Death Tolls and our Perception of Human Fatalities

The news coverage of the recent earthquakes in Haiti and Chile has been dominated by reports of ever increasing death tolls. One of the British Academy-funded Newton International Fellows, **Dr Christopher Olivola**, *offers an explanation of why as individuals we react in such contrasting ways to different mortality rates.*

IMAGINE HEARING about two tragic events on the news: one in which 10 people have died and another in which 1,000 people have died. Surely you would probably feel worse about the latter, deadlier event. But would you feel *100 times* worse? Probably not, even though the latter death toll is indeed 100 times larger than the former. Now imagine that as you continue to follow these two stories it is suddenly announced that the death toll of each event has risen by 10. How much worse would you feel? For most of us, an increase from 10 deaths to 20 deaths seems, at least intuitively, like a huge difference, while an increase from 1,000 to 1,010 deaths feels like a relatively trivial increase in fatalities. Such reactions are all too human, yet they represent striking violations of the notion that every human life is equally important.

Diminishing sensitivity

A large body of research in psychology and economics has demonstrated what the above examples were meant to illustrate, namely that people tend to exhibit a diminishing sensitivity to human fatalities. In other words, as an event's death toll increases, each additional death seems less and less shocking to us, until the numbers are overwhelming and we succumb to 'psychic numbing' – the inability to distinguish between large death tolls on an emotional level.

This diminishing sensitivity to human life has enormous implications. Each year, millions of lives are lost to accidents, disasters, epidemics, armed conflicts, and other deadly events. Those of us living in wealthy industrialised nations have the material power to mitigate their impact and save lives. Yet our willingness to send aid to the victims of these events, or to pressure our governments into intervention, depends critically on the extent to which we are moved by the size of their associated death tolls. A diminishing sensitivity to fatalities involved means that public reactions to humanitarian crises and other tragedies will not be proportional to the numbers of victims involved, and may instead depend on other, less important factors.

Valuation through comparison

Although copiously documented, and despite having grave implications, the reason for our diminishing sensitivity to fatalities was, until recently, pretty much a mystery. However, in a paper published in December 2009 in the *Proceedings of the National Academy of Sciences*,[1] we offered an explanation for this pattern and tested some additional implications of our account. Our model builds on a recently developed psychological theory that was designed to explain how people evaluate abstract economic quantities, such as money, time, and probability. In contrast to standard models of decision making, which simply assume that we (somehow) have *absolute* built-in subjective values for sums of money and other variables, this theory posits that we evaluate quantities in a relative fashion. In order to do so, we compare target quantities to other comparison amounts that we have observed in the past. The subjective size or value we assign to an amount is simply its relative rank (or percentile) within the comparison set. According to this approach, then, absolute valuation is an illusion that actually comes about through relative comparisons.

In the case of human fatalities, the subjective 'shock value' (or 'disutility') of a given death toll (e.g., 100 dead) would be determined by comparing it to other deadly events drawn from memory, and seeing where it stands relative to those events. For example, we might compare it with disasters and wars that we have recently learned about from watching the news, reading a newspaper, or conversing with family, friends or colleagues. Thus, a given death toll will seem large if it happens to be larger than most of the other death tolls we've observed in the past (or small if it ranks below most of them), *regardless of its absolute magnitude*.

Personal experiences

A critical implication of this model is that a person's reaction to a given death toll will be governed by the distribution of comparison fatalities that she can draw from, which will be a function of her accumulated experiences. For someone accustomed to hearing about events

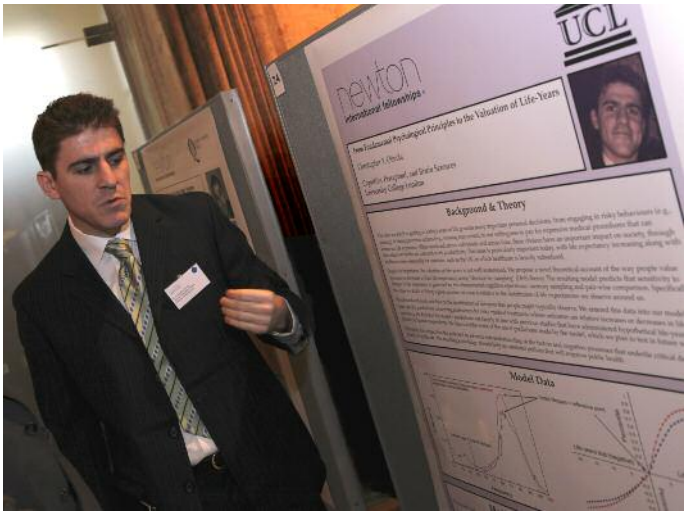

Figure 1. *At the event held on 16 February 2010 to showcase the Newton International Fellowships scheme, Dr Olivola gave a poster presentation on 'From Fundamental Psychological Principles to the Valuation of Life-Years'. Understanding how individuals perceive their own life expectancy, and adjust their behaviour accordingly, has enormous implications for health policies. Photo: Tracey Croggon.*

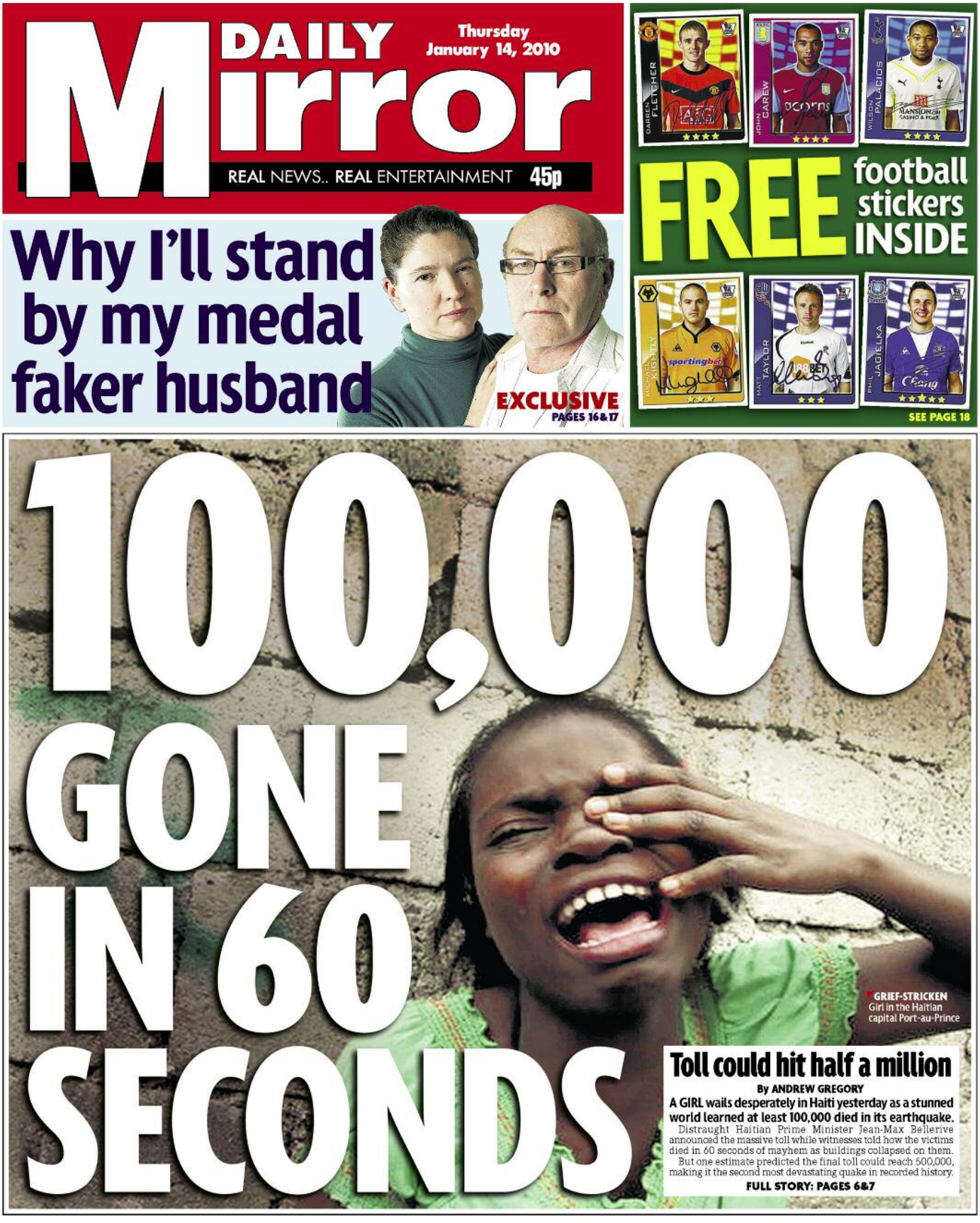

Figure 2. *The front page of the 'Daily Mirror', 14 January 2010, reports the Haiti earthquake. 'Toll could hit half a million' speculates the sub heading. Image: Mirropix.*

Figure 3. *A Georgian soldier studies a list of casualties in the short war between Russia and Georgia, August 2008. Despite early claims of 'thousands' of civilian victims, the death toll in the war seems to have been in the hundreds. Photo: Dimitar Dilkoff/AFP/Getty Images.*

involving thousands of deaths, a hundred fatalities will not seem very shocking, while the opposite would be true for someone who was only used to hearing about events involving fewer than a hundred deaths.

So how does this account explain our diminishing sensitivity to human fatalities? It turns out that the deadliness of an event is inversely related to its frequency: most events involve very few deaths, while only a few events involve many deaths. As a consequence, our model predicts that we will be highly sensitive to differences between small death tolls and highly *in*sensitive to differences between large death tolls. The diminishing sensitivity to human life thus stems from the distribution of death tolls we tend to observe and the relative comparison process that governs our evaluations.

National differences

An interesting prediction that comes out of this model is that sensitivity to human fatalities should differ across countries, according to the distribution of death tolls they are typically exposed to. In a country such as the UK, which is unused to mass deaths, a medium-scale disaster will seem really shocking, but the shock value will quickly start to blur as the numbers increase so that large-scale events will seem indistinguishable. However, in a country where mass deaths are more common, a medium-scale disaster may seem less shocking, but people will be more sensitive to differences in magnitude between large-scale events because they have observed many more of them. To test this prediction, we surveyed respondents in India, Indonesia, Japan, and the US. As the model predicted, we found evidence of greater diminishing sensitivity to fatalities in the latter two countries (which tend to experience relatively fewer large-scale disasters) than in the former two.

In sum, this new research stresses that our responses to humanitarian crises are fundamentally relative and shaped by the environment we live in – in particular the frequency with which we observe small or large death tolls in the news and in our day-to-day lives. On a theoretical level, our model and results fundamentally challenge the view that the value we place on human lives is governed by stable underlying disutility functions. On a practical level, they advance our understanding of people's reactions to humanitarian crises and other deadly events. For example, it would seem that wealthy nations, which have the resources to help those countries most affected by mass deaths, also have populations that are most likely to show a diminishing sensitivity to human fatalities. We hope this knowledge will ultimately help save many lives.

Note

1 Christopher Y. Olivola & Namika Sagara, 'Distributions of observed death tolls govern sensitivity to human fatalities', *Proceedings of the National Academy of Sciences of the United States of America*, 106:52 (29 December 2009), 22151–22156. www.pnas.org/content/106/52/22151.abstract

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