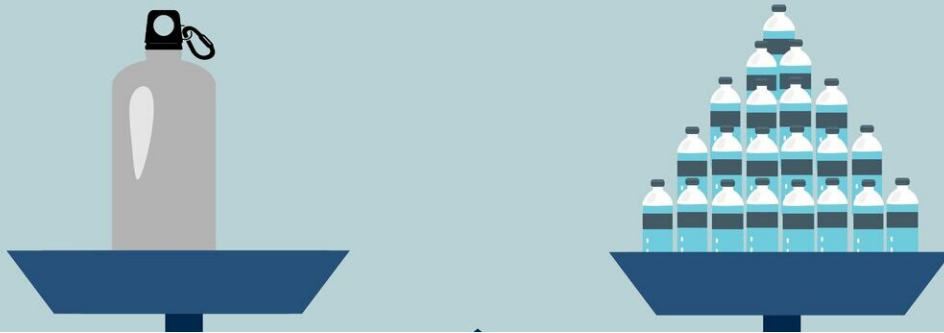


Mythbusting: Five common misperceptions surrounding the environmental impacts of single-use plastics

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5 common misperceptions about the environmental impacts of single-use plastics

Misperception #3: Reusable products are always better than single-use products



Credit: University of Michigan

Stand in the soda pop aisle at the supermarket, surrounded by rows of brightly colored plastic bottles and metal cans, and it's easy to conclude that the main environmental problem here is an overabundance of single-

use containers: If we simply recycled more of them, we'd go a long way toward minimizing impacts.

In reality, most of the environmental impacts of many consumer products, including soft drinks, are tied to the products inside, not the [packaging](#), according to University of Michigan environmental engineer Shelie Miller.

And when it comes to single-use plastics in particular, the production and disposal of packaging often represents only a few percent of a product's lifetime environmental impacts, according to Miller, author of an article scheduled for publication Oct. 26 in the journal *Environmental Science & Technology*.

"Consumers tend to focus on the impact of the packaging, rather than the impact of the product itself," said Miller, an associate professor at the School for Environment and Sustainability and director of the U-M Program in the Environment. "But mindful consumption that reduces the need for products and eliminates wastefulness is far more effective at reducing overall environmental impact than recycling.

"Nevertheless, it is fundamentally easier for consumers to recycle the packaging of a product than to voluntarily reduce their demand for that product, which is likely one reason why recycling efforts are so popular."

The mistaken belief about the central role of plastic packaging is one of five myths that Miller attempts to debunk in her conventional wisdom-shattering paper, "Five misperceptions surrounding the environmental impacts of single-use plastic."

The five common misperceptions, along with Miller's insights about them, are:

- Plastic packaging is the largest contributor to a product's environmental impact. In reality, the product inside the package usually has a much greater environmental impact.
- The environmental impacts of plastics are greater than any other packaging material. Actually, plastic generally has lower overall environmental impacts than single-use glass or metal in most impact categories.
- Reusable products are always better than single-use plastics. Actually, reusable products have lower environmental impacts only when they are reused enough times to offset the materials and energy used to make them.
- Recycling and composting should be the highest priority. Truth be told, the environmental benefits associated with recycling and composting tend to be small when compared with efforts to reduce overall consumption.
- "Zero waste" efforts that eliminate single-use plastics minimize the environmental impacts of an event. In reality, the benefits of diverting waste from the landfill are small. Waste reduction and mindful consumption, including a careful consideration of the types and quantities of products consumed, are far larger factors dictating the environmental impact of an event.

In her review article, Miller challenges beliefs unsupported by current scientific knowledge while urging other environmental scientists and engineers to broaden the conversation—in their own research and in discussions that shape public policy.

"Efforts to reduce the use of single-use plastics and to increase recycling may distract from less visible and often more damaging environmental impacts associated with energy use, manufacturing and [resource extraction](#)," she said. "We need to take a much more holistic view that considers larger environmental issues."

Miller stresses that she is not trying to downplay environmental concerns associated with plastics and plastic waste. But to place the plastic-waste problem in proper context, it's critical to examine the environmental impacts that occur at every stage of a product's lifetime—from the extraction of natural resources and the energy needed to make the item to its ultimate disposal or reuse.

Life-cycle assessment, or LCA, is a tool that researchers like Miller use to quantify lifetime environmental impacts in multiple categories, including climate change and energy use, water and resource depletion, biodiversity loss, solid waste generation, and human and ecological toxicity.

It's easy for consumers to focus on packaging waste because they see boxes, bottles and cans every day, while a wide range of other environmental impacts are largely invisible to them. But LCA analyses systematically evaluate the entire supply chain, measuring impacts that might otherwise be overlooked, Miller said.

Packaged food products, for example, embody largely invisible impacts that can include intensive agricultural production, energy generation, and refrigeration and transportation throughout the supply chain, along with the processing and manufacturing associated with the food and its packaging, she said.

Miller points out that the well-worn adage "reduce, reuse, recycle," commonly known as the 3Rs, was created to provide an easy-to-remember hierarchy of the preferable ways to lessen [environmental impact](#).

Yet most environmental messaging does not emphasize the inherent hierarchy of the 3Rs—the fact that reducing and reusing are listed ahead of recycling. As a result, consumers often over-emphasize the

importance of recycling packaging instead of reducing product consumption to the extent possible and reusing items to extend their lifetime.

"Although the use of single-use plastics has created a number of environmental problems that need to be addressed, there are also numerous upstream consequences of a consumer-oriented society that will not be eliminated, even if [plastic](#) waste is drastically reduced," she said.

"The resource extraction, manufacturing and use phases generally dominate the environmental impacts of most products. So, reduction in materials consumption is always preferable to recycling, since the need for additional production is eliminated."

More information: Five misperceptions surrounding the environmental impacts of single-use plastic, *Environmental Science & Technology* (2020). pubs.acs.org/doi/10.1021/acs.est.0c05295

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