

# Research News

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## The big benefits of being a little fish

BY SEAN MOORE  
Research Promotion

"Why is any fish small?" asked Mark Abrahams, a zoologist and associate dean (research) in the Faculty of Science.

"It doesn't make a lot of sense. There are fewer food items for you to consume and all sorts of predators to deal with. There's got to be an upside. So that's what we're looking at in my lab: what's the upside in being small?"

Funded by the Natural Sciences and Engineering Research Council of Canada (NSERC) and Manitoba Hydro, his research into predator-prey relationships in various aquatic scenarios will aid conservation efforts, like those focused on revitalizing Lake Sturgeon population.

Small fish contend with some physiological factors that dim their survival hopes: they readily fit inside many mouths, they can't swim as well as bigger fish, and they have less bodily space to invest in predator-sensing organs, like eyes.

But like soap operas of the terrestrial world, the underwater drama supplied by fathead minnows and yellow perch – Abrahams' main experimental subjects – is one with counterintuitive plot lines playing out in unusual settings.

To learn more about the players, Abrahams built a contraption made of three interconnected plastic barrels with sensors that record each fish's comings and goings. One barrel was a hypoxic



Photo by Sean Moore

Mark Abrahams, zoology, is associate dean (research) in the Faculty of Science.

environment (having low oxygen levels), and the other two were normoxic (having normal oxygen levels).

In marshes, like the one at the Delta Marsh Field Station, dissolved oxygen levels are often dangerously low. But given the choice, what environment would fish choose?

In his experiments, contrary to what fish physiology literature suggests, prey preferentially chose hypoxic environments while predators didn't. Indeed, Abrahams observed

adult yellow perch becoming dysfunctional in hypoxic water in about 15 minutes.

"They just didn't look happy," he said. "They looked like someone who's been to a party and had too much to drink. Eventually they began to roll onto their sides. But the fathead minnows could care less. They don't really get affected at all."

Later experiments led Abrahams to conclude that both body size and species type determine a fish's ability

to tolerate hypoxia. Smallness, it turns out, allows for refuge in areas once considered valueless.

"Some of the critical environments may not be the ones you think are critical to sustaining your fish populations," Abrahams said. "We seem to have a certain bias on what makes a nice fish habitat. I think this shows that is a very dangerous assumption to make."

Abrahams' lab was also surprised by another environment the little fish chose: turbid, rather than clear water. (It's odd to spend much energy producing good eyes only to flee to low visibility areas.) A graduate student is presently mapping out detection probabilities for both predator and prey in turbid water to learn more about this.

So how does this work benefit Lake Sturgeon, an ancient fish with threatened existence despite having tremendous fecundity? Well, a brood consists of thousands of fish each varying in size and each capable of living upwards of 90 years. The smaller offspring were long considered the runts, but Abrahams now reckons it may be a parental strategy to ensure good diversification. After all, ecosystems can change a lot in 90 years and a petite physique could end up being the best asset.

Armed with such knowledge, conservationists can now better select what fish will succeed in certain environments allowing the aquatic soap opera another season to play out.

## Understanding our everyday interactions

BY FRANK NOLAN  
Research Promotion

From time to time, we all worry about how we are perceived by others, but in some situations, this concern can cause the very problems we're trying to avoid.

Jacquie Vorauer, psychology, is studying how this phenomenon affects interactions between people from different social and cultural groups. In 2006, her project received \$123,000 in new funding from the Social Sciences and Humanities Research Council of Canada (SSHRC).

"I have looked at this mostly in terms of ethnic groups. Interaction between Canadians of European descent and First Nations Canadians is something I've studied quite a bit because of its relevance in the local context," she said.

Vorauer has found that interacting with somebody from another group can heighten our concerns about evaluation, leading to uncertainty about how we're coming across, and

changing the way we behave.

"We're looking at how everyday interactions unfold between basically well-meaning people," she said. "In some cases, fear of doing the wrong thing and offending the other person can lead to more awkward and distant behaviour, which is not picked up in the most positive way."

Vorauer is exploring the things that can trigger this "de-railing" of inter-group interactions, including the approaches people use to try to empathize more with members of other groups. In some cases, she said, teaching people to take a more sympathetic view of members of other groups can lead to more positive attitudes, but it doesn't always help in real-world interactions. She added that most studies have looked at attitudes and stereotypes rather than what actually happens when members of different groups get together.

"If you're looking at the situation from the dominant group perspective, you may imagine that your advantaged position seems unfair to the other

person and you might be thinking about who is to blame for the social and economic difficulties that have been experienced by the other group," she said. "And if you look at it from a minority group perspective, you might be thinking about what kind of stereotypes the other person has about your group, and so on. All of these things can lead people to feel more concerned about evaluation, and they may behave less positively."

Other triggers that Vorauer is studying include social messages that encourage treating everybody the same, versus those that advocate appreciating differences between groups. She is also examining the specifics of individual interactions, right down to things like the subject of a particular conversation.

While her research is ongoing, Vorauer said there are some strategies that appear to be more successful than others.

"What seems to be most helpful is simply focusing on the other person, rather than yourself. Trying



Submitted Photo

Jacquie Vorauer, psychology, is studying interactions between people from different social and cultural groups.

to learn more about them and letting go of some of your own worries and inhibitions could very well be the best approach."

## Bringing Research To Life

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