

DSM-Twitter: Are we happy or sad right now?

By Neil Seeman and Carlos Rizo

Sadness is a global phenomenon. It is also challenging to measure in a timely manner. Imagine if we could measure it in real-time and reach out to those in need with more immediacy. We think we can.

March 12, 2009 (CBC.ca) – Canada’s happiness index has risen to the level of Denmark’s for the first time in two decades, capping a five-year run on the back of booming demand for the nation’s improvement in mental health. The Canadian happiness index rose as high as \$1,000.800 smiley emoticons before dipping to 998.700 smiley emoticons at 4:16 p.m. on the New York exchange. It has soared 62 percent from a record low of 617.667 smiley emoticons in 2002. The Canadian happiness currency last closed above \$1M on Nov. 25, 2008, when Stephen Harper was Canada’s prime minister. In other news...

Researchers are accustomed to estimating the prevalence of mood disorders through surveys or through analysis of physician billing databases. The data are disquieting. In any given year, surveys suggest about [8% of Canadians will suffer clinical depression](#) at some point in their lives. Other approaches to measuring prevalence rates include reviewing expert opinion and conducting epidemiological surveys.

Dr. Dan Bilsker and colleagues showed in a [2007 paper](#) in the *Canadian Journal of Psychiatry* that the physician-treated prevalence of depression in British Columbia grew from 7.7% in 1991-1992 to 9.5% in 2000-2001. More than 95% were seen by family physicians, and in the final year, just 7.5% were seen by psychiatrists. In an alarming statistic just published in the same journal, Mel Slomp and colleagues in Alberta, using physician databases, report a 35% treated prevalence rate for mental disorder (mainly anxiety and depression) for adults seen over a three-year time period.

Introducing DSM-Twitter: A real-time happiness measure

There are roughly 8 million Twitter users, according to a [February 2009](#) report by Compete.com. As the online encyclopedia [Wikipedia](#) explains, Twitter “enables its users to send and read other users’ updates (known as tweets), which are text-based posts of up to 140 characters in length. Updates are displayed on the user’s profile page and delivered to other users who have signed up to receive them.”

We were curious as to what Twitter would reveal about the mental health of Canadians. The results are fascinating. So-called “tweets” are often accompanied by “emoticons”. In Twitter, the emoticon :) or :-) means happy or joyful. The emoticon :(signifies sad. The double string, :) :), means *very* happy or :(:(means *very* sad.

Using our real-time analysis, there were 417 tweets – within 15 miles of Toronto – expressing sadness (or what Twitter calls a “negative attitude”) during 17 minutes on March 12 (from 1:06pm EST to 1:23pm EST). During the very same time frame, there were 1,500 tweets from Toronto showing happiness or a “positive attitude.” This suggests that the ratio of happy comments to sad comments in the Toronto area was 3.6 to 1.

Is DSM-Twitter “scientific”?

The scientific process is in flux – in large part because the dynamic data available on the Web are growing at a stunning pace. Admittedly, our approach is far from perfect. Among other things, expressions of sadness may result from Twitter service outages, downturns in the stock market, bad sports results, frustrating weather conditions, traffic, or even the playful use of the emoticons. Still, social networking and micro-blogging services such as Twitter are entirely public (to which users consent), increasingly rich – and free! – tools of analysis. This, while the old-world scientific method is under renewed attack because of alleged bias, plagiarism and even [fraud](#), [inadequate methodology](#), and the fraternity-esque culture of [peer review](#). We feel that peer review, critique, replication and validation are essential to innovation. However, we do need to quicken the pace of inquiry in order to enrich our understanding of the fast-changing world.

New paths of investigation

In a 12-hour period on March 12, we found 260 Vancouver-area tweets (connecting from many gadgets, including cell phones and Blackberries) which demonstrated joy. Eighty Vancouver-region tweets expressed sadness during this same time.

It may be unsettling to know that we might be sadder than earlier survey findings indicate. Yet, at the same time, it is exciting that we may have a way of capturing mood trends in real time. With Twitter, we may even have a new device to help reach out directly to the people who are suffering right now. One tweet at a time. :)

Neil Seeman is Director and Primary Investigator of the Health Strategy Innovation Cell, based at Massey College, University of Toronto. He is “the Thank you Twitterer” at <http://www.twitter.com/neilseeman> and writes on health innovation for Longwoods and the National Post. Carlos Rizo is the Innovation Cell’s Chief Imagineer. He has a Twitter grade of 98/100 (<http://twitter.com/carlosrizo>). Correspondence: neil.seeman@utoronto.ca