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AJNR

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Be Generous!**

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AJNR Am J Neuroradiol 2014, 35 (8) 1447-1448

doi: <https://doi.org/10.3174/ajnr.A3775>

<http://www.ajnr.org/content/35/8/1447>

This information is current as
of May 14, 2024.

A Call to Action: Maintain Your Happiness, Be Generous!

M. Castillo, *Editor-in-Chief*

Generosity comes in many flavors: the giving of time, resources, goods, and, of course, money. No matter what is given, Americans are considered to be most generous. With respect to donating money, in 2006 Americans donated over \$295 billion, which, corrected for inflation and population changes, made for a 190% increase compared with 50 years previously. Americans donate more than the citizens of any other country, encouraged by a tax system of deductions.¹

“Generosity” is defined as the habit of giving without expecting anything in return. The practical manifestations of generosity are donations. In basically all religions, generosity is rewarded, and in Buddhism, it is the opposite of greed. Americans who donate give one-third to religious institutions, the rest to secular causes, and it is known that “religious and conservative” individuals donate more than nonreligious liberal individuals.

The University of Notre Dame’s initiative, the Science of Generosity, explores the relationship between philanthropy, volunteerism, and altruism. This initiative gives about \$3 million annually for research, and in its first year, 2009, it received over 600 proposals, of which 9 were funded. A list of currently funded projects can be found at: <http://generosityresearch.nd.edu/current-research-projects>. An interesting project funded by this institution looked into the genetic origins of altruism in young children.² The authors found that the presence of the arginine vasopressin (AVP) receptor 1A leads to a lower altruistic proclivity. In short, AVP serves as a peripheral hormone that regulates water balance and has effects in the hippocampi and amygdalae. It is also thought that AVP plays some role in the brain’s dopaminergic mechanisms because its sites of expression are somehow related to those of the dopamine reward-associated pathways. Oxytocin is also involved in mediating generosity. In one experiment, individuals injected with 40 IU of this hormone were found to be 80% more generous than those who received a placebo.³ This last study comes from the Center of Neuroeconomics Studies headed by Dr Paul J. Zak, a mathematician and economist with postdoctoral training in neuroimaging at Harvard. Dr Zak believes that oxytocin is our “moral molecule,” and he has written a popular book about it.⁴ It seems that oxytocin is also associated with feelings of well-being, and that is why individuals who give feel pleasure at doing so.

*Only 7% of ASNR members donated to our Foundation in 2012 (and most were members of the Executive Committee). The total donations for that year were slightly over \$300,000, but this included 7 corporate donors and 1 practice group donor. Conversely, more than 60% of the ASNR staff, who get paid much less than physicians (average salary for radiologists in the United States: \$349,000 per year in 2012), donated to the Foundation last year.

<http://dx.doi.org/10.3174/ajnr.A3775>

fMRI shows activation of the precuneus and lingual gyri when generosity is called for, and greater lingual gyral activation is associated with an increased propensity to give.⁵ The same brain regions are used when taking an outside perspective of one’s self, thinking about the death of a loved one, and recalling vivid memories of one’s life. These thoughts bring us closer to mortality, and the feeling presumably triggers a desire to leave a legacy and give. What is fascinating is that generosity is its own reward because it results in additional oxytocin release and increasing feelings of happiness (not a “vicious” but a “virtuous” cycle). Whether we are being generous for our own benefit or acting that way on behalf of others, the brain activates and produces identical feelings of reward.

Happiness leads to generosity, and this idea is explored in Richard Powers’ wonderful book *Generosity: An Enhancement*.⁶ In it, a young woman with excess happiness that leads to marked generosity is thought to harbor the gene for happiness/generosity and is exploited and, not surprisingly, abused by the media. Of course, such a condition does not exist, and in the book, it serves as a device to tackle the idea that some excessively generous individuals are viewed by society as anomalies. What is true is that some bipolar individuals express extreme happiness during their hypomanic periods, which disastrously leads to periods of mania and/or depression.⁷ The “syndrome of excess happiness” may be a serious psychiatric condition.

Happiness is now more popular than ever. The Greater Good Web site (www.greatergood.com) contains more than 400 articles dealing with happiness and, specifically, how to bring up happy children. Extreme and constant happiness leads to decreased creativity.⁸ Extreme happiness also leads to riskier behaviors, such as binge eating, sexual promiscuity, and drug abuse. Children who are considered very happy have higher mortality rates because they tend to engage in riskier behaviors. The problem is also that the term “happiness” is really an umbrella that encompasses different types of feelings and not just one. What is even worse, obsessively pursuing happiness makes you unhappy.

Does having money (lots of it) make us happier and more generous? The best rated jobs in the United States are dentists and physicians; and though they are not the best paid ones, no one in these professions lacks money.⁹ Although among physicians, radiologists are number 3 on salary scales, they do not even rank in the top 10 when job happiness is evaluated.¹⁰ If asked, only 50% of all physicians stated that they would study medicine again. Judging by donations, specifically those to the Foundation of the American Society of Neuroradiology (ASNR), I cannot say that neuroradiologists are very generous.* An informal poll, taken by myself, tells me that neuroradiologists are not happy with their salaries (think they should get more) and especially are not happy with the idea of lower ones in the next few years. How much money is needed to be happy?

Daniel Kahneman, a Princeton psychologist who won the Nobel Prize for economics in 2002, has explored the issue of money and happiness. He has concluded that happiness and a sense of

well-being increase with salary but just up to US \$75,000 per year.¹¹ Above that amount, there are no more increases in happiness (however people making at least that amount are twice as happy as those making, on average, US \$20,000 per year). He suggests that higher income buys satisfaction but not happiness. Moreover, individuals earning higher incomes tend to be tenser, lose their ability to savor small pleasures, and spend less time doing activities they enjoy. It is also clear that lower income correlates with unhappiness and that increases in salary lead to only transient happiness due to the phenomenon of “adaptation.” Among other factors, even college education has little to do with happiness but clearly correlates with stress. Having children is the biggest contributor to unhappiness; they lead to constant feelings of stress, sadness, and worry.¹²

In one study, actors were asked to express feelings of happiness and sadness while examined with fMRI.¹³ In both states, activation occurred in the frontal lobes, anterior temporal lobes, and the pons. Although the regions were similar for both emotional states, different subregions were activated for each. In a different fMRI study, the mode and tempo of music were manipulated to be perceived as either sad or happy and the former elicited responses in the left orbito- and mid-dorsolateral frontal cortices.¹⁴ Happy voices elicit stronger and different fMRI responses than angry ones.¹⁵ Body postures may also indicate happiness or other emotions. When observing human body postures, our brain always records 2 things: action and emotion. These states activate visual representation/motion processing and emotional interpretation areas. Both areas are activated simultaneously but differently in men than in women.¹⁶ Men seem to show more reliable activation but in lesser amounts than women.

It seems to me that we neuroradiologists have every reason to be happy, and despite that, only a small group of us are generous with our money and time. Generosity is generally encouraged by the so-called “immediacy bias,” better known as a “call to action.” Crises and feelings of uncertainty and worry lead to greater donations. What better call to action than the lack of scientific evidence of what we do and the ever-decreasing government funding of research? If we do not support our Foundation, these issues will never be solved. If we continue to be as happy as we are now and do not increase our generosity by contributing to our Foundation, our jobs and other sources of happiness will soon disappear.

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EDITORIAL

Level 1 EBM Expedited Review

J.S. Ross

A recent poll of Canadian researchers identified the top 3 factors that influence where they send their own manuscripts: 1) ensuring methodologic soundness by peer review, 2) journal reputation, and 3) fast publication.¹ The *AJNR* (independent of this poll) has recognized these important factors, as well as the competitive nature of scientific publishing, by the introduction of a Level 1 Evidence-Based Medicine Expedited Program. The details of this significant program are defined on the *AJNR* Web site (see the “Author Info” section). Briefly, the program entails a very fast peer review time of 5–7 days, followed by an immediate editorial decision. The length of time from acceptance of the final revision to electronic publication would be 4 weeks. Other perks of this program include the waiving of various fees, such as the open access, color, and over-the-limit word count charges.

What is level 1 evidence? That depends. Levels of evidence were initially defined in 1979 by the Canadian Task Force on Periodic Health Examination.² Sackett³ further defined this in 1989 in an article looking at the evidence for antithrombotic agents. This seminal paper was barely 2 pages in length. Since that time, interest in this subject has exploded, and there are now

<http://dx.doi.org/10.3174/ajnr.A4047>