WHITE PAPER

Nudging the loop closed:

A Behavioral Look at Consumer Circularity

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Introduction

Every year, approximately 150 million tons of valuable materials like metals, paper, organics, and plastics end up in landfills across the United States despite potential to be remade into new products or fuels. This linear model of disposal not only represents a waste of valuable resources but also impacts economic growth, hampers our domestic security, and threatens the environment.

Today, players across sectors — including durables, consumer packaged goods (CPGs), retailers, materials companies, waste managers, municipalities, and the federal government — are investing heavily in circularity infrastructure to reduce waste. In addition, around $20 billion has already been invested in circular economy technologies over the past five years.

Despite these capital inflows, achieving circularity remains challenging. Once a product leaves a company's hands, controlling its end-of-life outcomes is difficult. Circularity requires collaboration across the value chain to design, produce, distribute, use, collect, and process products in a circular manner.

Consumers, as end users, play a crucial role in closing the loop on circularity. Despite extensive recycling infrastructure, technology investments, and new initiatives, significant recyclable material is lost at the household level. According to The Recycling Partnership, 76% of residential recyclables are lost to trash in homes. This leakage is present in both disposable products, like packaging, and durable goods such as clothing, electronics, and appliances.

Companies looking to close the loop must therefore ask how they can invest in the consumer experience to make circularity easier to adopt and stick. We argue that companies can round out their circularity portfolio by leveraging **behavioral science and nudges** to understand why it is challenging for consumers to act, and how to improve end-of-life outcomes by enabling desired behaviors.

Why Nudge?

Although more than 90% of consumers claim that they would like to behave sustainably, less than half say they engage in recycling behaviors somewhat or more frequently according to a 2022 survey of 19,000 respondents by the BCG Center for Consumer Insights. In fact, less than 10% of plastics are recycled in the US. Consumers report time constraints, a lack of information or awareness, and the inconveniences that sustainability can entail as hindrances.

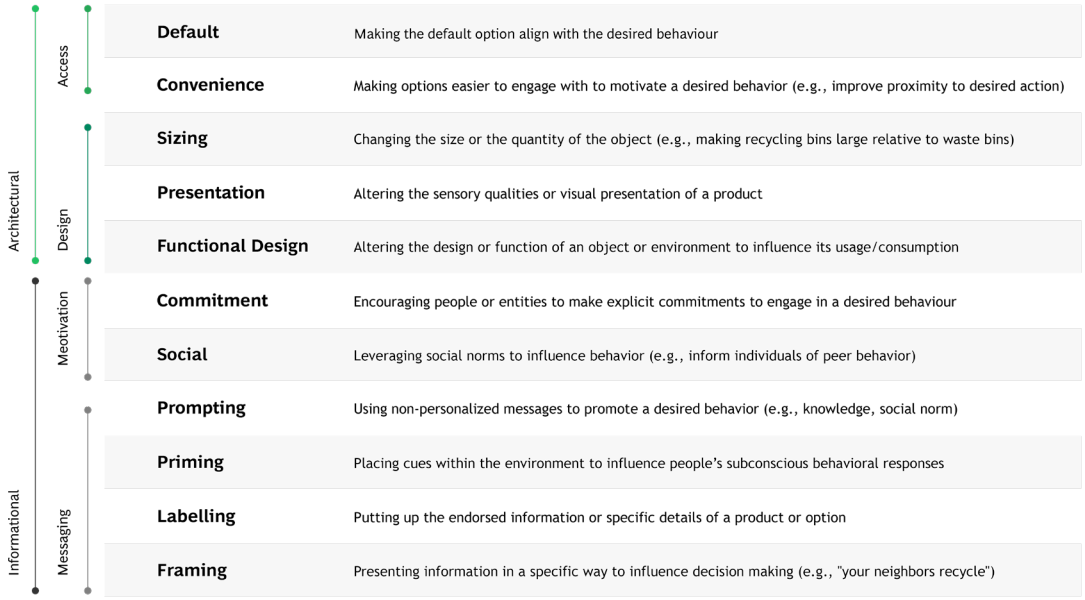
Nudges can help. Popularized by Richard Thaler and Cass Sunstein in Nudge: Improving Decisions About Health, Wealth, and Happiness, nudges are simple, typically inexpensive interventions that aim to alter consumer decision-making without offering substantial rewards or imposing unwelcome penalties. They can be particularly helpful in empowering people to solve problems that seem intellectually complex or abstract, like the environment. Companies can use nudges to enhance returns on circularity investments they are making in product design, material selection, and processing by improving their effectiveness.

Figure 1

Our Research

We reviewed more than 110 academic papers and 60 case studies and identified 11 levers for nudges that would improve consumer behavior. These fall into two categories of intervention: architectural nudges, and informational nudges. An overview of these levers is shown in Exhibit 1.

Exhibit 1: Levers for different nudges



Default	Making the default option align with the desired behaviour
Convenience	Making options easier to engage with to motivate a desired behavior (e.g., improve proximity to desired action)
Sizing	Changing the size or the quantity of the object (e.g., making recycling bins large relative to waste bins)
Presentation	Altering the sensory qualities or visual presentation of a product
Functional Design	Altering the design or function of an object or environment to influence its usage/consumption
Commitment	Encouraging people or entities to make explicit commitments to engage in a desired behaviour
Social	Leveraging social norms to influence behavior (e.g., inform individuals of peer behavior)
Prompting	Using non-personalized messages to promote a desired behavior (e.g., knowledge, social norm)
Priming	Placing cues within the environment to influence people's subconscious behavioral responses
Labelling	Putting up the endorsed information or specific details of a product or option
Framing	Presenting information in a specific way to influence decision making (e.g., "your neighbors recycle")

Exhibit 1 | 11 types of nudges can be used to address behavioral shortfalls and improve recycling effectiveness

Architectural interventions change consumer behavior by presenting options that shift the parameters of a decision and influence the outcome. In the case of consumer recycling behavior, architectural levers consist of changes to product access or design. Manufacturers and municipalities can change consumer access to recycling by increasing the convenience of recycling or even by making recycling the default option for disposal. For instance, the city of Vancouver increased recycling and composting rates by 141% by increasing the number of recycling and composting bins in high traffic areas of apartment buildings, placing them nearer to individual apartments rather than only on the ground floor.

Collectors can also utilize the design of recycling receptacles to draw the eye of consumers as they consider how to dispose of products at home, in the office, or on the go. The relative size, presentation, or functional design of recycling bins can also provide psychological cues to improve recycling behavior. Reducing the size of trash bins in Cornell University's administrative buildings relative to recycling bins reduced landfill waste by 55% and increased recycling adherence. Aesthetically pleasing containers may not be novel, but the addition of functional imagery or design can further enhance utilization.

Informational interventions provide additional context to consumers around their recycling decisions either through increasing societal motivation or directed messaging. Effective nudges in motivation for recycling are the making of commitments and the leveraging of social pressures. In an experiment conducted in Claremont in the 1980s, individual pledges collected by boy scouts led to a 31% increase in home recycling (Burn and Oskamp, 1986). Explicit, public commitments by both companies and members of the public can reinforce sustainable behavior and over time change social norms.

Effective recycling messaging ranges from public education campaigns to subtle indicators on recycling containers or recyclable goods. Public education or awareness efforts are labeling interventions, which recognize that repetitive information may be needed to educate the public, especially at the point of decision making. Prompting interventions are more focused efforts, such as gentle reminders that aim to encourage the right behavior at the right time, like trading in electronics at the end of their life.

Framing and priming are more subtle levers that invoke subconscious cues to act, such as positive language or strategic imagery. For example, a recent study found that adding a priming image of a human eye to recycling boxes decreased the rate of sorting errors from 10% to 3% (Lotti, Barile, and Manfredi, 2023).

Our research base shows that nudge-based interventions can improve targeted recycling behaviors by 5-30%, including recycling program participation rates, landfill diversion rates, and recycling contamination rates in programs with separate stream collection. Differing metrics make a single nudge efficacy metric hard to estimate, but Exhibit 2 shows a notable, consistent magnitude of impact for each lever observed in academic and business cases.

Figure 2

Exhibit 2: Impacts of nudging can be significant across levers

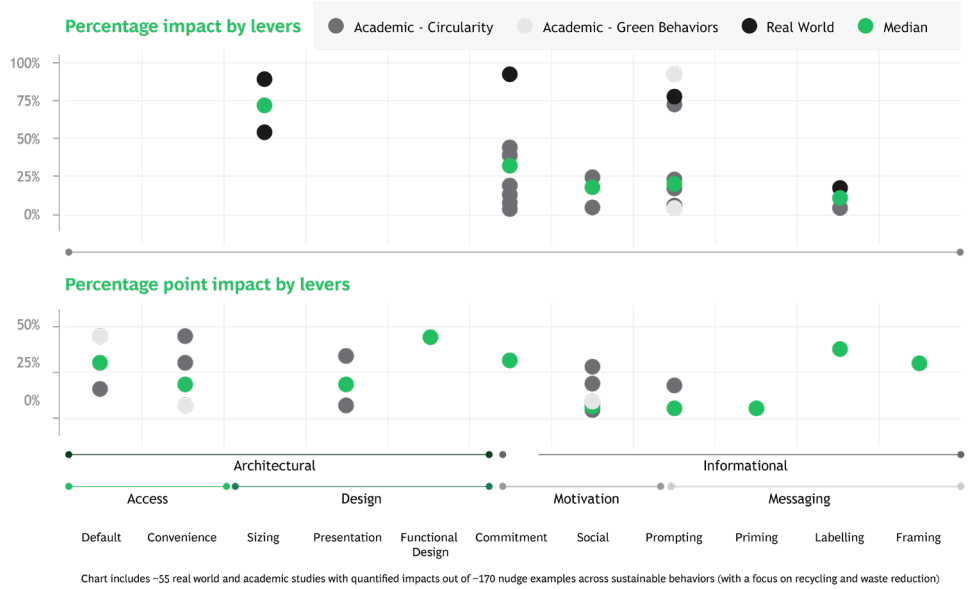


Exhibit 2 | Impacts of nudging can be significant across levers

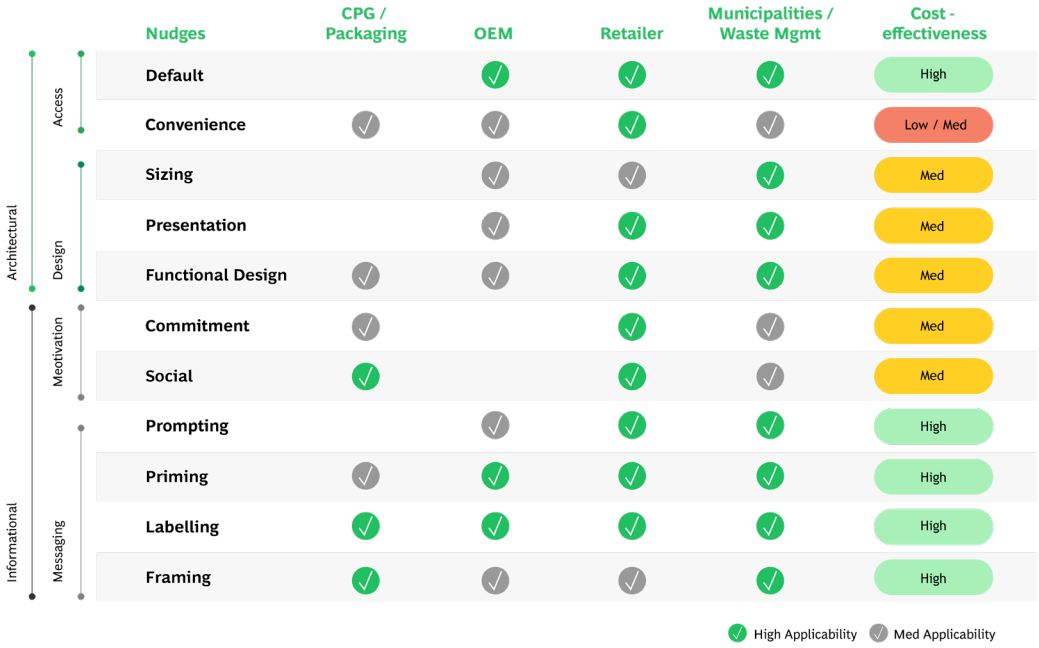
In the case studies we examined, nudges were often applied in combination. A clear trash bag mandate passed by the municipality of Halifax combined motivation and design nudges to increase the visibility of recycling efforts to a citizen's neighbors. The accompanying study reported a 15% increase in recycling and a 27% decrease in municipal solid waste as people adjusted their behavior (Akbulut-Yuksel, M., & Boulatoff, C. The Effects of a Green Nudge on Municipal Solid Waste: Evidence from a Clear Bag Policy).

Companies can also employ nudges to support more ambitious circularity initiatives. Groupe SEB, for example, has committed that its products should meet a circularity standard of "repairable for 15 years at a fair price." More than 90% of their electrical appliances meet this standard, supported by a global network of more than 6,500 authorized repair professionals who have access to dedicated spare parts. To achieve maximum impact from their investment by ensuring consumers utilize this service, Groupe SEB has used nudges to market their commitment, add relevant labeling to products, and increase the convenience of obtaining repairs.

Activation

Players across the value chain can adopt nudges to enhance circularity. (See Exhibit 3)

Exhibit 3: Nudging techniques are applicable across value chain roles



CPG and packaging companies can exert control over the design and marketing of products to nudge increased recycling at the end of product life. Reducing mixed materials in packaging increases recyclability without the need for extra work by consumers or municipalities, partly by enabling clearer labels. Packaging can also eliminate misleading signals of recyclability which confuse consumers, include statistics of recycling rates to encourage compliance, or positively frame recycling prompts around what a second life for a product can entail. For purely informational interventions, CPG companies can partner with municipalities to improve labeling and find ways to prompt consumers at point of disposal.

OEMs with more durable products have more complex options for circularity, including refurbishments and multi-step recycling instructions. Additional nudges available to encourage consumer participation include non-monetary rewards, point of sale reminders, and convenient take-back locations for durables to be repaired, refurbished, or recycled. Prompting at the end of product life can also be a highly effective nudge, informing consumers about proper disposal or the existence and location of take-back locations when the expected lifetime of their product is approaching.

Retailers have a crucial role to play in both informational and architectural interventions. Informational campaigns can reach beyond fliers and signs to leverage personalized channels for custom recycling plans, non-monetary rewards, and social media campaigns. Retailers can also place eye-catching recycling receptacles in visible locations, and in doing so remind consumers to come back with their recyclables. Finally, in-store associates can be trained to remind consumers at point of replacement of how to dispose of end-of-life products.

Finally, waste management companies and municipalities can apply a wide array of nudges at point of disposal. These include intuitive informational nudges to increase consumer engagement and build positive recycling norms. Social nudges can increase the visibility of recycling performance within a neighborhood, for example by affixing a large “oops” sticker to the receptables of frequent offenders, as the city of Cambridge has trialed. Architectural nudges such as increasing the size, color, and accessibility of recycling containers can also promote circular behaviors.

Recycling and compost facilities must be just as convenient and even more eye-catching than the trash for circular behaviors to be adopted.

How to make the most of circularity nudges in your business?

As companies grapple with the complexity of circular business models, they should be encouraged by the variety and efficacy of consumer behavioral nudges. Human behavior is often one of the largest sources of uncertainty in complex systems, but now there is the science to address such behavior directly. This article has introduced a range of behavioral interventions intended to increase consumer circularity, but it is companies and municipalities must drive these innovations forward.

Teams considering circularity initiatives should tackle the effort strategically.

Identify opportunities where behavioral interventions may overcome external barriers to an initiative.

Understand the underlying reasons why people are not behaving as expected.

Develop a targeted intervention strategy that is aligned across operational stakeholders and prioritizes the highest-value interventions.

Using a shortlist of nudge levers, design an intervention pilot to assess the impact on a key region or audience.

After the pilot is complete, consolidate core learnings and determine if the initiative makes sense at scale.

As successful initiatives are scaled, continue to gather information to improve operations and build success stories to celebrate consumer circularity.

Acknowledgement

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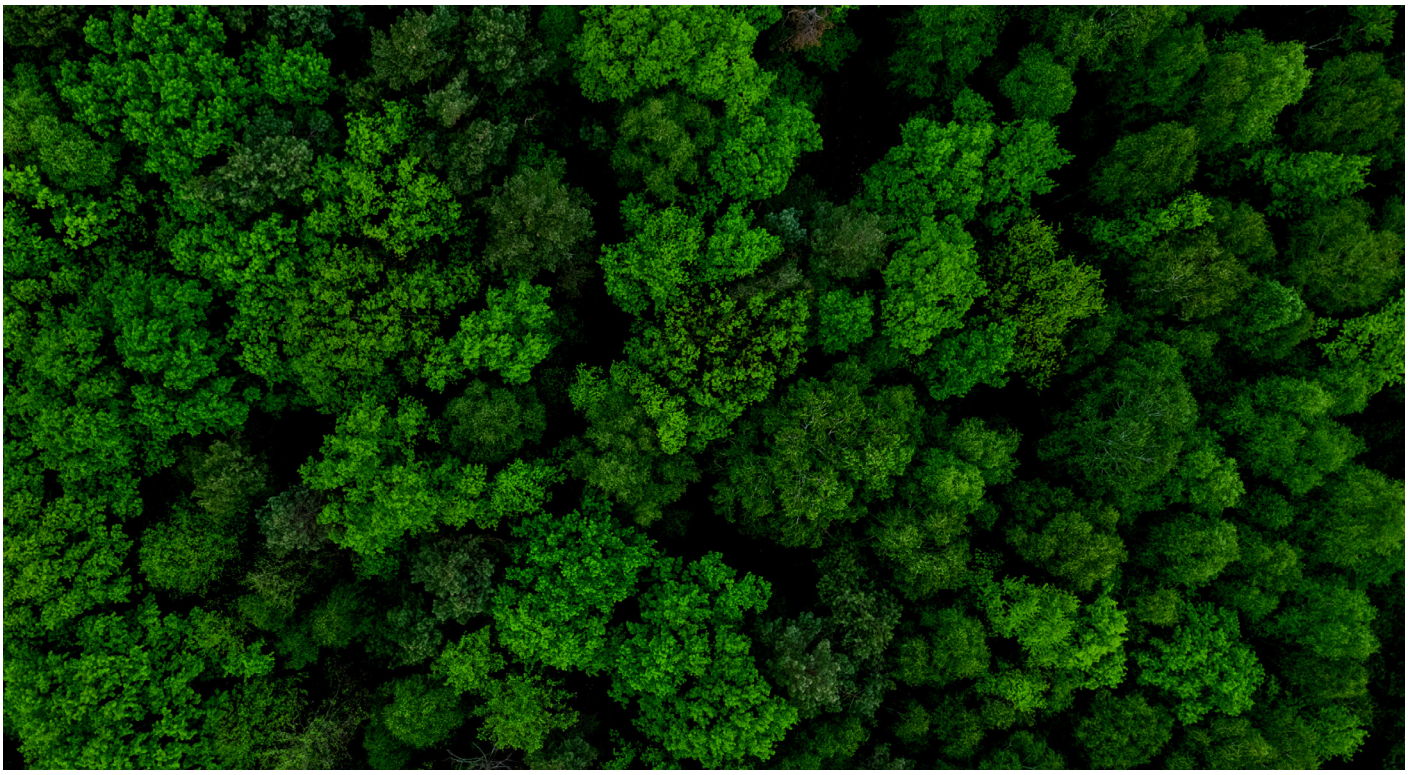

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