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Ask a Scientist: If the polar ice caps grew last year, what does that mean for global warming?

Abby Barnes, Ph.D. Student in Biological Psychology Apr 24, 2018



Courtesy of The University of Tennessee, Knoxville.

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The polar ice caps grew last year. This is a true statement, but does it say what you think it says?

Sometimes true statements can lead to false conclusions. Given that, we here at Ask a Scientist want to take a moment to talk about truth.

People think of truth as something absolute. Maybe we don't always know what the truth *is*, but we know it *exists*, right? Every conceivable argument has one conclusion that is true. That's a fact.

Or is it? The problem with believing in truth is that it depends on the belief that there is a world existing outside of our perception that is not altered by our perception. But is this really true? Science struggles with this constantly. Our perceptions shape everything around us — not just what we believe but how we behave. How we behave shapes the experiences we have and the behaviors of things around us. The world is, in fact, a constant interaction of perceptions. It is impossible to separate perception from reality.

This is both science's biggest strength and greatest weakness. It's a strength because we recognize it and we try to address it — giving us a degree of credibility in our own minds, at least. It's a weakness because since we try to address it, we often end up pretending it doesn't affect us — but it most certainly does.

If the ice caps grew last year, what does that mean for global warming? We think this part of the question illustrates how perceptions can change meaning. Hearing the statement, "The polar ice caps grew last year," might make you think that the polar ice caps got bigger than the year before. That would make a lot of the global warming evidence seem pretty weak or maybe even totally false.

But did the statement *actually* say the ice caps got bigger last year than the year before? No. The statement — either intentionally or unintentionally — misleads readers by playing off our assumptions. We generally assume that if someone says, "Last year we saw increases," it means that something ended up bigger at the end of the year than at the end of the previous year. We hear this kind of phrasing a lot because end-of-the-year reports generally talk about overall performance compared to previous years.

But just because something is *generally* true doesn't mean it applies in all cases. We shouldn't assume that our current experience is following the patterns of our previous experiences.

That's where perception comes into play. Your brain is lazy. Well, okay, not really. It's doing *a lot* of different things every second of every day, so maybe lazy isn't the right word. Maybe it's more overwhelmed. It doesn't have the time or capacity to sit and analyze every situation as if it were the first experience it's ever had. That would be very, very dangerous. You need to be able to recognize a bear as a bear, a gun as a gun, a friend as a friend and a foe as a foe. You need to be able to do this really fast so you can make life-saving decisions.

So to speed things up, your brain makes a lot of assumptions about your current situation based on your past experiences. But your brain doesn't tell you, "Hey, I've just assumed x, y and z! Maybe you should check on that stuff later." Nope. Your brain is super convinced that it's made the right judgment, meaning *you're* super convinced that what you *perceive* is *true*.

For example, if you've been viciously attacked by a dog, chances are all dogs are going to be really scary to you — even if most dogs are really nice. That's how our experiences shape our perception and how our perception shapes our realities. How does this all relate to the question of ice caps growing last year? Let's answer that question with another question. Is it possible that the polar ice caps grow *and* shrink?

The answer is yes. The polar ice caps grow every year because just like the rest of the world, the poles experience seasons. The ice retreats in the summer and then "grows back" in the winter. This doesn't really mean anything for global warming, except if you take into consideration *how much the ice caps grew last year compared to the year before*. When you do that, you see that the ice caps have been "growing" less and less each winter for many years. That's one line of evidence for global warming. It's also why you can truly say, "The polar ice caps grew last year," but why global warming may be still a very real problem.

We'll be honest: You're going to hear a lot of statements in your life that play the same game. We all end up perceiving and assuming inaccurate information. It's totally inevitable, but we'd like everyone — including ourselves — to at least try and resist the "truth." Look at what assumptions led to that truth and doubt every single one of them.

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