

Can Behavioral Economics Help Save Coral Reefs and Fisheries?



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[\(6\)](#)
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It's not that people don't care about the environment; it's that more pressing needs like feeding their families and paying their bills trump environmental concerns. As a marine biologist, I worry about how poverty can hinder the sustainability of fishing, and therefore endanger the future of fishing communities. The "teach a man to fish" adage can only hold true if there are fish left to catch.

The big question: How we can enable people to take a longer-term view, to fish today but save some for later?

To start to answer that question, I drove around Curaçao and Bonaire for a few months with folding chairs and a cooler full of beverages and snacks in my trunk, and interviewed as many fishers and SCUBA instructors as I could. (Enormous thanks to Faisal Dilrosun (Curaçao Fisheries Division), Ramon de Leon (Bonaire Marine Park), and wonderful translators Kurt Brown, Jerry Vollebregt, Mark Brown, and Dustin Abraham who made this project possible.)



In the interviews, I asked people about their preferences for how fishing and diving should be managed, their support for conservation measures, and their finances. Then, I conducted an experiment to measure their time preferences (i.e., financial patience). 350 interviews later, I had some answers and some ideas.

After detailed analysis of the interview responses in collaboration with economist (and my co-author) [Dan Saunders](#), here's what we found (recently published in [Ecological Economics](#) as "[Time Preferences and the Management of Coral Reef Fisheries](#)" (open access article)): Both fishers and divers were somewhat financially impatient, though fishers more so, perhaps due to their low incomes.

1. *Both fishers and divers were somewhat financially impatient*, though fishers more so, perhaps due to their low incomes.
2. *People who were less patient with money (e.g., preferred \$20 tomorrow over \$50 in two weeks) were also less supportive of marine reserves*. In other words, there is a relationship between the willingness to wait for a check and the willingness to wait for fish populations to recover, spill over and leave the reserve, and thereby improve catches.
3. *Conservation seems to have inertia*. There was much greater support for conservation measures on Bonaire, which has had a marine park for decades, with great tourism benefits. I coined the term "*conservation inertia*" to capture the idea that after a community sees the financial benefits of one successful conservation initiative, people are more likely to support similar programs in the future. Around 20 years ago in [Barbuda](#), where I am currently leading the [Blue Halo Initiative](#), the community closed their lagoon to fishing and after a year saw an incredible increase in the number of lobster. That positive experience seems to have made people open to the idea of establishing additional marine reserves, because they have seen one work and benefited from it.



4. *Ownership may not be enough to ensure stewardship*. Establishing property rights over an area or fishery is becoming more and more common (called [catch shares](#), territorial use rights for fisheries (TURFs), or [individual transferable quotas](#) (ITQs)). However, when people are financially constrained, and focusing on the future feels like an impossible luxury, the odds are stacked against sustainable use.

5. *Some people use the price of beer as a financial reference point.* In order to determine interviewees' discount rates I asked questions about tradeoffs between less money now and more money later. When the amount of the now option was below the cost of a case of beer (i.e., \$35 now), there was a spike in fishers' willingness to wait in order to get a larger sum of money (i.e., \$50 later), with a few fishers actually stating this as their rationale.

So, what does this mean for how to improve ocean management?:

1. *Get it right the first time:* Try really hard to get the first sustainability initiative in a place right, so that conservation inertia can set off a cascade of new management measures being implemented with community support.
2. *Property rights are only part of the solution:* In order to prevent overfishing, property rights should be paired with additional management measures (e.g., restrictions on fishing gear that damages the environment), strong enforcement, and robust community buy-in.
3. *Bridge the gap:* Consider ways to offset the near-term costs to fishers of putting new conservation measures in place. For example, the dive industry, using its better access to credit, could pay fishers to retire damaging gear and reap the benefits of a healthier ecosystem.

In sum, *it is critical to find a way to align short-term needs with long-term benefits so that people can use the ocean without using it up.* Considering how economics and human behavior interact with ecological factors can lead to better strategies for managing the ocean sustainably.

So, yes, behavioral economics just might help save coral reefs and fisheries.



p.s. This research was covered in The Atlantic as "[How the Famous Marshmallow Study Explains Environmental Conservation — A marine biologist discovers the importance of behavioral economics.](#)"

Note: If you want to read the full paper, it's open access and available [here](#), and the official jargon-loaded abstract is below:

To investigate a potential relationship between financial and marine resource use decisions, we conducted a time preference experiment with 153 fishers and 197 SCUBA divers on Curaçao and Bonaire. The experiment was part of a socioeconomic survey wherein interviewees were asked about their fishing and diving practices, views on fish population and coral reef health, and preferred marine resource management approaches. We use a $\beta\delta$ -model to identify discounting and present bias. Divers had a mean individual discount factor (IDF) of 0.91, significantly higher than fishers' mean of 0.82. Fishers and divers had similar distributions of IDFs and present bias; overall 66% of interviewees were non-biased, 22% future-biased, and 12% present-biased. IDFs and present bias were able to predict management preferences after controlling for demographic factors. However, the effect of discount factors is unique to divers, and the effect of present bias is concentrated among fishers on Curaçao. Differences in time preferences between fishers and divers should be considered when developing management strategies. Transfer payments from the dive industry could facilitate a transition to sustainable fishing practices. Establishing property rights alone may not be sufficient for ensuring sustainability if fishers are present-biased and greatly discount the future.