A Milestone in Federally Funded Behavioral Science

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In the United States, medicine functions too much like a “repair shop,” believes David R. Williams of Harvard University’s T.H. Chan School of Public Health: People only seek medical advice when something goes wrong. This dysfunctional approach may explain why the United States shells out 50% of the world’s health care expenditures even though it represents only 5% of the world’s population. The nation also rank near the bottom of industrialized countries on health measures, according to Williams.

In recognition of the need to approach health holistically, the US Congress established the National Institutes of Health Office of Behavioral and Social Science Research (OBSSR) in 1995. OBSSR focuses on the study of the behavioral and social variables that can be as important to health as physiological causes can be. In June, OBSSR invited Williams and more than a dozen other speakers to a symposium charting the progress of US behavioral and social research over the past 20 years.

Eat Better, Live Better

One of those speakers was APS Fellow Julie A. Mennella, whose NIH-supported work on nutrition and the sense of taste exemplifies behavioral science research with the potential to prevent disease and improve health, starting with the very youngest Americans.

Mennella’s work demonstrates the simple importance of eating fruits and vegetables, especially for pregnant women, new mothers, and young children. Some of our ancestors, Mennella says, *loved* fruit. Scientists once hypothesized that the large molar teeth and strong jaws observed in the skeletal remains of some early hominins (e.g., *Paranthropus boisei*) facilitated a nut-rich diet. Today, anthropologist Peter Ungar at the University of Arkansas has put forth a new take on these “nutcracker” mouths: When he analyzed *P. boisei*‘s teeth, he found patterns of wear that were similar to patterns on teeth of fruit-eating animals. Although *P. boisei* was biologically equipped to eat tough foods, Ungar’s work suggests that they ate soft, squishy, sweet-tasting fruits. (In other words, they avoided eating the very foods they were adapted for when more palatable foods were in supply.)

Evolution has shaped the taste of foods children initially prefer or reject. In an environment with limited nutrients and abundant poisonous plants, sensory systems evolved to favor once-rare foods rich in energy (i.e., carbohydrates) and sodium — and to reject toxic ones that tasted bitter. In the modern United States, of course, such sweet and salty treats no longer are rare, and fruits and honey no longer are the sweetest foods available.

Americans face a “mismatch of inborn, evolutionarily driven taste preferences and [the] current food environment,” Mennella says. She fears that abundant, affordable processed foods rich in refined sugars and nonnutritive sweeteners may act as “supernormal stimuli” that do a better job of satisfying children’s biologically endowed sweet teeth than do healthy fruits.

But if this is the bad news, the good news is that a preference for healthy foods reinforces itself through learned behaviors passed from generation to generation. Like many other animals, humans learn eating behavior from their parents. Mennella has shown that our flavor preferences begin to form before our first taste of solid foods: The flavor of the mother's diet reaches her fetus through the amniotic fluid and after birth through mother's milk. In one study, Mennella showed that babies of mothers who had eaten carrots during either pregnancy or lactation enjoyed eating and ate more carrot-flavored cereal than babies whose mothers had avoided carrots during lactation and pregnancy. This learning continues throughout childhood.

The same pattern has been demonstrated in a range of other mammalian species and most recently in a nonmammalian species. A 2013 study led by French animal scientist Nadège Aigueperse showed that chicks whose mothers ate feed enriched with strong-tasting menhaden oil (which flavored the egg yolk) were more likely to prefer food enriched with menhaden oil after birth than were chicks whose mothers ate neutral-tasting soybean oil.

"Food," Mennella said, "is more than a source of calories." It also is a source of pleasure and cultural identity. Mennella wants parents to receive the support they need to make healthy food choices and teach their children to do the same.

"We can't focus on feeding infants and children separately from their families," she explained. "Experiencing these healthy foods, when [they are] part of the family's diet and food environment, helps children develop healthy preferences. Because consumption of vegetables (and some fruits) is so low among many children and their families, these children are deprived of the sensory experiences, parental modeling, and food environments needed to learn to like these foods."

Regulating Sleep to Regulate Mood

Our need to sleep is just as basic as our need to eat. Allison G. Harvey, a professor of clinical psychology at the University of California, Berkeley, celebrated the anniversary of OBSSR with a talk on sleep and mental illness.

Harvey noted a strong link between sleep and bipolar disorder, a mental illness marked by alternating episodes of mania and depression. When untreated, the disorder can lead to suicide or permanent disability. In bipolar individuals, disturbances in sleep often serve as an early warning sign of manic or depressive episodes. Furthermore, bipolar patients who struggle to get enough sleep are more likely to develop hypertension and obesity than bipolar patients who sleep well.

Harvey presented data showing that a cognitive-behavioral therapy intervention focused on sleep improving habits might help people with bipolar disorder avoid manic and depressive episodes and lead healthier lives. As part of her clinical research, she recruited 58 patients with bipolar disorder. Thirty of them received a cognitive-behavioral therapy for insomnia tailored for individuals with bipolar disorder, an intervention Harvey has named cognitive-behavioral therapy for insomnia-bipolar (CBTI-BP). The remaining patients served as a control group, receiving only psychoeducation.

CBTI-BP builds on several preexisting therapies. One key component is the late APS Board Member Dick Bootzin's original cognitive-behavioral therapy for insomnia (CBTI). CBTI has a track record of

helping patients build better sleep habits by going to bed when sleepy, waking at the same time each morning, avoiding naps, and using the bed only for sleeping — never for reading, watching TV, or snacking. Harvey's intervention also incorporated interpersonal and social rhythm therapy, a method for treating bipolar disorder developed by APS James McKeen Cattell Fellow Ellen Frank that emphasizes building a routine and maintaining strong social relationships. Harvey's team also encouraged patients in the study to dim the lights in their house at the same time every evening in order to support a natural sleep cycle. Finally, the experimenters asked patients to reflect on their own behavior and set their own sleep-related goals in line with a "motivational enhancement," a therapy method designed by APS Fellow William R. Miller and Stephen Rollnick.

After 6 months, patients who had received Harvey's CBTI-BP had spent an average of 3.3 days experiencing a bipolar episode compared to an average of 25.5 days experiencing an episode for the group that received psychoeducation.

Currently, Harvey and her team are working with community health centers in California to make CBTI-BP available a broader range of patients with severe mental illness. Whereas new interventions typically don't reach the general public until 15–20 years after their development, Harvey wants to make CBTI-BP available as soon as possible.

A Healthier Future

Funded by NIH, Mennella's and Harvey's work stand out as examples of social and behavioral research at its best: findings that can help make the public healthier. Drugs, X rays, and other traditional tools of modern medicine are godsends when our health requires a trip to the "repair shop," but behavioral advances are also important for our well-being. And they can limit the number of repair-shop visits we make in the first place.

References

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