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Beat Stress and Boost Your IQ

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Can Men and Women Really Be “Just Friends”?

Reruns of *Glee*
tonight?

He reminds
me of my
ex.

What would it be
like to kiss her?

Will her new
boyfriend
come
between
us?

I wonder if
he/she
wants more.

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HEAT-FUELED RAGE

Hotter weather sparks aggression and revolution

As the climate heats up, tempers may follow suit, according to a study published in August 2013 in *Nature*. Analyzing 60 quantitative studies across fields as disparate as archaeology, criminology, economics, geography, history, political science and psychology, University of California researchers found that throughout history and across the world, higher temperatures, less rainfall and more drought were consistently linked to increased violence. The correlation held true for aggression between individuals, such as domestic abuse and assault, but was even more pronounced for conflict between groups [see timeline on opposite page].

"We didn't expect for there to be nearly so many convergent findings among so many different researchers," says economist Solomon Hsiang, now at U.C. Berkeley, who led the study. "We were actually really stunned by the level of consistency in the findings that were out there and by the size of the effects we were observing." The researchers used statistical modeling to show that aggression scales with a combination of temperature, place and time—for example, if one U.S. county is three degrees Celsius warmer for three months or one African country is 0.6 degree C warmer for a year, statistics reveal an uptick in crime, violence and revolutionary fervor.

The reasons behind the climate-violence link are complex and not fully understood, although anyone who has lived through a heat wave can attest to one simple fact: "When people are hot, it makes them cranky," says Brian Lickel, a social psychologist who is on the faculty of the Psychology of Peace and Violence program at the University of Massachusetts Amherst and who was not involved in the study. "It makes people more prone to anger, it makes people more frustrated, and it makes decision making more

Too Hot to Be Angry? Multiple studies have proposed a link between hot weather and violent crime rates. Yet debate rages over whether aggression wanes at very high temperatures. Some interpretations of data for U.S. cities suggest temperature and violent crimes such as aggravated assault share a linear relation, with violence increasing at ever hotter temperatures. Other researchers argue that crime curves level off or even dip in supersweltering situations in ways that can vary with the time of day, the nature of the crime and even the season studied.

—Andrea Anderson



impulsive. And that can lead to altercations that escalate to more extreme levels of aggression."

Discomfort aside, the physical temperature of the brain may also play a role, according to Glenn Geher, director of evolutionary studies at the State University of New York at New Paltz, who also was not involved in the study. "There really is something to the idea of being 'hot-headed,'" he says. "Brain temperature, which is affected by ambient temperature, does seem to be associated with aggressive mood states and aggressive behavior." The bellicosity relates to a lack of oxygen in the regions of the brain that control our impulses, as the body directs more blood to the skin's surface in an effort to cool off, Geher explains. "So you get more emotional reactions and less prefrontal, step-back, cognitive-processing kinds of actions."

As for the protests, wars and revolutions supposedly fueled by sweat, the key factor may be survival, especially in drought-ridden areas. "When there are resource constraints—when there is lack of food, when there is lack of access to

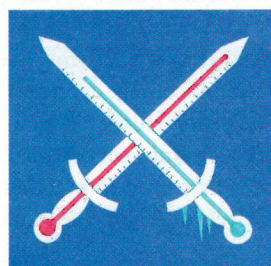
water, when there is economic destruction—then that is a potent predictor of conflict between groups,” Lickel adds. “When you’re in a society under stress and there is a danger of violence, people’s group identities become incredibly important, and violence begins to get organized around these group terms.”

Some critics have accused the study authors of scaremongering, playing up their dramatic results to take advantage of public concern about climate change. Yet decades of research support the link between hotter temperatures and increased violence, and this study—one of the largest analyses ever attempted—aligns well with an existing body of work. “I think the current study is impressive in how encompassing it is and how integrative it is,” Geher says. “If the data are right, there are some scary implications that I think people need to take into account.”

—Ajai Raj

COLD CONFUSION

The effects of low temperatures are harder to parse



Heat gets a bad rap for fueling human hostility. But what’s the deal when the mercury drops? The cold effect has been somewhat less studied, although there are hints that being uncomfortably chilly can contribute to conflict in some situations and quell it in others.

A Swiss-led group using tree-ring data to look at Central European summer climate patterns during roughly 2,500 years saw that periods of prolonged warming and of colder than usual spells coincided with social upheavals. As they reported online in January 2011 in *Science*, the researchers uncovered cold periods that overlapped with raucous historical events ranging from a Celtic expan-

sion around 350 B.C. to modern migrations from Europe to the Americas in the 1800s.

Likewise, a series of laboratory experiments dating to the mid-1970s suggest uncomfortable cold, as with uncomfortable heat, can push people’s aggression buttons. There is a debate about whether this effect tapers off at temperature extremes [see box on opposite page]. But from lab findings alone, it seems feasible that cold could stir up as much trouble as heat.

Nevertheless, most real-world studies suggest assaults—and many other crimes—wane in winter months and during cold snaps when temperatures dip below what is considered comfortable in a given climate. There are exceptions, including crime spikes in December and January, although researchers tend to attribute those to confounding circumstances such as the holiday season rather than the cold and more hours of darkness.

Such real-life patterns

point to cold’s potential for curbing crime and reflect some of the difficulties associated with trying to study crime triggers in a controlled setting. Unlike the lab, for instance, where scientists get final say over the temperature, people at large in the world are typically at liberty to add a layer or two. Experts also note that it is generally easier to get back to a comfortable body temperature when it gets nippy than when it is excessively hot.

Hot and cold weather prompt very different human behaviors. Whereas many head outside when the heat is on, extreme cold dissuades all but a hardy few from venturing out more than necessary, decreasing the chances that a would-be victim will run into a potential perpetrator. So although there are hints that cold snaps hasten upheavals and spark some forms of social stress, it seems that chilly temperatures could be off the hook when it comes to causing crime—at least for now.

—A.A.

CONFLICTS DRIVEN BY CLIMATE

Many societal upheavals throughout history may have been brought on or exacerbated by local changes in climate, such as unusual temperatures or rainfall patterns, according to a study by U.C. Berkeley public policy researcher Solomon Hsiang and his colleagues. Below are a few of the events the scientists statistically linked to climate shifts:

