

How Can We Increase the Rate At Which Individuals Recycle Using Behavioral Heuristics?

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Abstract

Recycling in most people’s minds is the act of creating new commodities from old and unusable materials which would otherwise become waste. Recycling involves intricate processes and rigorous planning by local, national, and international authorities and may take a lot of time to implement. However, there are instances where the “recycling infrastructure” is present, but individuals do not partake in the process—which is the most critical step. In this paper, behavioral economics heuristics of status quo bias, choice overload, and framing effect will be utilized to explain why individuals do not recycle when they are given the opportunity and resources to do so, and similarly, solutions will be presented which involve said heuristics.

1 Introduction

The topic of recycling and methods of increasing the rate at which individuals recycle has been discussed and researched heavily for the past decades. With the urgency of the climate crisis and the rapid expansion of consumption-oriented industries, recycling and reusable products have become more mainstream. However, the use of products such as recyclable plastic bags and biodegradable coffee cups is still widespread. The World Bank reports that the world generates around 2.01 billion tons of solid waste annually—of which only 19% is being recovered through recycling and composting [Wor].

Many national and local governments, with the hopes of increasing the rate at which individuals and communities recycle, have been enacting policies, regulations, and programs to varying degrees of success. These direct acts of “intervention” are mostly composed of putting sorting bins in neighborhoods for recyclable and compostable waste after which the only effort by these authorities is to broadcast the implementation of these sorting bins with no other follow-up action or initiative. As a result, these initiatives mostly fail or don’t end up with the desired outcomes due to A), contamination in the recycling stream B),

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widespread shutdowns of recycling centers around the world, or C), low rates of participation amongst the public [Kat19, Ame]. The third reason is the one that will be discussed in this paper with the help of behavioral economics and behavioral biases which will try to both explain and resolve the question of increasing the rates at which individuals recycle.

1.1 Review of Previous Literature

Since the conception of behavioral economics, behavioral heuristics and cognitive mechanisms have been used with varying degrees of success in policymaking and social reform. Environmental initiatives that aim to promote practices such as recycling have also frequently been an area of study for many researchers. For the scope of this paper, four important experiments conducted by researchers targeting different behavioral heuristics where the results were both positive and negative will be analyzed.

In their paper, Linder and his colleagues designed a natural field experiment in Hökarängen, a city district in southern Stockholm, Sweden, where they used leaflets to organize an information-based campaign to “reduce the amount of household waste collected from sorting stations” [LLB18]. Many households in Hökarängen hadn’t had the opportunity to recycle their food waste until 2014. This changed when the local municipality started a project where they installed stationary sorting stations outside their apartment complexes. Although these bins were present for over more than a year before the experiments started, Linder and his colleagues determined that not many households had been using them. Linder and his colleagues first decided upon the behavior that they were aiming to change, which was “promoting pro-environmental behavior of recycling food waste” [LLB18]. They then organized surveys and interviews with local residents who were considered as community leaders/insiders to better understand why the residents had not been using the stationary sorting bins which were abundant and easily accessible for many to address these reasons with their information campaign. The main reasons were:

1. People didn’t know about these sorting bins,
2. They weren’t able to tell the difference between the sorting bins for food and household waste,
3. They were confused and couldn’t understand the information regarding recycling,
4. They didn’t believe that the garbage trucks were collecting the bins separately (i.e. separating food and household waste),
5. They thought that recycling was an inconvenience,
6. Laziness,
7. They didn’t have the brown compostable bags necessary for recycling.

After they determined the main reasons for the residents’ lack of recycling, they started to design the leaflets. On the front page of the leaflet, they put a large photograph of the sorting bins to help prevent the mix-up with other waste bins. Citing previous research pertaining to the use of descriptive norms and their positive yields in environmental studies, Linder and his colleagues decided to use a slogan that translates to English as: “Join your neighbors at Hovmästargatan, recycle your food waste!” [LLB18]. Linder and his colleagues then delivered the leaflets to the treatment group of the experiment with 2 biodegradable bags which some residents cited whose lack was a reason they didn’t recycle. For 8 months, they recorded the amount of household and food waste collected for both the control and treatment groups. They observed that at the end of the 8 months, the rate of food waste recycling had significantly increased and in parallel, the rate of household waste had also decreased compared to the control group [LLB18].

Nolan and her colleagues took a similar approach to addressing environmental issues, this time focusing on energy conservation. In their paper, they first decided to conduct a preliminary study where they tried to see how people’s beliefs about their motives for energy conservation correlate with the actual factors that lead them to conserve energy. For this, they created a survey where they asked participants several questions about both their self-reported rate of energy conservation and also factors that motivated them to do so. They then tried to measure how much weight participants gave to social norms, where they self-reported conserving energy more due to reasons such as “saving the environment” and “ensuring a happy future for their children” rather than for reasons such as “the behaviors of other leading them to do so” [NSC⁺08]. However, in the 2nd part of the study, they conducted an experiment where they hung door hangers to the doors of consenting parties with different messages on them related to the 5 conditions being studied. These conditions were:

1. Information only: participants were only told that they could save energy if they followed the instructions stated,
2. Descriptive norm,
3. Self-interest,
4. Environment,
5. Social responsibility.

The latter 4 also contained motivational information such as “99% of people in your community reported turning off unnecessary lights to save energy” [NSC⁺08]. Later, a party of surveyors visited the participants and asked them several questions about how much the door hangers had motivated them to conserve energy. After the survey, with the consent of the participants, when their household energy bills were observed, an interesting pattern emerged: Participants who self-reported as being least motivated were the ones who received the door hanger with the descriptive norm but had conserved more out of all

5 conditions. Showing that although participants believed the descriptive norm to affect their behavior the least, they had been affected on the contrary. Nolan and her colleagues conclude by saying that “normative information spurred people to conserve more energy than any of the standard appeals that are often used to stimulate energy conservation, such as protecting the environment, being socially responsible, or even saving money.” [NSC⁺08]. Thus, highlighting the prominence of social norms when addressing social issues such as the environment and conserving energy.

Cialdini expands further upon the concept of social norms and defines “Injunctive” and “Descriptive” norms as:

- Injunctive norms: Involving perceptions of which behaviors are typically approved or disapproved.
- Descriptive norms: Involving perceptions of which behaviors are typically performed.

He then continues to elaborate on several experiments which were previously conducted and which he conducted to explain the relationship between the possible positive and negative effects of these norms when utilized in PSAs (Public Service Announcements) and experiments. In his first experiment, Cialdini and his colleagues use a confederate¹ to litter in 2 environments when driving by—one being fully littered and one being previously clean. They then observe the behavior of passers-by and try to emerge a pattern. To this end, Cialdini and his colleagues have 3 predictions:

1. The passers-by would be more likely to litter in the already littered environment than in the clean one,
2. The passers-by who saw the confederate would be more likely to litter because they had been exposed to a pro-littering descriptive norm,
3. The passers-by who saw the confederate litter in a clean environment would be least likely to litter because they would be exposed to an anti-littering norm—where the confederate is the only person who litters in a setting in which people generally don’t litter.

In conducting the experiment, Cialdini and his colleagues do observe that their hypotheses are correct.

In another experiment, Cialdini tries to prove the weakness of the descriptive norm when present in an environment with high levels of behavior that is not socially accepted. Cialdini uses 2 different PSA posters in a national park where visitors steal petrified wood: One focuses on the amount of petrified wood stolen but does not condemn the act and in the other, the act itself is condemned rather than remarking upon how prevalent it is. Once again, Cialdini observes that his hypothesis regarding the use of the injunctive norm instead of the descriptive

¹Confederate: In an experimental situation, an aide of the experimenter who poses as a participant but whose behavior is rehearsed prior to the experiment.

norm where high numbers of undesirable actions are present is more beneficial, is correct.

Lastly, Cialdini questions whether or not one norm should be traded for the other in PSA design. He concedes that even though using descriptive norms is detrimental when environmentally harmful behavior is widespread, its incorporation would be effective when the widespread behavior is environmentally beneficial. To this end, he says: “For example, if the majority of citizens conserve energy at home, campaign developers would be well advised to include such descriptive normative information in their presentations intended to increase residential energy conservation. Of course, if the majority of citizens also approve of such efforts, the campaign developers would be wise to incorporate this injunctive normative information as well. Thus, the most effective norm-based persuasive approach under these circumstances would enlist the conjoint influence of descriptive and injunctive norms.” [Cia03].

Cialdini ends his paper by taking into question the effectiveness of the mediums in which PSAs are delivered. He postulates that because most mediums of PSA transmission such as TVs, radios, and print are far removed opportunities to perform the socially desirable actions that they try to promote, the message they try to convey is no longer present [Cia03].

The last experiment which will be discussed as a part of this paper is the supermarket experiment conducted by Ohtomo and Ohnuma to investigate the reduction of plastic bag usage. In the first week of the experiment, the control group, shoppers were given free bags by the cashier. In the second week of the treatment, shoppers were verbally asked whether they would like a plastic bag. Per their prediction, the number of plastic bags used was observably reduced since shoppers had to pause and consider whether they needed a plastic bag—which was not the case when they were directly handed the plastic bag [OO14].

1.2 Brief Background & Motivation

In the following chapters of the paper, we will be discussing several behavioral heuristics that trigger low recycling rates in given test groups as well as several heuristics that can be used to increase the rates at which they recycle.

As evident from the review of past literature, many experiments, observational studies, and subsequent postulations have been made in terms of environmental policymaking that promotes green solutions such as increased recycling rates, reduction of energy, and littering. However, studies that incorporate behavioral heuristics to explain said behavior and try to exploit them, per se, to result in positive outcomes have not been as prominent. Regardless, it is possible to draw solid conclusions from these experiments regarding what kind of behavioral heuristics are in play as the experiments were conducted under behavioral frameworks and taking into account the principles of behavioral economics experimentation.

2 Discussion

2.1 Status Quo Bias as a Trigger

Status quo bias is a behavioral heuristic that occurs when people prefer things to stay the same by doing nothing or by sticking with a decision that they had made previously [SZ88]. Individuals affected by status quo bias may choose to keep things “as is” even if changing their current state of affairs might yield greater utility in the near future. When it comes to recycling and recycling behavior, clear conclusions can be drawn from previous experiments regarding how status quo bias is a trigger for low recycling rates.

In Cialdini’s paper, the significance of social norms and descriptive social norms, in particular, was seen. Circumstances, where the actions of individuals help create descriptive social norms for other individuals, have resulted in behavior that is parallel to the norm created. With the presence of social norms and how descriptive social norms drive human behavior, we can combine Linder and his colleagues’ research with Cialdini’s to deduce how individuals tend to not recycle even if they have the opportunity to do so because they believe it is the “social norm” (i.e. their mind has accepted the descriptive social norm that not recycling is more popular among the person’s community). When Linder and his colleagues were trying to deduce why individuals don’t recycle, some conclusion they made was that they do not do so because of “laziness” and “they thought recycling was an inconvenience” [LLB18]. Some testimonials made by the interviewees in Linder and his colleagues’ experiment are:

- “Not enough space for another garbage bag”,
- “Living alone means a very small amount of food waste, and I need to keep track of having compostable bags”,
- “I walk with a crutch, so I can only carry one bag at the time”.

Excluding the participant with crutches, we can observe that even though these individuals can recycle with small and insignificant changes in their lives, they don’t “go the extra mile” and recycle because they don’t feel the necessity to do so and also because they too believe the descriptive social norm that recycling is not common. It might be possible that individuals believe such norms because they either don’t have any outside trigger to convince them any other way (i.e. leaflets telling them recycling is widespread in their community) or because they don’t want to change their state of affairs and have convinced themselves that recycling is already not common so the “status quo” is to not recycle as well.

2.2 Status Quo Bias as a Solution

Status quo bias, despite being a trigger for low recycling rates, can be exploited as it has indirectly been done so in previous experiments to increase recycling

rates. In Ohtomo and Ohnuma’s experiment, consumer behavior was affected by the defaults created (i.e. the status quo). In the control group, the default was to be given a plastic bag and in the treatment group, it was to be asked if you want or don’t want one. Most participants tended to maintain the status quo of using the plastic bag instead of not taking it only because they were given one in the first place. However, when the status quo was changed to being asked whether they want one or not, the participants had to stop, think, then decide their action.

Similarly, if the status quo in a given community is to recycle, then it would be logical to conclude that most individuals would sooner or later conform to the prevalent sentiment of recycling. Yet, to ensure this, behavioral interventions such as leaflet campaigns may be necessary as done in Linder and his colleague’s experiment.

The reason for such behavior observed in the 2 experiments can again be connected to the presence, or creation, of social norms. In Ohtomo and Ohnuma’s experiment, the status quo created by making the shoppers pause and think, indicates to them that the socially normal behavior (the descriptive norm) is not to take a bag and taking a bag is an exception—prompting the cashier to make sure if they want one regardless. And in Linder and his colleagues’ experiment, the descriptive norm created with information interventions serves to create a status quo implying pro-recycling behavior.

Leaflets and information interventions would be useful in communities where the status quo is not to recycle. A false sense of status quo, per se, might be created via such campaigns. This once again is thanks to the use of descriptive social norms similar to the ones used by Cialdini in his confederate littering experiment.

2.3 Choice Overload as a Trigger

The phenomenon of choice overload occurs as a result of too many choices being available to consumers [Vee05]. Choice overload may result in status quo bias and result in no decision, i.e. the choice of the default option (the status quo). Referring back to the experiment conducted by Linder and his colleagues, one reason given for not choosing to recycle was: “Can’t tell the difference between the sorting stations.” [LLB18]. Most residents in the treatment either weren’t aware that the sorting bins were different from the waste bins for home waste or didn’t know what type of waste was supposed to be put in these sorting stations. This was evident because, in these sorting stations, there was an abundance of wrong trash such as mostly plastic bags and household waste. The sorting bins were put in place with the assumption that people would know that they have to only use them for food waste and these bins were different from normal household waste bins. Unfortunately, it can be observed that that was not the case. In cases where residents were unsure as to whether these were the correct bins, it is obvious that the presence of 2 bins with similar looks and minimal aesthetic differences made them commit to the default action of treating the bins as any ordinary household waste bin—typical behavior observed when people

aren't able to make simple computations necessary to perform a task.

Although research on the effects of numerous recycling bins for each waste (i.e. 5-6 different bins for different wastes such as plastics, metals, paper, etc.) and bins that can take a large array of wastes and how they trigger choice overload is not conducted, it would surely be interesting and beneficial to dig deeper into the topic.

2.4 Framing Effect as a Solution

The framing effect argues that depending on how information is presented to people, the actions that they take or the effect a piece of information has on them will vary. Tversky and Kahneman describe it as: "We use the term 'decision frame'" to refer to the decision-maker's conception of the acts, outcomes, and contingencies associated with a particular choice. The frame that a decision-maker adopts is controlled partly by the formulation of the problem and partly by the norms, habits, and personal characteristics of the decision-maker" [TK81].

In Nolan and her colleagues' experiment, we can clearly observe how framing affects individual behavior in environmental issues. The 5 different conditions that the door hangers represented were all different ways in which the same message was framed: "Use less energy". The experiment clearly showed that one type of information intervention/framing of information was superior to all others: Information framing which involves descriptive norms [NSC⁺08]. These frames, although, again, evident from the experiment, are consciously rejected by participants as not having any significance on them, subconsciously, it is the strongest driving force among all. Taking this into account, Linder and his colleagues also created their leaflet with information that is framed around descriptive norms. Instead of using a framework such as "Recycle, because it is beneficial for you and your children", they chose the slogan: "Join your neighbors at Hovmästargatan, recycle your food waste!". As a result, their experiment yielded positive results where the treatment group had a lower rate of household waste and a higher rate of recycled food waste [LLB18].

Moreover, in Cialdini's 2nd experiment about preventing petrified wood theft in a national park, he too vividly showed how framing can be used in environmental action policy design. He showed that when designing campaigns and policies, it is important to note that sometimes, injunctive norms may be superior to descriptive norms because they offer better frames of the situation [Cia03].

In return, the framing effect has great potential when it comes to organizing environmental action campaigns and can yield amazing results if utilized correctly for recycling campaigns as well, as it has for Linder and his colleagues.

3 Conclusion

The use of a behavioral lens to assess daily life and societal problems has great potential for not only understanding the human psyche but also for better accommodating it. As elaborated, even though many behavioral heuristics are used in policy creation, sometimes, they are not explicitly stated. In this paper, three of those two heuristics were used to address why low recycling rates are present in given environments and two were used to try and resolve them. Taking into account the number of experiments attributed and cited in this paper, the reliability of the remarks should also be considered parallel to that. Meaning, better experiments with a greater focus on behavioral heuristics would surely not only broaden the possibilities of finding solutions to the questions which were answered today but also might increase the chance of answering the questions of tomorrow.

This paper addressed what policies or initiatives might be enacted by authorities to incentivize individuals using behavioral methods rather than monetary or material incentives, however, it should also be noted that acts such as recycling should and must be conducted voluntarily and with a sense of duty in an ideal society. Excluding conditions where the act of recycling is impossible or greatly challenging for one, recycling is a moral duty for a member of society and should not be viewed as a luxury worth performing at convenience. We have to do our best as humans to provide for or at the very least take care of our only planet earth. Recycling is just a drop in the ocean.

In conclusion, the utilization of behavioral economics and behavioral heuristics might yield great results for societal progress if used correctly, but it must not be forgotten that society means nothing without individual effort, commitment, and trust.

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