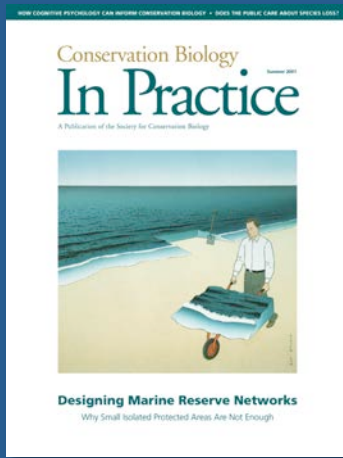


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We Hope You'll Join the Conversation



2001



2004



2008



2010



2012



2013



2014

COVER STORY



By Frances Cairncross

Connecting Flights

Never mind the road map for peace. An unlikely marriage between bird conservation and military aviation is thriving on one of the most divisive pieces of real estate on earth.

IT'S JUST BEFORE EIGHT O'CLOCK in the morning at the end of August, and we have been driving deeper and deeper below sea level for the past 20 minutes. We are in Israel, headed east from Jerusalem toward the Dead Sea, the land growing ever more barren and dusty. As the sky grows lighter, we pass Bedouin shacks and flocks of sheep, their colors ranging from beige to taupe to caramel. Ahead, the cliffs of the Judean Desert begin to emerge in the dawn. In the back of the car, Imad suddenly lets out a whoop—



Yossi Leshem



Frances Cairncross

TV

AS BIRTH CONTROL

By Fred Pearce

Earlier this year Stanford human geographer Martin Lewis asked his students a simple question: How did they think U.S. family sizes compared with those in India? Between Indian and American women, who had the most children? It was, they replied, a no-brainer. Of course Indian women had more—they estimated twice as many. Lewis tried the question out on his academic colleagues. They thought much the same.

But it's not true. Indian women have more kids, it is true, but only marginally so: an average of 2.5 compared to 2.1. Within a generation, Indian women have halved the number of children they bear, and the numbers keep falling.

It's not that the population problem has gone away in India—yet. India has a lot of young women of childbearing age. Even if they have only two or three children each, that will still continue to push up the population, already over a billion, for a

How to defuse the population bomb: Provide people with a steady diet of soap operas and reality TV shows that depict modern, urban lifestyles. New research makes a compelling case that when TV ownership rises, fertility falls.

As a scientist working on breakthrough lighting technologies, Jeff Tsao is a firm believer in the magic of energy efficiency. After all, the numbers are compelling. Replace traditional bulbs with far more efficient light-emitting diodes (LEDs), and, studies suggest, the U.S. could cut the electricity used by lighting by at least one-half. Perform similar efficiency-boosting tricks with cars, buildings, appliances, and industrial processes, and the U.S. could slash greenhouse-gas emissions by at least 23 percent—and save money.

But a few years ago, Tsao, the chief scientist of a lighting research center at the Department of Energy's Sandia National Laboratories in Albuquerque, New Mexico, had a troubling conversation with a leading LED-industry executive. The CEO said that his company isn't in the business to save energy, Tsao recalls. Instead, the executive expected that LEDs would create whole new uses for light, so that people would buy a lot more LEDs than they did regular bulbs—and as a result, consume more energy.

That conversation caused Tsao and his colleagues to begin crunching their own numbers on the relationship between the efficiency of light and the amount of energy it consumes. Using historical data from around the world, they discovered that as the efficiency of light improved—as it did when oil lamps replaced candles, and electric lights replaced oil lamps—the use of energy jumped. "Each time the technology changed, the cost of light dropped dramatically and the consumption of light skyrocketed," Tsao explains.

The spread of super-efficient LEDs, the researchers predicted, would continue that trend. LEDs could create "a massive potential for growth in the consumption of light," they concluded last year in the *Journal of Physics* (1). That's because LEDs are cheaper to operate

BY JOHN CAREY



THE EFFICIENCY CATCH-22

The more energy we save,
the more we use

Struggling to survive in the twenty-first century, naturalists might take a page from their own playbook: evolve, adapt—and use technology to woo people back to nature.

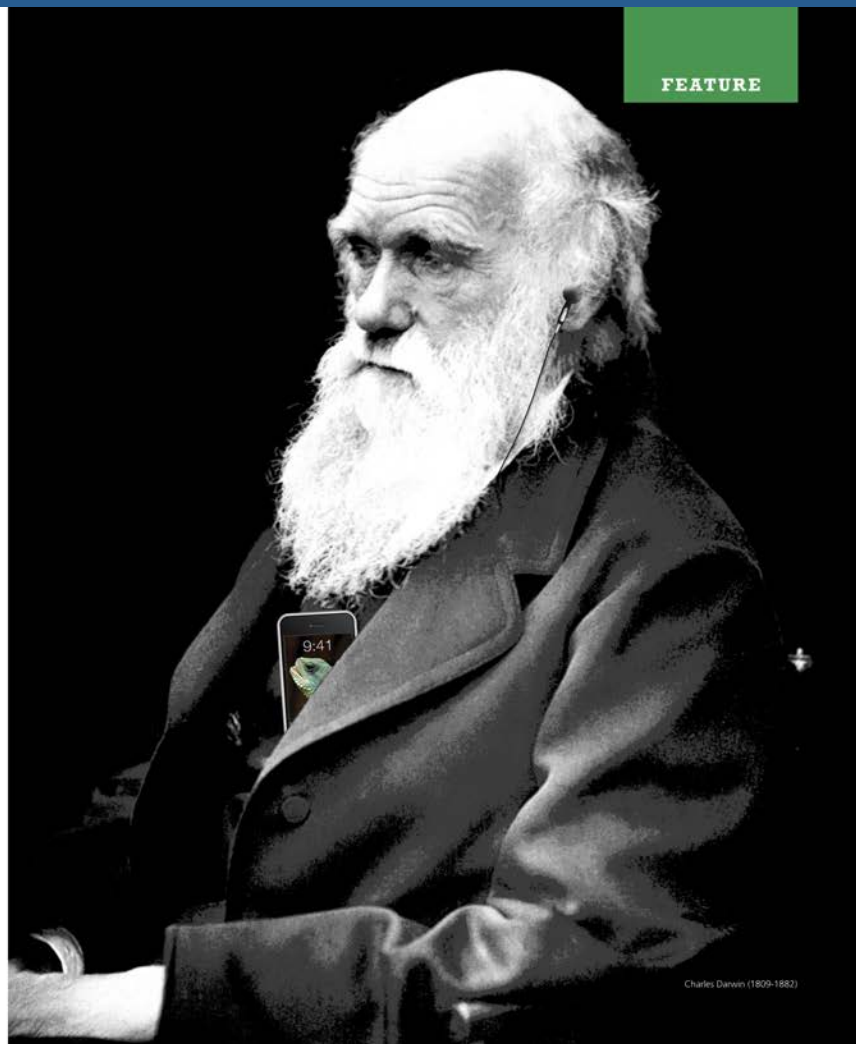
Natural History Upgrade

People who work in the natural world often get asked how on Earth they came to devote their lives to gastropods, or ground beetles, or whatever other species happens to have found its way into their hearts. What the questioners generally mean is that becoming a naturalist is a little enviable, but also odd. As kids, they may have dreamed of becoming Jane Goodall. Then they forgot, setting it aside as a childish thing and becoming plumbers or investment bankers instead.

This would not ordinarily be so terrible. We need plumbers and maybe investment bankers, too. But lately, without realizing it, we also seem to have set aside nature itself.

We like to imagine ourselves as active and outdoorsy. But the reality is that hiking, backpacking, camping, and fishing have all declined sharply over the past 30 years, as have visits to

By Richard Conniff



Charles Darwin (1809-1882)

GENETICALLY MODIFIED CONSERVATION

It sounds like an oxymoron, but genetic engineering is already ushering in a new brand of agriculture that slashes pesticide use and thrives in a warmer, wetter world. **BY ERIK VANCE**

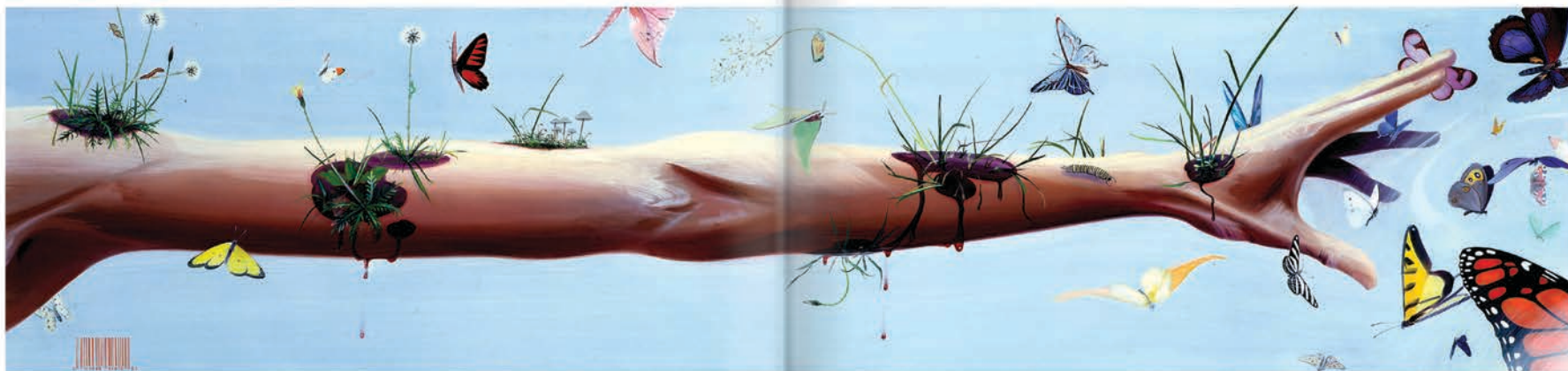


**Green
Revolution
Reloaded**

In the mid-1940s, Norman Borlaug started the Green Revolution on a small farm in southern Mexico. His idea was simple. As the human population skyrocketed, he would grow a new kind of wheat with a thicker stem and bigger seed heads, thus increasing its yield and allowing farmers to grow more wheat—and feed more people—per acre.

The results were staggering. Within two decades, Mexico's wheat harvest had swollen six-fold, thanks to crops descended from Borlaug's original modified wheat. Borlaug then turned his talents toward rice in the Philippines, and high-yield crops spread into almost every major food staple. In all, Borlaug's

Illustration ©Corbis/Bettmann



Some aspects of dirty living can be healthy. A new study posits that the decline of plant and animal diversity in cities may be linked to the recent surge of allergies and other chronic inflammatory diseases.

Letting Biodiversity Get UNDER OUR SKIN

By Rob Dunn

We live at the crossroads of three global megatrends, three barreling and intertwined juggernauts of modernity. The first is the massive migration of humanity to the world's cities. I grew up in a small town, walking deer trails beneath the shade of maples and oaks. Now I live with my kids in a city where the path beneath our feet is ever more likely to be paved. My story is our story. By 2050, two-thirds of all humans on Earth will live in cities.

The second is the loss of biodiversity. Species are disappearing, both from the places where we live and from the earth as a whole. If our hairy ancestors were to visit our cities and suburbs, they would wonder how the escalators work, but they would also question where the plants and animals have gone. What have we done with all the birds? Some, like the Carolina parakeet, are just gone.

Others live on, but at a distance—geographically removed from our daily lives, far away from the majority of people.

And then there's the third trend—the one that, at first glance, seems not to belong with the others. The prevalence of allergies and chronic inflammatory diseases among urban populations in developed countries has skyrocketed in recent years. Incidences of asthma, Crohn's disease, multiple sclerosis, and even depression (which can have an immune component) are on the rise.

The parallels in geography and timing between urbanization, the loss of biodiversity, and the rise in immune-system problems raise an intriguing—and troubling—question. Could our distance from nature and our chronic immunological discontent be related? Some now say . . . yes.



"In Search of Times Past," by Herbert Bayer. © 2014 Artists Rights Society (ARS), New York / VG Bild-Kunst, Bonn

It's a pitch-dark evening in November, and a gaggle of knitters are chatting around a table in the Yarnability knitting shop in Shepherdstown, West Virginia, a historic town 76 miles up the Potomac from Washington, D.C. As the women stitch dishcloths and potholders, an intelligence operation is being hatched in the back rooms of the building. Five tech-savvy environmentalists dial up a video chat to their coder, a member of the Swedish Pirate Party in Gothenburg. The team, which calls itself SkyTruth, is readying its latest surveillance tool for public release in the morning. But the software is not cooperating.

SPIES LIKE US

Armed with low-cost surveillance technologies, nonprofits aided by "citizen spies" are tracking fracking in Pennsylvania, flaring in North Dakota, and rogue fishing around Easter Island

BY W. WAYT GIBBS

A tall, bearded geophysicist peers over the shoulder of a much shorter, bespectacled software entrepreneur at a computer screen. The shorter one is Paul Woods, SkyTruth's chief technology officer. His brow furrows as he scans a report showing upload failures for many of the multigigabyte image files—one-meter-resolution aerial photos of 39 counties in Pennsylvania—that he has been trying to place onto Google's mapping servers. "We're totally hosed with the Google Maps Engine right now," he tells the lanky fellow behind him—John Amos, the founder and president of the nonprofit outfit. "It won't handle any images bigger than 12 gigabytes. So we can't see about 60 percent of the counties."

W

CONSERVATION MAGAZINE
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WE'RE TURNING ENVIRONMENTALISM AROUND

Environmentalism in the twenty-first century is stumbling under the weight of bad news, and people are tuning out. So *Conservation* magazine—UW's new science magazine—is challenging the "doom-and-gloom" environmental narrative with a careful examination of success stories from nature-inspired engineering to ecological health.

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WE'RE TURNING ENVIRONMENTALISM AROUND

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What's the future of environmentalism?

a. {

mass extinction
overpopulation
resource depletion



} b.

smart cities
green technologies
connected landscapes

Join leading thinkers who answer b.

Conservation is a UW science magazine dedicated to changing the conversation about what it means to be "green." It reaches beyond the familiar environmental obituary and features success stories about smart science and technological solutions to the big environmental problems of our time. From underwater robots that spy on whales to the world's first industrial, indoor farm to the connection between allergies and biodiversity, *Conservation* stories peer ahead to a sustainable future.

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THE FUTURE IS **BRIGHT GREEN**

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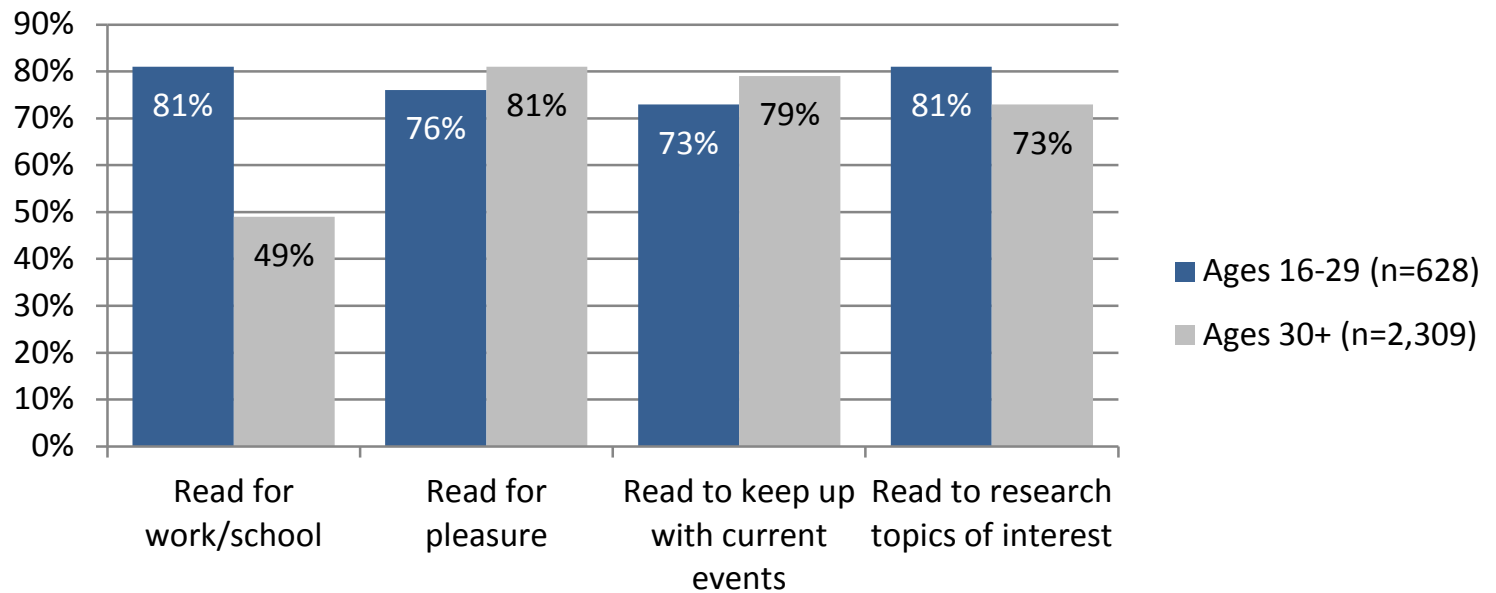
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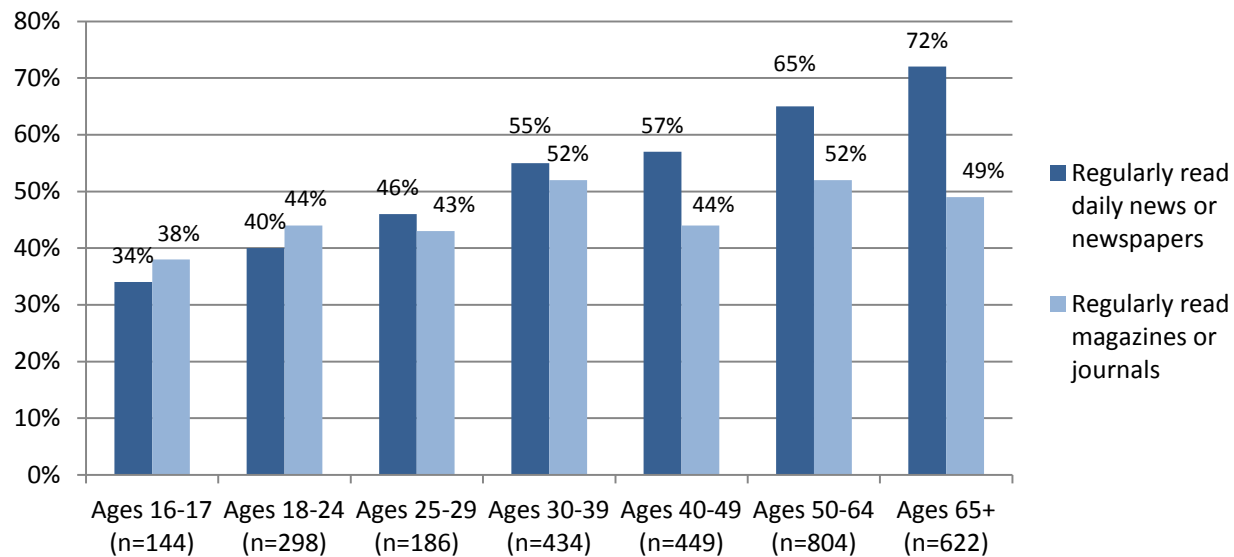
Reasons for reading

% in each age group who read for the following reasons



Portrait of news/newspaper readers and magazine/journal readers

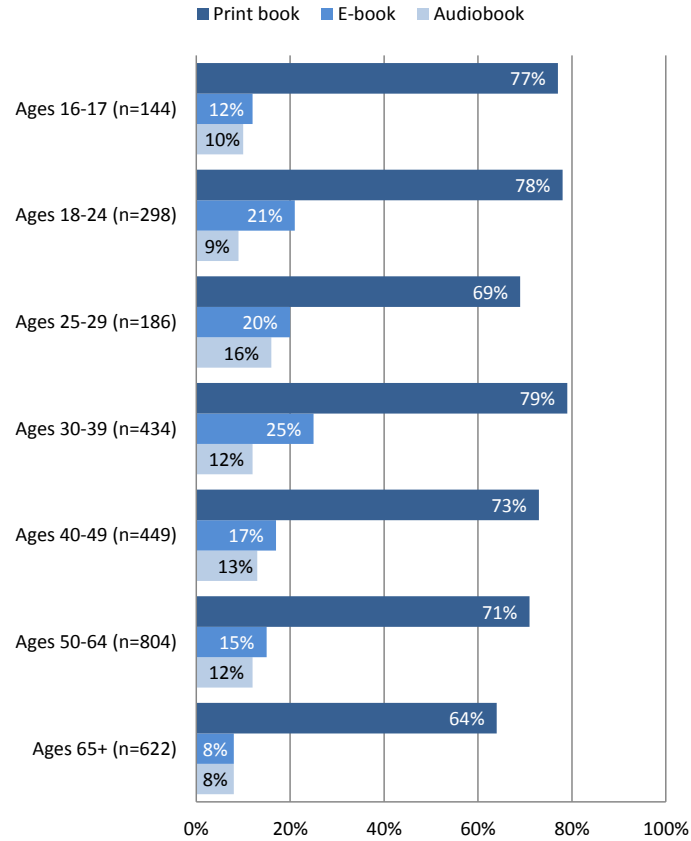
The % of those ages 16+ in each group who regularly read this kind of material



Source: Pew Research Center's Internet & American Life Reading Habits Survey, November 16-December 21, 2011. N=2,986 respondents ages 16 and older. Interviews were conducted in English and Spanish and on landline and cells.

Book formats read in the past year, by age group

% of all Americans in each age group who read a book in each format in the past 12 months. For instance, 77% of Americans ages 16-17 read a print book in the past year.



Source: Pew Research Center's Internet & American Life Reading Habits Survey, November 16-December 21, 2011. N=2,986 respondents ages 16 and older. Interviews were conducted in English and Spanish and on landline and cells.

Conservation

THE SOURCE FOR ENVIRONMENTAL INTELLIGENCE

Weekly Dispatch

April 16, 2014



How thinking about politics alters climate change beliefs

Each of us wears a lot of different hats: employee, parent, friend, member of an ethnic group or political party, and so on. Now researchers have found that when people are reminded of their political identity, their views on global warming can change significantly. The team refers to this condition as "sallience". For instance, "[w]hen... [Read More](#) »



Corals could survive climate change by getting fat

When it comes to climate change, some shall live and some shall die. If we can make educated guesses as to which species will be in the first group and which in the second, we can put more of our conservation efforts where they will be more likely to succeed. That's especially important for corals,... [Read More](#) »



Climate change will alter fire patterns, push caribou herds around

It's not just the heat. Climate change will find (is finding) many creative ways to mess with wildlife and challenge conservationists. One such way is to change the patterns of fires that burn across animal habitats; in many areas, drought and heat have led to increases in fire frequency and severity. New research suggests that these... [Read More](#) »

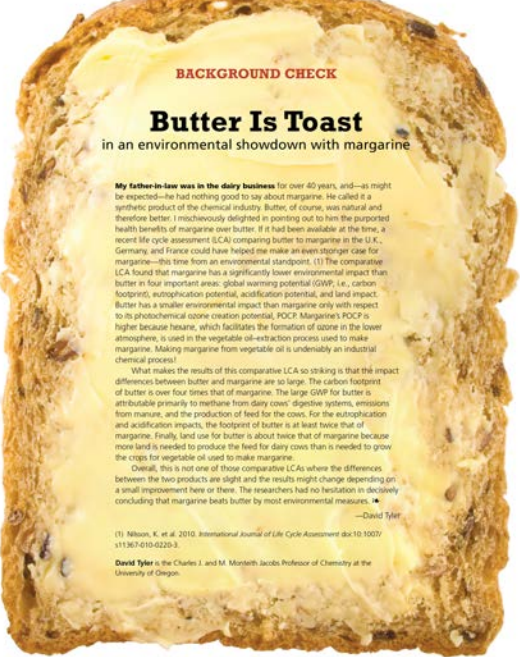


Protecting coastal ecosystems requires global cooperation

More than 1.3 billion people live on our planet's coasts, most of them in developing countries. Put another way, one fifth of our species live within one hundred kilometers of a coastline. Those people, by and large, depend on coastal seas not just for food, but also for their livelihoods. And, as we all know,... [Read More](#) »

BACKGROUND CHECK

Lifecycle analysis of everyday objects



BACKGROUND CHECK

Butter Is Toast

in an environmental showdown with margarine

My father-in-law was in the dairy business for over 40 years, and—as might be expected—he had nothing good to say about margarine. He called it a synthetic product of the chemical industry. Butter, of course, was natural and therefore better. I mischievously delighted in pointing out to him the purported health benefits of margarine over butter. If it had been available at the time, a recent life cycle assessment (LCA) comparing butter to margarine in the U.K., Germany, and France could have helped me make an even stronger case for margarine—this time from an environmental standpoint. (1) The comparative LCA found that margarine has a significantly lower environmental impact than butter in four important areas: global warming potential (GWP), i.e., carbon footprint, eutrophication potential, acidification potential, and land impact. Butter has a smaller environmental impact than margarine only with respect to its photochemical ozone creation potential, POCP. Margarine's POCP is higher because heptane, which facilitates the formation of ozone in the lower atmosphere, is used in the vegetable oil-extraction process used to make margarine. Making margarine from vegetable oil is undeniably an industrial chemical process.

What makes the results of this comparative LCA so striking is that this impact difference between butter and margarine are so large. The carbon footprint of butter is over four times that of margarine. The large GWP for butter is attributable primarily to methane from dairy cows' digestive systems, emissions from manure, and the production of feed for the cows. For the eutrophication and acidification impacts, the footprint of butter is at least twice that of margarine. Finally, land use for butter is about twice that of margarine because more land is needed to produce the feed for dairy cows than is needed to grow the crops for vegetable oil used to make margarine.

Overall, this is not one of those comparative LCAs where the differences between the two products are slight and the results might change depending on a small improvement here or there. The researchers had no hesitation in decisively concluding that margarine beats butter by most environmental measures. ■

—David Tyler

(1) Nilsson, K. et al. 2010. *International Journal of Life Cycle Assessment* doi:10.1007/s11367-010-0229-3.

David Tyler is the Charles J. and M. Monteth Jacobs Professor of Chemistry at the University of Oregon.



BACKGROUND CHECK

The Footprint of Restroom Hand Dryers

1. PUSH BUTTON
2. RUB HANDS GENTLY UNDER WARM AIR
3. WIPE HANDS ON PANTS

Who hasn't seen the instructions for heated-air hand dryers in public restrooms deflated with this practical advice? These types of hand dryers seem to be universally lauded, but that's too bad: a recently published comparative life cycle assessment (LCA) of this and other hand-drying methods revealed that modern, high-speed blow dryers are actually our most sustainable hand-drying choice in a public restroom, at least with respect to global warming potential (GWP). (1)

Where does GWP enter into hand drying? For electric blow dryers, generating the electricity required for operation is the major source of greenhouse gas emissions. For a cotton roll towel system, the energy associated with laundering the towels is a major contributor. For paper towels, the manufacturing phase has the biggest carbon footprint.

What makes this LCA study so interesting is that the authors did a thorough job of investigating how their sustainability rankings for hand-drying methods might change depending on how they are used. For example, the authors asked how the LCA results would differ if electric dryer

running time varied. Longer times use more electricity, which increases GWP, and shorter times use less electricity, which lowers GWP. After looking at a range of scenarios, the researchers concluded with a high degree of confidence that high-speed blow dryers have a lower GWP impact than paper towels and cotton roll towels. They further concluded that no environmental distinction (based on GWP) can be made between paper towels, cotton roll towels, and traditional low-speed, heated-air blow dryers.

Rent assured there is no need to use your pants? It's okay to leave your hands in the high-speed blow dryer a little bit longer. ■

—David Tyler

(1) Gregory, J.L., T.M. Monteth and R.E. Echan, 2013. *International Journal of Life Cycle Assessment* doi:10.1007/s11367-013-0606-0.

David Tyler is the Charles J. and M. Monteth Jacobs Professor of Chemistry at the University of Oregon.

AN EXPLORATION OF EVERYDAY STUFF

BACKGROUND CHECK

How Green Is Grocery Delivery?

Younger readers might be astonished to learn that until just 40 or 50 years ago, milk, cheese, and even ice cream were customarily delivered to your doorstep by the local dairy. The "milkmen" of years past is now largely extinct, but in his place we are starting to see more and more grocery stores offering home delivery of items purchased online.

There's even a nascent resurgence in home delivery of dairy products and fresh produce by local farms. Are these emerging delivery services more environmentally friendly than personal car trips to the store or farm?

A recent study in *Journal of the Transportation Research Forum* calculated greenhouse gas emissions for grocery delivery in the Seattle area. (1) The researchers found that the distance traveled by a delivery vehicle is shorter than the sum of the distances traveled by customers' cars. In fact, with smart planning of the delivery route, it could be a whopping 85 to 95 percent less. Even though delivery trucks generally produce more carbon dioxide emissions per mile than cars, the increased emissions per mile are more than offset by the decreased number of miles traveled by the delivery trucks. Consequently, when personal car trips to the store or farm

replaced by a delivery service, carbon dioxide emissions also decrease substantially.

For maximum environmental benefit, the researchers found, delivery vehicles should group their deliveries by geographical area. In contrast, random delivery routes based on customers' selection of date and time for delivery were considerably less efficient—although still much better than personal car travel.

In other words, for the greatest reduction in greenhouse gas emissions, customers would have to adapt to a system in which the provider mandates service times for a particular region—much like municipal garbage collection services do now.

Surprisingly, the environmental benefits of a delivery service were seen not only in high population density areas but also in rural areas, where people are more spread out. Moreover, fewer personal car trips to the grocery store mean less road congestion, an improvement in the quality of life for all of us.

—David Tyler

(1) Wyzank, E. and A. Goodchild, 2012. *Journal of the Transportation Research Forum* 51(2): 111-126.

David Tyler is the Charles J. and M. Monteth Jacobs Professor of Chemistry at the University of Oregon.



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Introducing a new partnership with Duke University's School of the Environment



The Artful Planet

A new online series by Bill Chameides
connecting the arts & the sciences

October 22, 2013

Are Artists the Ultimate Environmentalists?

Some say there is a collective unconscious; a cache hidden deep within all of us that contains all human experience from the time our forebears first stood erect to view the world as sentient beings to this very moment. An infinite treasure of memories, if we could find the key to unlock them ... [Read More](#) ▶

Conservation

Classroom Resources

Find more conservation classroom resources at conservationmagazine.org.

Fall 2012 (Vol 13 No 3)

“ Even though both instinct and reason have their say, instinct and emotions have the decided edge. ”



The EcoPerception Gap

By David Ropeik

Why do we worry too much about some environmental risks and not enough about others?

SUMMARY QUESTIONS

[worksheet available online](#)

1. What does the author mean by the “perception gap”? (answer: In short, it is the disconnect between a person’s assessment of risk/danger of an activity and the actual risk/danger of that activity.)
2. Explain the neurobiology behind this statement: “Our brains are hardwired to feel first and think second.” (answer: External stimuli reach the amygdala of the brain first, which, if it senses danger, sends out signals for a “fight or flight” response. After the amygdala, the stimulus reaches the cortex, which is responsible for higher-order thinking, processing the details of the stimulus, and deciding on the reaction. The cortex process takes about 20 milliseconds in humans, during which the “fight or flight” response is already underway.)
3. What are the three ways that information gets processed in an emotional way rather than logical way? (answer: 1. Loss aversion = we are more sensitive to, and more troubled by, loss than we are pleased by equivalent gain. 2. Representative effect = how information fits into patterns of what we already know or believe. 3. Framing = the way information ‘feels’ to us is influenced by the context and meaning in which it is initially presented.)

What’s Inside:

Summary Questions
Discussion Questions
Advanced Activities
Build Your Own Glossary



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Conservation

Classroom Resources

sentative effect = how information fits into patterns of what we already know or believe. 3. Framing = the way information ‘feels’ to us is influenced by the context and meaning in which it is initially presented.)

4. Give three examples of risk-perception factors and how they relate to a specific conservation issue.

DISCUSSION QUESTIONS

[worksheet available online](#)

1. What makes the perception gap different from hypocrisy or lack of knowledge? The author lists three examples from his friends at the beginning of the article. Can you come up with a perception gap in yourself or an acquaintance? What factors have led you to process information related to this issue in an emotional way rather than logical?
2. What is your reaction to the examples of loss aversion? Which is the more emotionally poignant slogan to you: “Stop the loss of the Amazonian rainforest,” or “Save the Amazonian rainforest”? Look around for other examples used in marketing.
3. How important is it to understand concepts in psychological risk assessment, such as loss aversion, representative effect, and information framing, when working in conservation science? Is it important enough for scientists to receive training in?
4. The author lists his friends’ fears (mercury, nuclear power, and chemicals) as being particularly “scary,” while climate change, particulate air pollution, and ocean acidification are perceived as less scary. Do you agree? Is your reaction logical or based in emotion? List 10 more environmental issues, and then rank them in terms of scariness. Pass your un-ranked list to someone else for them to rank. Does your ranking agree with other group members? Discuss your ranking and possible reasons for differences between individuals.
5. Choose an environmental issue that you think does not receive enough attention or response from public attitude or policy. Evaluate how this issue falls into the categories of risk-perception factors given in the article. Pick one or two perception factors that you think could be influenced, and describe how a campaign/discussion/information could be used to influence that risk perception factor.
6. What is your reaction to the four categories of people’s cultural cognition (hierarchists, egalitarians, individualists, and communitarians)? What do you

BUILD YOUR OWN GLOSSARY

- ▶ [heuristics/biases](#)
- ▶ [loss aversion](#)
- ▶ [representative effect](#)
- ▶ [framing an opinion](#)
- ▶ [cultural cognition/ outlook](#)



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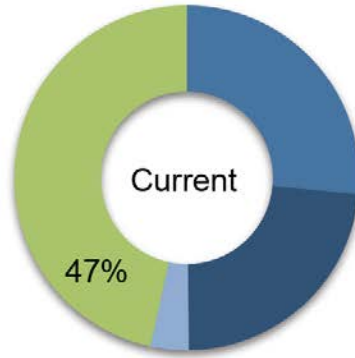
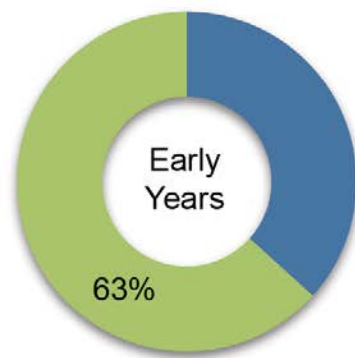
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**ENVIRONMENTAL
MEDIALAB** Creative Ideas for
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- syndication
- group funded beats