asked about research to be done on the station, she replied, "we're not even sure what questions we will be answering in terrestrial laboratories." But, in reference to the space station she says, "I think we're going to have a dynamite research program." This paradox reminds me of the story of the airline captain who announces bad news–good news: "We are lost, but we are making very good time," to which he adds reassuringly "and I am sure we are going somewhere!"

The space station was repeatedly rescued from termination by the assertion that it was an important facility for fundamental biomedical research, that is, other than crew adaptation factors. Contrary to Swain's comments, we do have a good, if general, idea of the research that will be going on in terrestrial laboratories in the future. We have 5-year research grants and longer-term support of centers of excellence. It's time to share the general nature of the space station research program, if there is one, with the public and the scientific community. Or will we have a facility looking for a program?

Scott N. Swisher*
1290 Wittier Drive, East Lansing, MI 48823, USA
*Emeritus professor of medicine, Michigan State University

Examining the Motivations for Generosity

In their report "Cooperation through image scoring in humans" (5 May, p. 850), Wedekind and Milinski describe an image-scoring game they conducted to test the process of indirect reciprocity (*1*). However, their experiment contains a confounding factor that may better account for the obtained findings.

Eight groups of participants played six rounds of a game in which they could repeatedly give and receive money. Each player was required to play once per round as "donor" and twice per round as "receiver," but players had no way of knowing who had helped them in previous rounds. Care was also taken so that players would never interact with each other in a directly reciprocal role. Players were provided with the receiver's history of giving or nongiving at each round, and the results showed that donations were more frequent to receivers who had been generous to others in earlier interactions. However, this observed correlation could have resulted from the effects of a third unmeasured factor, the tendency to give to those most in need (*2*). All things being equal, players who had given more in previous rounds had earned less in the game. Players may have been motivated to make donations to coplayers with a generous giving history out of a concern about their running balance of money, and therefore were acting on a perceived need, rather than reciprocity. Theoretical models (*3*) show that helping occurs when others are perceived to be in need (social responsibility) regardless of the recipient's worthiness and without an expectation of being rewarded (*4*).

Thus, Wedekind and Milinski's experiment does not clearly demonstrate indirect reciprocity. Their game confounds a player's generosity with the likelihood that they appear in relative need of a donation.

Nikolaos Kazantzis
Robbie Sutton
School of Psychology at Albany, Massey University, Private Bag 102904, NSMC, Auckland, New Zealand. E-mail: n.kazantzis@massey.ac.nz

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Finding the Missing

Response

The models on indirect reciprocity (*1*) predict that generosity increases the donor's image score and thereby his or her chances of being treated generously by others in the future. These are the proposed long-term benefits of generosity, but there are obvious short-term costs, because by being generous one gives something away. Therefore, as Kazantzis and Sutton point out, in a relatively short game like we set up as described in our report, a player's image score is likely to be confounded with his or her account, that is, with the relative need of a donation.

Indeed, there seemed to be a negative correlation between the players' accounts and their image scores, but this correlation was statistically not significant. We reanalyzed our data in the light of Kazantzis and Sutton's hypothesis using the receivers' accounts instead of their image scores as the dependent variable in our main analysis, the repeated measures analysis of variance (ANOVA) that was explained in Fig. 2 of our report. The statistics results were analogous but apparently of weaker significances. Giving or not giving would correspond to the receiver's account ($F = 4.08$, $P = 0.05$) as it did to the receiver's image score ($F = 8.20$, $P = 0.006$), whereas the effect of the group ($F = 0.46$, $P = 0.86$) and the interaction ($F = 1.68$, $P = 0.13$) were again both not significant. However, in half of the groups (groups 2, 3, 6, and 7), we had not only displayed the receivers' previous decisions as donors, but also their current accounts. The effect of this experimental treatment (that is, of displaying the account or not) was not significant when included in a nested repeated measures ANOVA, with the receiver's image score as the dependent variable and with groups nested in treatment (effect of displaying the account: $F = 0.07$, $P = 0.79$). We conclude that our data are in agreement with the predictions from indirect reciprocity models, and our experimental treatment provides no support for Kazantzis and Sutton's alternative hypothesis.

Claus Wedekind
Institute of Cell, Animal and Population Biology, University of Edinburgh, West Mains Road, Edinburgh EH9 3JT, Scotland, UK. E-mail: claus.wedekind@ed.ac.uk

Manfred Milinski
Max-Planck-Institute for Limnology, Department of Evolutionary Ecology, August-Thienemann-Strasse 2, D-24306 Ploen, Germany. E-mail: milinski@mpil-ploen.mpg.de

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What Story Is Told by Oceanic Tracer Concentrations?

In their report "Temporal trends in deep ocean Redfield ratios" (4 Feb., p. 831), Pahlow and Riebesell suggest that the marine biota has changed in the last few decades in response to human activities. These findings challenge the steady-state paradigm of ocean biogeochemistry and might have important implications for the global carbon cycle. However, the signals that Pahlow and Riebesell analyzed are subject to numerous methodological uncertainties [discussed elsewhere (*1*)], and their interpretation of the signals hinges critically on the exclusion of alternative explanations. Here we propose alternative explanations for the reported trends consistent with existing data and knowledge.

For North Atlantic deep waters, Pahlow and Riebesell report an increase in nitrate to phosphate (N:P) ratios and suggest increased nitrogen deposition as a cause. However, this mechanism would decrease the ratio of apparent oxygen utilization (AOU) to nitrate, because this mechanism should lead to an increase in nitrate without changing oxygen. This effect is not seen in Pahlow and Riebesell's analysis. A small