers are highly effective in producing less waste

According to United Nation’s development specialist John Gregory, the amount of garbage is rising fast. He warned that global solid waste generation would increase by 70 percent until 2025, generating more than 6 million tons of waste per day. The waste from cities alone is already enough to fill a line of trash trucks 5,000 kilometers long every day.

Experts claim that **consumers** are the **primarily responsible** for this garbage production. This means that consumers are also the main contributors to cut down this waste volume, and can do much to help the environment. Compared to manufacturers, **consumers are much more effective** in reducing the amount of waste. In fact, surveys indicate that consumer actions (for example, reusing bottles and bottles, taking reusable bags for shopping, and buying products with less packaging) have the potential to effectively reduce the amount of waste in the world.

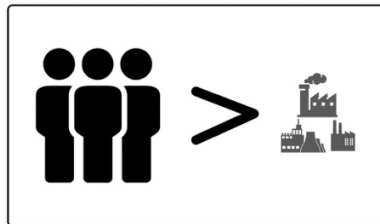


Figure: Consumers are the main contributors in reducing waste

D2: Consumers are highly ineffective in producing less waste

According to United Nation's development specialist John Gregory, the amount of garbage is rising fast. He warned that global solid waste generation would increase by 70 percent until 2025, generating more than 6 million tons of waste per day. The waste from cities alone is already enough to fill a line of trash trucks 5,000 kilometers long every day.

Experts claim that **industries** are the **primarily responsible** for this garbage production.

Consumers are not the main contributors to cut down this waste volume, and therefore contribute little to help protect the environment. Compared to manufacturers, **consumers are much less effective** in reducing this amount waste. In fact, surveys indicate that consumer actions have little potential to effectively reduce the amount of waste in the world. On the other hand, manufacturers can change their way of production to reduce waste, such as selling reusable products, disposing of plastic bags at groceries and reducing packaging.

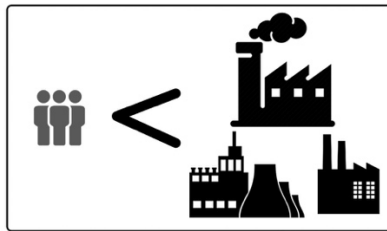


Figure: Consumers are not the main contributors in reducing waste

Appendix E – Operationalization of appraisals (Study 4)

Construct	Operationalization Study 4	Anchor (from 1 to 7)
Situational state	<p>Do you think that being effective/ineffective and reducing/not reducing waste is inconsistent with what you want or consistent with what you want?</p> <p>Do you believe that being effective/ineffective and reducing/not reducing waste got worse or improved?</p> <p>Do you think that being effective/ineffective and reducing/not reducing waste is unwanted by you or wanted by you?</p>	<p>Very much inconsistent with what I want - very much consistent with what I want</p> <p>Very much made things worse – very much improved things</p> <p>Very much unwanted – very much wanted</p>
Motivational state	<p>Your reaction to the message - of being effective/ineffective and reducing/not reducing waste - was mostly because you wanted to get rid of or avoid something painful or mostly because you wanted to get or keep something pleasurable?</p> <p>While reading the message (of being effective/ineffective and reducing/not reducing waste), did you want to minimize some cost or maximize some benefit?</p> <p>While reading the message (of being effective/ineffective and reducing/not reducing waste), were you seeking less of something negative or more of something positive?</p>	<p>Mostly because I wanted to get rid of or avoid something painful - mostly because I wanted to get or keep something pleasurable</p> <p>Very much wanted to minimize some cost – very much wanted to maximize some benefit</p> <p>Very much seeking less of something negative – very much seeking more of something positive</p>
Probability	<p>How well could you predict what happens by being effective/ineffective and reducing/not reducing waste?</p> <p>How uncertain were you about what are the consequences of being effective/ineffective and reducing/not reducing waste?</p> <p>How much were you in doubt about what was actually occurring (regarding being effective/ineffective and reducing/not reducing waste)?</p>	<p>Not at all - very well</p> <p>Not at all uncertain – very uncertain</p> <p>Not at all in doubt – very much in doubt</p>
Power	<p>When thinking about being effective/ineffective and reducing/not reducing waste, did you feel powerless or powerful?</p> <p>When thinking about being effective/ineffective and reducing/not reducing waste, did you feel that you were weak or strong?</p> <p>When thinking about being effective/ineffective and reducing/not reducing waste, did you believe that you were unable to cope or that you were able to cope?</p>	<p>Very powerless - very powerful</p> <p>Very weak – very strong</p> <p>Very much unable to cope – very much able to cope</p>
Legitimacy	<p>When thinking about being effective/ineffective and reducing/not reducing waste, did you believe that there was an injustice to you?</p> <p>When thinking about being effective/ineffective and reducing/not reducing waste, did you believe that you deserve for something bad to happen, or for something good to happen?</p> <p>When thinking about being effective/ineffective and reducing/not reducing waste, did you think of yourself as morally right or morally wrong?</p>	<p>Not at all an injustice to me - very much an injustice to me</p> <p>Very much deserved for something bad to happen – very much deserved for something good to happen</p> <p>Very much morally right – very much morally wrong</p>

(continued)

Appendix E – Operationalization of appraisals (Study 4) (continued)

Construct	Operationalization Study 4	Anchor (from 1 to 7)
Agency	While reading the text, how much did you think that being effective/ineffective and reducing/not reducing waste was caused by circumstance beyond anyone's control?;	Not at all caused by circumstances beyond anyone's control - very much caused by circumstances beyond anyone's control
	While reading the text, how much did you think that being effective/ineffective and reducing/not reducing waste was caused by someone else?	Not at all caused by someone else – very much caused by someone else
	While reading the text, how much did you think that being effective/ineffective and reducing/not reducing waste was caused by you?	Not at all caused by me – very much caused by me

**Appendix F – Descriptive statistics for immediate and future consequences items
(Study 6)**

	<i>M</i>	<i>SD</i>
<i>Consideration of immediate consequences</i>		
I only act to satisfy immediate concerns, figuring the future will take care of itself.	2.57	1.20
My behavior is only influenced by the immediate concerns, figuring the future will take care of itself.	2.63	1.18
My behavior is only influenced by the immediate (i.e., a matter of days and weeks) outcomes of my actions.	2.64	1.13
My convenience is a big factor in the decisions I make or the actions I take	3.25	1.07
I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level.	2.46	1.16
I think that sacrificing now is usually unnecessary since future outcomes can be dealt with at a later time	2.49	1.17
I only act to satisfy immediate concerns, figuring that I will take care of future problems that may occur at a later date.	2.62	1.15
<i>Consideration of future consequences</i>		
I consider how things might be in the future, and try to influence those things with my day to day behavior.	3.88	.81
Often I engage in a particular behavior in order to achieve outcomes that may not result for many years.	3.64	.90
I am willing to sacrifice my immediate happiness or well-being in order to achieve future outcomes.	3.85	.86
I think it is important to take warnings about negative outcomes seriously even if the negative outcomes will not occur for many years.	4.08	.85
I think it is more important to perform a behavior with important distant consequences than a behavior with less important immediate consequences.	3.73	.84
When I make a decision, I think about how it might affect me in the future.	3.99	.82
My behavior is generally influenced by future consequences.	3.81	.86

Note. Items measured in a scale from 1 – completely disagree to 5 – completely agree

