



Grinners & Grouches

GROUP PHOTOS REFLECT
THE MOOD OF THE MOMENT



Social Mood Can Be Evident in Facial Expressions

By Alan Hall

Videography by Ohki Komoto

This month, *The Socionomist* presents a special video that explores an emerging idea that may lead to new sociometers. We recommend that you click on this link: <http://bit.ly/18I9g1k>, or type it into your browser to watch the 18-minute video. This transcript includes only the most important visuals.

When he addressed the April 2013 Social Mood Conference, Robert Prechter mentioned facial expressions:

Social mood is an unconsciously shared motivational impulse arising from social interaction independently from events. We are not really sure how social mood is communicated. It is communicated by what people say, surely, but there are probably many things ... that are more unconscious: The way that facial muscles change, for example. We might be hearing content on television, but we are also getting messages [from] facial expressions.

Social mood is unconscious, but it influences conscious emotions, which are visible in facial expressions. “The face is one of the richest sources of communicating affective and cognitive information,”¹ which simply means that we can tell a lot about what others are feeling and thinking by their facial expressions. In fact, we think that scanning and evaluating faces to gauge the emotional state of individuals and groups is a deeply ingrained survival behavior. And because of technology, reading faces is about to become even more important.

Facial recognition technology is a hot topic and getting hotter. With cameras and image-analysis software proliferating across the planet, people are increasingly worried about vanishing privacy. But, faces are more than just “the new fingerprints,” as National Public Radio put it.² Potential uses of facial recognition are far broader than just identifying people. Eventually, the collective emotion

revealed in faces may constitute a useful sociometer and improve predictions of crowd behavior.

Faces May Reveal Social Mood

Chapter 14 of *The Wave Principle of Human Social Behavior* (1999) lists many behaviors and emotions that people tend to display in response to social mood.

Let’s look at the two poles of one of those categories in particular, “Confidence versus Fear: A positive

POLES OF EXPRESSION FOR SOCIAL MOOD

Positive mood / Negative mood



© Prechter 1999

mood trend leads to speculation in the stock market and in business. A negative mood trend causes risk aversion in the stock market and in business.”

Do people who are risk-averse due to negative social mood display different facial expressions than do people during positive-mood, confident periods? And if so, how reliably do they do so?

To explore that question, let's start with two iconic examples. Subscriber William Lauber, Portfolio Manager at Sterling Capital Management, posted the following Reuters story³ to the Socionomics Institute's group page on LinkedIn. The story read like this:

Here's a snapshot of FDR & Co. in 1933 as they signed Glass-Steagall [right], which separated the financial sector into safer, deposit-taking commercial banks and risk-taking investment banks.

And here's a photo of Bill Clinton & Co. repealing Glass-Steagall in 1999 [below], with the

passage of the Graham-Leach-Bliley act known as the Financial Services Modernization Act.

It's a simple story. The two groups display polar opposite demeanors. The first group was in the grip of extremely negative social mood in 1933. Their negative emotions were plain on their faces and in



Source: Reuters

Negative Emotions: FDR & Co. in 1933 as they signed the Glass-Steagall Act.



Source: Justin Lane, The New York Times

Positive Emotions: Bill Clinton & Co. repealing the Glass-Steagall Act in 1999.

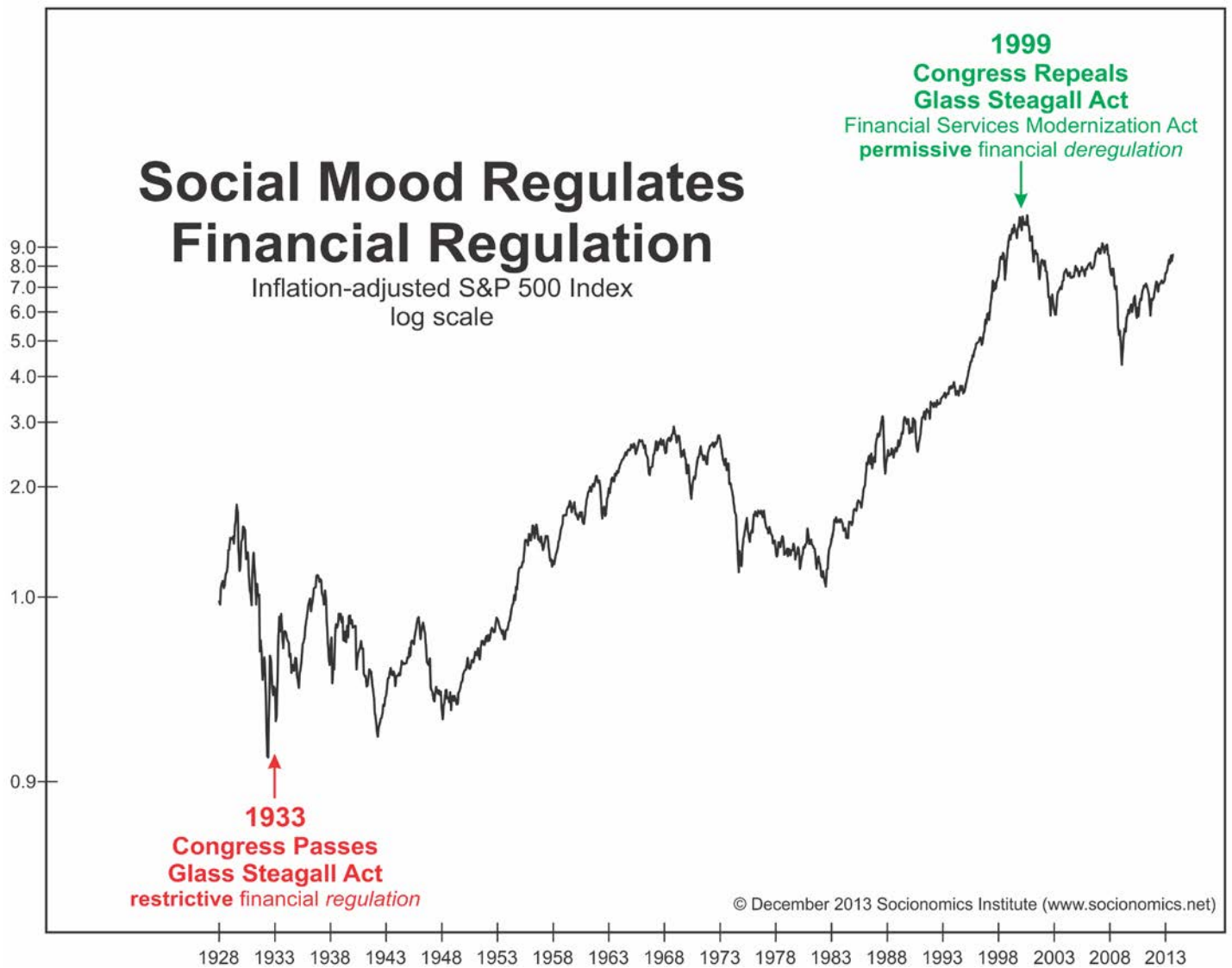


Figure 1

their actions. They were grim, unenthusiastic, risk-averse, seeking safety and signing regulation to rein in speculation.

Of the nine visible faces in the first group, the tallest man in the center is the only one who *might* have been smiling, only 11% of the group. In contrast to him, President Roosevelt, “had the look of one who had drunk the cup of life and found a dead beetle at the bottom,” to quote the 1930s humorist, P.G. Wodehouse.

The second group was in the grip of extremely positive social mood in 1999. Their positive emotions were plain on their faces and in their actions. They were ebullient, risk-embracing, seeking adventure and signing deregulation to allow and encourage speculation.

The second group was *unanimously* smiling—100% of the visible faces. The change in social mood from 1932 to 1999 was evident not only in stock prices and the radical shift from restrictive financial

regulation to permissive deregulation, but perhaps also in the emotions revealed in the legislators’ facial expressions.

Figure 1 shows the pinpoint accuracy of the socio-nomic timing of these two regulatory actions. In 1933, Congress passed laws designed to *prevent* the crash that had already happened. In 1999, Congress passed laws designed to *encourage* the rally that had already happened.

So, we see some reasons to believe that social mood might be reflected in facial expressions. Let’s consider a more-recent example of lawmakers signing restrictive financial regulation.⁴

The Dodd–Frank Wall Street Reform and Consumer Protection Act of July 21, 2010 was a reaction to the largest financial crisis since the Great Depression, and it contained the most significant financial regulatory reform since the Great Depression. At this signing



(see above photo), the Dow Jones Industrial Average was down almost 30% from its October 2007 high, and while most of these legislators were smiling, they certainly were not all grinning.

As Figure 2 shows, social mood at the time of the signing, indicated by the red circle, was trending negatively at Supercycle degree and positively at Cycle de-

gree. The expressions of the group at this bill's signing are just what a socionomist would expect: That is, they are *mixed*.

A Broader Survey

We wondered how well the social mood/facial expression association would hold up when investigated more broadly. To find out, we did a quick, informal survey via Google image searches.

We looked for the best-quality photos from the United States that showed lots of faces from one group over a long period of time. One particular group-photo series stood out—the semi-annual meetings of the American Astronomical Society.⁵ The following two pictures show how the group's facial expression changed over time. We think this kind of analysis will become far more sophisticated in coming years.

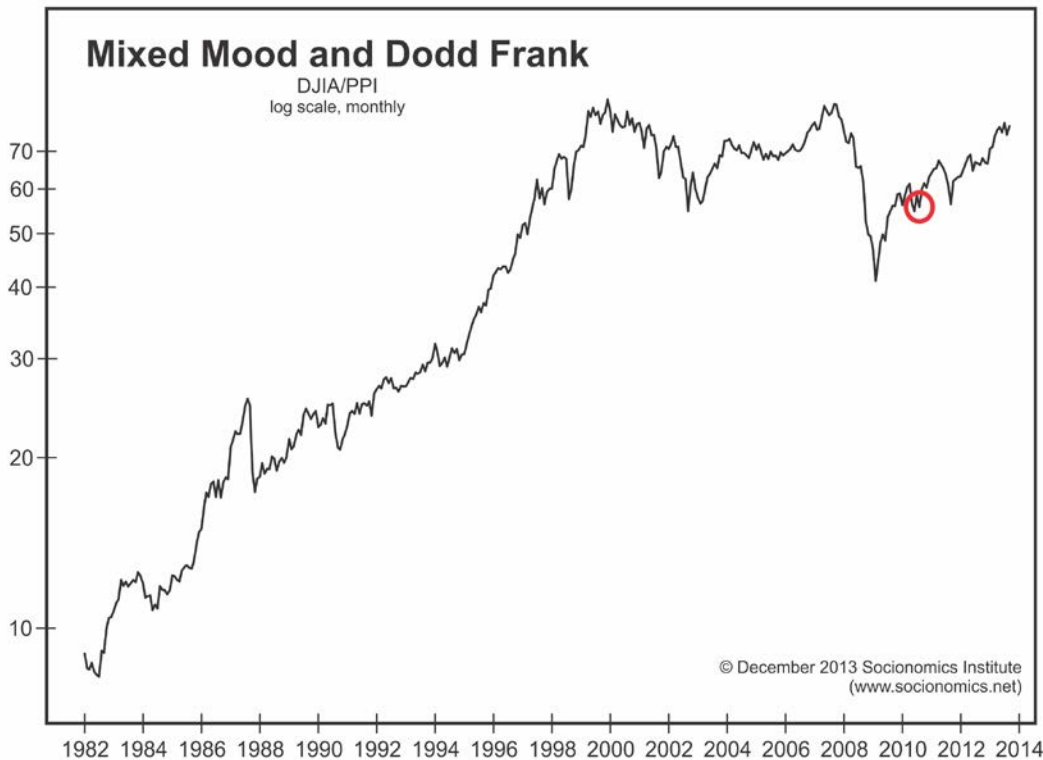


Figure 2



11/15 7/14 50/103 = 49% Smilers
FORTY-SECOND MEETING OF THE AMERICAN ASTRONOMICAL SOCIETY, OTTAWA, AUGUST 26-29, 1929.

Above is a photo of the August 1929 meeting showing our analysis marked in red. We divided the group into sections to make the smilers easier to count. Granted, the analysis is qualitative and subjective, but it is not too hard to differentiate smiling, happy faces from those that are not. Of the 103 members whose faces were visible, 49% were smiling.

The photo below shows the December 1932 meeting of the American Astronomical Society. The Dow Jones Industrial Average had collapsed during the intervening four years, and social mood was near a historic negative extreme. The contrast between the 1929 and 1932 facial expressions is stark. Only 8% of the group was smiling in 1932. From



6/76 = 8% smiling
FORTY-NINTH MEETING OF THE AMERICAN ASTRONOMICAL SOCIETY, ATLANTIC CITY, DECEMBER 27 TO 29, 1932.

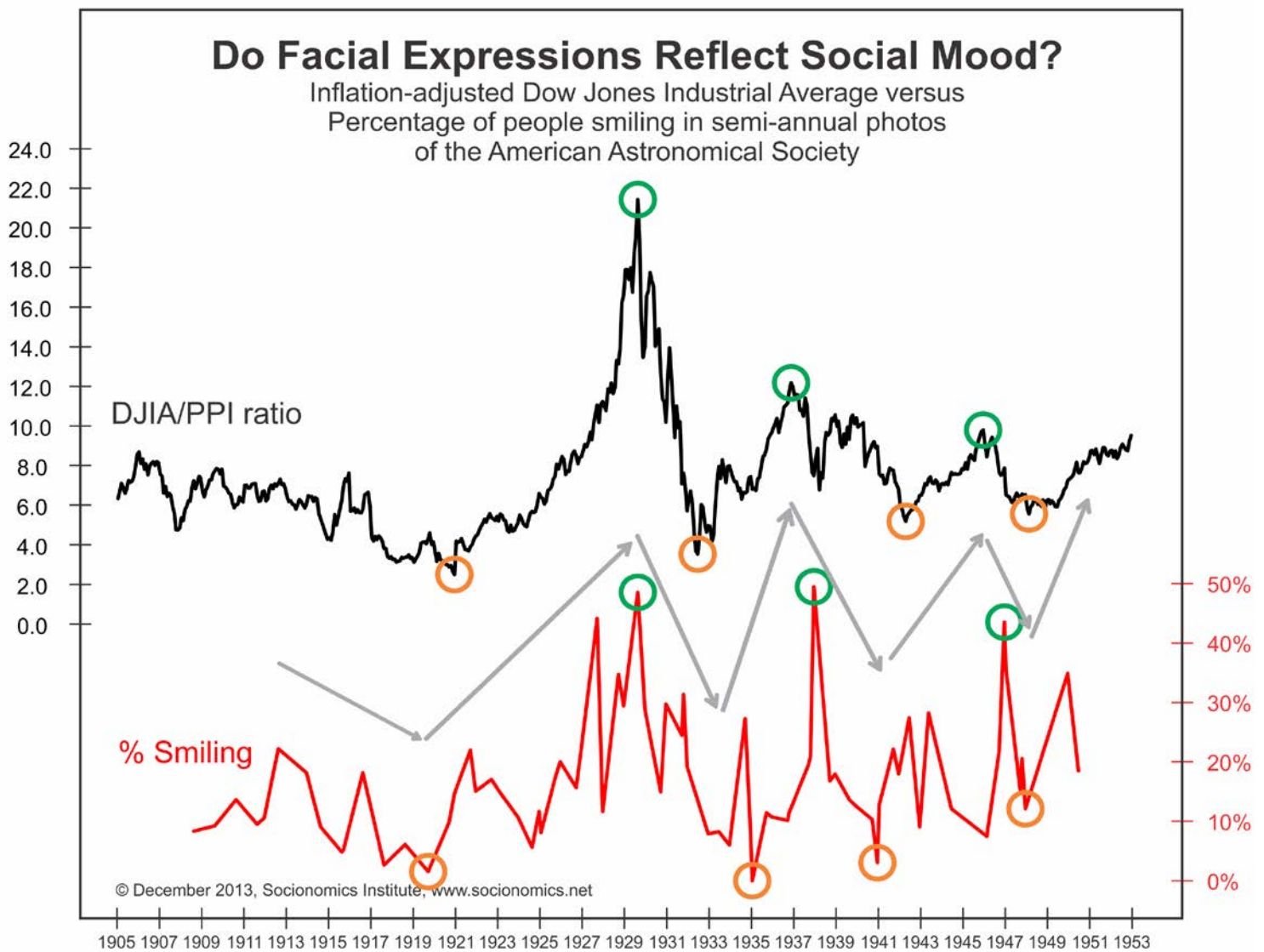


Figure 3

1929 to 1932, there was an 84% drop in smiling in the group, commensurate with the 89% drop in the Dow.

At that same group's December 1933 meeting, which coincided with the worst economic and political news of the Great Depression, only 6% of the astronomers were smiling. That is an 88% decline from 1929.

We did an informal analysis of all of the American Astronomical Society's 73 group photos that began in 1908 and ended in 1950. The top line in Figure 3 plots the inflation-adjusted Dow Jones Industrial Average, and the bottom line graphs the percentage of people smiling in each photo.

There are some resemblances between the graphs. For example, the three highest peaks in smiling occur near or soon after the three highest peaks in stocks (green circles).

Four of the lows in each graph are also somewhat near to each other (brown circles), though they are less perfectly aligned.

And the general trend of each graph is somewhat similar (gray arrows).

We looked at numerous other group photos, as well. We concluded that even though such snapshots hint at the sociometric potential of facial expression analysis, they don't reflect broader social mood as well as the stock market. Group photos show only a tiny fraction of society at a moment in time. Available, periodic photo series of members of the same organization are too rare for a statistical study. We lack consistent data over time. And, there is always the possibility that someone will cut a joke, or something else, just before the photographer trips the shutter, triggering laughter and producing false results.

But, we think these problems will eventually vanish, as technology makes facial expressions as easy to record and analyze as it has Twitter posts. Continuous monitoring, recording and analysis of facial expressions across broader segments of society will eventually provide enough data to support a valid study.

We hope other researchers see the value in this observation. The Socionomics Foundation will be happy to support any such work.

Crowd Facial Expressions Could Become a Useful Sociometer

Here is a prediction: Facial recognition and analysis technology will change the way we study crowd behavior. People, companies and governments are already recording and storing digital images today that will provide rich datasets for future analysis. Our small-scale study of the facial expressions in old photographs is only a tiny hint of what will be possible with computer algorithms that automatically analyze hundreds of thousands—or even hundreds of millions—of facial expressions over time. Eventually, there will be enough data to reveal a strong association between trends in social mood as reflected in stock markets and trends in collective emotion as revealed in facial expressions.

The people in all the previous pictures knew that they were posing for group photos, yet the influence

of social mood is still anecdotally evident. Photos of unaware subjects in crowds are different, yet they also seem to reflect social mood.

For example, this cropped photo (below) shows a tiny portion of Ronnie Miranda's GigaPixel image of many of the 100,000 hockey fans that crowded into the streets of Vancouver, Canada in June 2011. Miranda took the photo two hours *before* Game 7 of the Stanley Cup Final ended. You can click on <http://bit.ly/IC53TG> or type it into your browser to view the entire, amazing image and zoom into almost every one of the thousands of faces in it.

Notice the generally unhappy facial expressions, which reflect less-than-positive emotions. Since no one is smiling, the faces suggest that the crowd's social

Eventually, there will be enough data to reveal a strong association between trends in social mood as reflected in stock markets and trends in collective emotion as revealed in facial expressions.

mood was predominantly negative. And although this photo doesn't tell us about the immediate direction of the mood trend, what happened next does. Miranda assembled his massive image from 216 high-resolution photos taken over a 15-minute span near 5:46 PM on June 15, 2011. That was just two hours before Game 7 of the 2011 Stanley Cup Final ended at 7:45 PM, and the Vancouver Stanley Cup Riot erupted.



Generally Unhappy Facial Expressions: Less-than-positive emotions suggest the crowd's social mood was predominantly negative.



Brewing Anger: This photo, from another part of the crowd, shows no people smiling.

Above is another zoomed image from a different part of the huge crowd. Again, we see 0% people smiling.

And below is a third image. Although these three zooms come from different places in the crowd and were likely taken several minutes apart, the faces express similar emotion. While it is possible to find people smiling in the larger image, a careful count would find a very low percentage of them.

Your mother would probably tell you to avoid being a member of a crowd that is displaying these kinds of facial expressions. Socionomists would agree.

The riot that followed Miranda's photos (right) injured at least 140 people and nine police officers.



Riot: The gathering ended in vandalism and violence.



Yet Another Perspective: Again, no smiles.

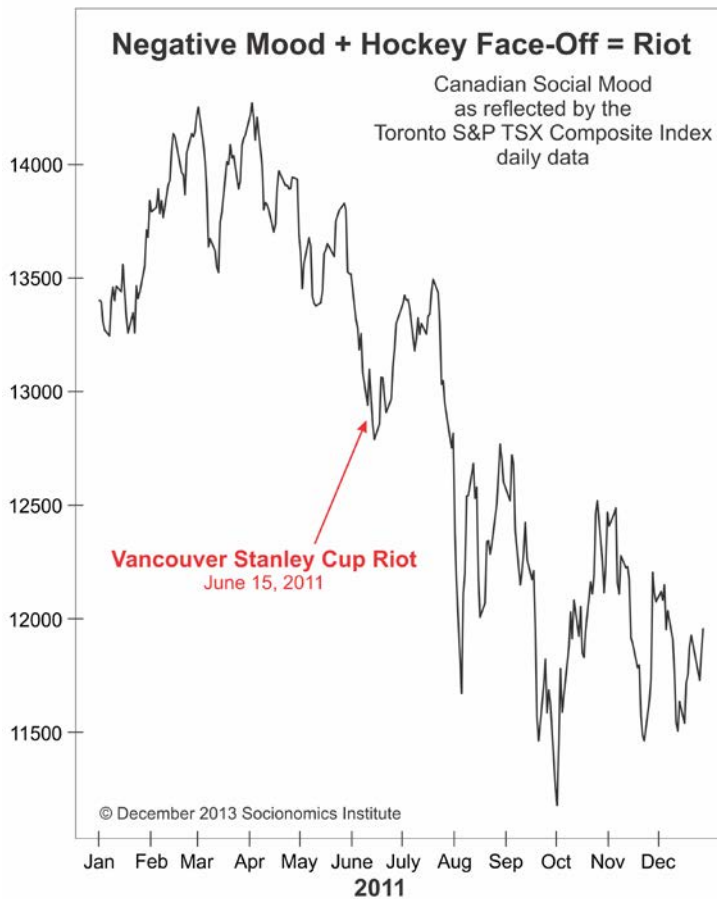


Figure 4

At least four people were stabbed.⁶ Rioters overturned and burned cars, smashed storefronts and looted stores. Property damage estimates exceeded \$4 million.⁷

We think that social mood played a role in the riot, because it erupted after a 9% decline within a larger 22% bear market in the Toronto S&P/TSX Composite Index (see Figure 4). The unreasoning, impulsive nature of the melee was evident in this observation from the Vancouver Police Chief, who said, “[Most] of the people who joined in the riot and who have now been charged represent a wider spectrum of young people, *many of whom do not have criminal records.*”⁸

In similar fashion 17 years earlier, the 1994 Vancouver Stanley Cup Riot also occurred after Game 7 of the Stanley Cup Finals. The June 14 riot *followed* a 12% drop in the S&P/TSX Composite Index (see Figure 5). Property damage was about \$1.73 million in today’s dollars.⁶

We think the stock market declines and the sour faces in the hockey crowd reflect the same thing: a negatively trending social mood.

As you can see in Miranda’s ocean of faces, photographic technology is progressing rapidly.

The robotic camera mount that automates this gigapixel photography process and the software to assemble the image cost less than \$1,000.⁹

The technology for facial recognition and analysis is also making huge strides. For example, Affectiva, which began in MIT’s Media Lab, has developed software that can “recognize human emotions¹⁰ based on facial cues or physiological responses.”¹¹ RealEyes is another emotion-detection software company,¹² as is Emotient,¹³ which describes itself as “the leading authority on facial expression recognition and analysis technologies that are enabling a future of emotion aware computing.”

The advertising industry is driving much of this technology as retailers seek feedback to improve their sales. Academia is interested too. For example, a recent study from North Carolina State University used software that analyzed facial expressions of students and allowed researchers to recognize when they were having trouble or finding the work too easy.¹⁴

On August 21, The New York Times reported that the US government is stepping up its facial rec-

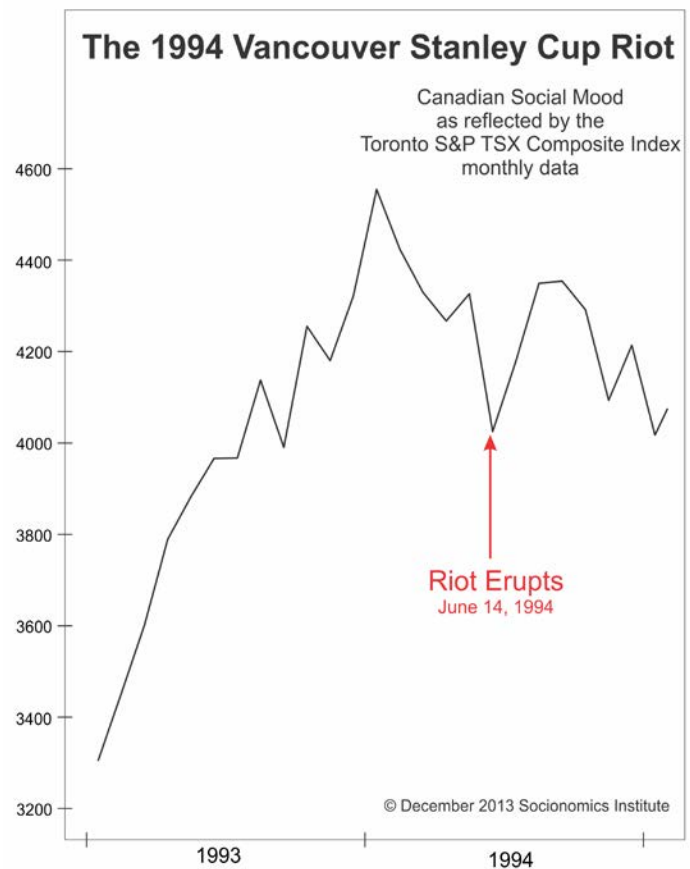


Figure 5

ognition capabilities too, although it seems concerned mostly about identification for now.

The federal government is making progress on developing a surveillance system that would pair computers with video cameras to scan crowds and automatically identify people by their faces The Department of Homeland Security tested a crowd-scanning project called the Biometric Optical Surveillance System—or BOSS—last fall after two years of government-financed development.¹⁵

A September 2012 paper, “Mood Meter: Counting Smiles in the Wild,” from a group of researchers at MIT comes closest to the sociometric applications we envision. The team installed cameras and video screens in four locations across the campus and used algorithms that recognized faces, evaluated whether people were smiling and estimated on a scale from 0 to 100 how big their smiles were.

They then averaged the expressions into a “happiness barometer.”¹⁶ The smiling barometer appeared to fluctuate over time. The researchers reported:

Quantitative analysis of the interactions revealed periodic patterns ... reflecting the emotional responses of a large community.¹⁷

The researchers wrote, “With the development of computer vision technology, now it is possible to capture spontaneous moments of individuals with their emotional footprints at various time units.”

The recording of millions of facial expressions over time, which is happening now on streets and in stores around the world, will eventually produce enough data to allow rigorous sociometric analysis. We expect the data will reveal that trends in social mood, as reflected in stock markets, *change before* corresponding trends in emotional expression.

Editor’s Note: *Stay tuned. As part of next month’s issue, we have prepared another video that describes emerging technologies that can detect emotional states. We expect many of these to become sociometrically important in the future.*

Citations on Page 12

Attend the 2014 Social Mood Conference and Put Yourself at the Forefront of Socionomic Research

The 2014 Social Mood Conference is coming to Atlanta and bringing with it some of the brightest financial minds, researchers and professionals in the world. We hope this who's who list includes you. Robert Prechter, who pioneered the study of social mood and the science of socionomics, will host practitioners and like-minded attendees at this fast-paced, daylong event. Past conferences drew rave reviews from speakers and attendees alike.

"The Summit is a must for those interested in socionomics. The speakers are exceptional."

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"Socionomics is a ground-breaking science whose subject matter is beneficial to all, regardless of interest or profession. Attending the Summit makes that very clear."

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class speakers with leading edge information."

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"The Socionomics Summit is a great venue for seeing what the leading thinkers in socionomics are up to and a chance to feel like you're a part of a rising school of thought."

— Conor Sen, 2012 Summit Attendee

"The Socionomics Summit is a great place to get a bigger and deeper picture of what REALLY drives the people to do what they do."

— David Lynn, 2011 Summit Attendee

"A very engaging examination of a vehicle that marries the aggregate psychology and ensuing market behavior of the past to the aggregate psychology and ensuing market behavior of the future."

— Jordan Kotick, Head of Technical Strategy, Barclays Capital, 2011 and 2013 Summit Attendee and 2012 Summit Speaker

Join us on April 5, 2014, and put yourself at the leading edge of social mood research. Registration opens January 1. For more information visit <http://www.socialmoodconference.com>.

The Socionomist is designed to help readers understand and anticipate waves of social mood. We also present the latest essays in the field of socionomics, the study of social mood; we anticipate that many of the hypotheses will be subjected to scientific testing in future scholarly studies.

The Socionomist is published by [Elliott Wave International](#) and the [Socionomics Institute](#), Robert R. Prechter, Jr., president; Mark Almand, director. Staff Writers: Alan Hall, Chuck Thompson, Euan Wilson. Editorial Direction: Dave Allman, Mark Almand, Pete Kendall. Cover Design: Eliot Bern. Production: Chuck Thompson. Proofreader: Ben Hall. Content Coordination: Astra Lureman. We are always interested in guest submissions. Please email manuscripts and proposals to Chuck Thompson via institute@socionomics.net. Mailing address: P.O. Box 1618, Gainesville, Georgia, 30503, U.S.A. Phone: 770-536-0309.

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Most economists, historians and sociologists presume that events determine society's mood. But socionomics hypothesizes the opposite: that social mood determines the character of social events. The events of history—such as investment booms and busts, political events, macroeconomic trends and even peace and war—are the products of a naturally occurring pattern of social-mood fluctuation. Such events, therefore, are not randomly distributed, as is commonly believed, but are in fact probabilistically predictable. Socionomics also posits that the stock market is the best available meter of a society's aggregate mood, that news is irrelevant to social mood, and that financial and economic decision-making are fundamentally different in that financial decisions are motivated by the herding impulse while economic choices are guided by supply and demand. For more information about socionomic theory, see (1) the text, *The Wave Principle of Human Social Behavior* © 1999, by Robert Prechter; (2) the introductory documentary *History's Hidden Engine*; (3) the video *Toward a New Science of Social Prediction*, Prechter's 2004 speech before the London School of Economics in which he presents evidence to support his socionomic hypothesis; and (4) the Socionomics Institute's website, www.socionomics.net. At no time will the Socionomics Institute make specific recommendations about a course of action for any specific person, and at no time may a reader, caller or viewer be justified in inferring that any such advice is intended.



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