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Hope for Bohemian ecologists – comments on “A possible role of social activity to explain differences in publication output among ecologists?” by Tomáš Grim, *Oikos* 2008

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Like many ecologists we were intrigued by Tomáš Grim's original and thought-provoking evaluation of professional achievement amongst his Bohemian ecologist colleagues in your sister journal, *Oikos* (Grim 2008). In his paper, Grim argues and infers from a correlational analysis that publication success is negatively affected by beer drinking – an assumed correlate of 'social activity' – due to negative effects of alcohol on cognitive performance. Here we question Grim's conclusions. We criticize his focus on a single hypothesis, without consideration of reasonable alternatives, and note that his approach provides a valuable illustration of a more general flaw in ecological inference.

Grim correlated publication success of Czech ecologists to their self-reported beer consumption. We note shortfalls in this approach. We could, for example, quibble with Grim's measures of publication success (Lortie et al. 2007), note the problems of using self-reported drinking as a measure of true alcohol consumption (Nevitt and Lundak 2005), question his neglect of gender differences (Bailey et

al. 1991) and debate whether heavier drinkers really are involved in more social or anti-social behaviour (Ogle and Miller 2004). We might also note the paper focuses on just 10% of the variation in publication success – that part not explained by each ecologist's age and duration of publication career. However, this would be nit-picking. Our main concern is with Grim's pessimism-by-default regarding the impending obscurity of drinking ecologists. As we justify below, there are good reasons to be more optimistic.

Less grim than Grim

It is well established that excessive alcohol consumption is bad for mental and physical functioning – nobody should be surprised that heavy drinkers would be scientifically unproductive. But there is no theory implying a strictly linear relationship. In western cultures, alcohol consumption is related to many interacting motivations, both positive and

negative (Beveridge and Yorston 1999, Galen and Rogers 2004, Andersson et al. 2007, Neighbors et al. 2007). It is therefore reasonable to conjecture that there may be benefits from moderate drinking, while also asking at what consumption levels negative effects may dominate. Our interest lies not with an overall correlation, which may unduly reflect the poor performance of heavy drinkers, but rather with the shape of the underlying relationship. Unfortunately, Grim's cryptically transformed data shed little light on these questions.

Boosting creativity

One way in which moderate drinking can contribute to science is by increasing creativity; alcohol opens minds and promotes originality. Creativity is good for research, and can be viewed as a form of 'deviancy', i.e. thinking 'outside of the box' or counter to the prevailing conventions of scientific discourse (Kusa 2006). This idea gains credibility from the creative arts where many innovators and improvisers are recognised 'drinkers' (e.g. in jazz music, Tolson and Cuyjet 2007, and in the arts generally, Beveridge and Yorston 1999).

Are there accounts of such inspiration in science? One story concerns beer being the inspiration for the Nobel Prize winning physicist Donald Glaser who invented the bubble-chambers used to trace the path of energetic charged particles (Glaser 1952). Apparently he admits only that beer was used as a fluid in some of his early apparatus trials (Pinckard 2006). Fortunately, we need not rely solely on such anecdotes.

In controlled studies of subjects required to undertake 'scientific' tasks, prior alcohol intake is found to facilitate some creative functions and inhibit others, with 'significantly higher levels of originality' being the overall outcome in many cases (Norlander and Gustafson 1996, Norlander 1999). We acknowledge that causation runs both ways (a theme we return to below): comparable test subjects required to undertake creative tasks tend to end up with a significantly greater thirst than those required to perform more mundane chores (Gustafson and Norlander 1995).

A longer life

Moderate regular alcohol consumption provides significant health benefits (Mukamal et al. 2008). This makes sense given that ethanol is a naturally occurring compound, and humans (along with many primates) have evolved to include some alcohol in their diet (Dudley 2004). Thus moderate alcohol consumption lowers the risk of cardiovascular problems and increases overall life expectancy (Ellison 2002). Because wisdom usually comes with age, scientists who remain healthier and live longer

can surely do more valuable research over their lives than their abstemious peers.

Correlation and causes

Grim takes care to avoid claiming that he has proved anything about causation – but this significant detail is easily missed due to his promotion of one pet explanation. Finding believable alternative hypotheses that predict a correlation between publication success and alcohol consumption is easy.

Notably, third causal factors could explain the observed correlation, i.e. underlying factors of social and economic origin could explain both heavy drinking and less success in high-level research and publishing – in principle, without any causal link between the two outcomes. In general, people having to cope with difficult personal situations often drink more (Neighbors et al. 2007) – that they would also publish less should not come as a major surprise.

There is no shortage of alternative suggestions. We could speculate that scientists too overloaded and stressed with teaching undergraduates to have the time and piece of mind to do or write about research may also more frequently end up as heavy drinkers.

Finally, heavy drinking might not be the cause but the result, for example when researchers drown their sorrows after their papers are rejected. The title of Grim's paper could then read 'Journal rejection promotes alcohol consumption'. Absurd? Perhaps, but no more so than Grim's own suggestion. The point is that a simple correlation with numerous plausible explanations proves little.

Popper versus pets

Grim's study cleverly highlights a more general lesson. His analyses and presentation follow accepted practices in evolutionary ecology. These are too seldom challenged. It appears we only notice failings when we are motivated by finding ourselves in the study population. Popperian philosophy reminds us that while it is possible to reject those hypotheses that do not fit the facts, it is impossible to conclusively choose amongst those that do (Popper 1959).

We conclude that Grim's fairy tale about alcoholic Czech ecologists is incomplete. There is still hope for Bohemian ecologists and other scientists who enjoy an occasional drink or two – both those inside and outside of Bohemia. They may look forward to a longer, more creative, and more fun-filled life than their teetotal colleagues. Perhaps all of us, whether we drink or not, should think twice next time we promote our pet hypothesis through simple pattern fitting while neglecting plausible alternatives.

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