

I 次の文章を読んで、問いに答えなさい。

After the U.S. Interstate Highway System was approved in 1956, planners decided that Highway I-40 would link Tennessee's big cities, from Knoxville to Nashville to Memphis. But in Memphis, locals looked at the proposed route of this highway and were shocked. It would run through Overton Park, a beloved local green space scattered with ponds, paths, and an area of old-growth forest¹. A citizens' group banded together to protest, but construction of the highway continued, getting ever closer to the park's border. As a final effort, the group made a legal complaint to the U.S. Supreme Court². Surprisingly, it won. I-40 was rerouted³, and the court's decision recognized that "protection of parkland" had to be considered in infrastructure planning.

The old-growth forest in Overton Park is an ecosystem of more than 140 acres⁴ that dates back at least 10,000 years. Such forests are great carbon sinks, pulling carbon dioxide from the atmosphere and storing it in their woody tissues for centuries. The large number of trees concentrated⁵ in a small area and their longevity⁶ are good for biodiversity. Old-growth forests have trees of a wide range of ages, forming a dense arboreal⁷ community for moss, insects, and small mammals.

However, the term "old-growth" is not clearly defined. It generally refers to forests that have been untouched for at least a century and are functioning ecosystems, with trees of various ages, dead material on their forest floors, and limited disturbance by humans. It's hard to estimate how much old-growth forest remains in the United States, yet old-growth forest survives in unexpected ways—and places. Particularly in the middle of a city, old-growth forests are rare, but there are urban examples scattered around the country. Their survival can be uncertain. "When developers or governments are looking for the next place to put a project, whether that

is a new highway, a new school, a new stadium, or a new sports park, they get out the maps and look for the ‘blank’ spaces,” said Joan Maloof, executive director of the Old-Growth Forest Network. “And guess where the forests are?” Maloof emphasized that many organisms depend on these last remaining parts of their habitat. For example, birds return to the same forests throughout their lives, and removing forests can cause birds to leave the area. A 2017 study showed that two species of birds negatively affected by rising temperatures from climate change were stable or increasing in number when in areas with old-growth forest.

The Old Forest of Overton Park was permanently protected as a state natural area only in 2011. Even with this status, there are conservation challenges when an old-growth forest is surrounded on all sides by city infrastructure. Invasive species⁸ can take a short trip from homes and garden centers. The full range of management strategies cannot be used, since something like prescribed burning⁹ is politically impossible in a dense urban area.

Old-growth forests need human protectors, although there are disadvantages to them being popular with the local community. The old oak and hickory trees that visitors admire in Overton Park require active management—otherwise, the forest might naturally transition to smaller trees such as maples, as the old trees die and fall. The park has a walking trail, but runners who frequent the area have made their own paths, possibly disturbing the ecosystem.

Co-existence can be challenging. Another example is Atlanta’s Fernbank Museum of Natural History, which was founded in 1939 to preserve the Fernbank Forest, one of the largest remaining parts of the Piedmont-region forest. The 65-acre forest hosts more than 200 species of native plants, upwards of 150 native animal species, and numerous fungi¹⁰, mosses, and bacteria. In 2012, after a 48-year lease to DeKalb County, the

museum took over its management. Lynn Anders, the museum’s director of outdoor programs, explained that before they could offer people access to the forest, they had to get it into better health. In 2012, it was filled with non-native invasive species and widespread biological pollution that prevented it from growing well. The real health test of an old-growth forest is in the top layer of the soil. Just an inch or two can take hundreds of years to form as dead material is broken down. If Fernbank Forest was going to invite people in, it needed to protect that delicate layer.

For that reason, the landscape architecture firm Sylvatica Studio designed a raised walkway that guides visitors through “WildWoods,” a green space that links the museum to the old-growth forest, with places where visitors can pause. The walkway was not built on the old-growth forest floor itself to protect it. “Having the forest open and accessible to all visitors is crucial for the museum, because it brings back the central, original mission of Fernbank—to preserve Fernbank Forest as a school in the woods for nature study,” Anders said.

This shows how public access that respects the original form of the forest can encourage future research and protection. Urban old-growth forests are small fragments of a vanished landscape, revealing how dramatically the environment of the United States has changed over hundreds and thousands of years.

(Adapted from a work by Allison C. Meier)

Source: Bloomberg News

(注)

- | | |
|-----------------------|----------------------|
| 1. old-growth forest | 原生林 |
| 2. U.S. Supreme Court | アメリカ合衆国の最高裁判所 |
| 3. reroute | 別のルートに変更する |
| 4. acre | エーカー (4046.86平方メートル) |
| 5. concentrated | 濃縮した |
| 6. longevity | 長命 |
| 7. arboreal | 木に生息する |
| 8. invasive species | 外来種 |
| 9. prescribed burning | 計画的な野焼き |
| 10. fungi | 菌類 |

〔1〕本文の意味、内容にかかわる問い(A)～(D)それぞれの答えとして、本文にしたがってもっとも適当なものを(1)～(4)から一つ選び、その番号を解答欄にマークしなさい。

(A) Why did the citizens in Memphis take their case to the U.S. Supreme Court?

- (1) Because they wanted to promote the value of parks
- (2) Because the destruction of their beloved park had begun
- (3) Because their protests had failed to stop the construction
- (4) Because the route of the highway was changed during construction

- (B) According to Joan Maloof, what do developers or governments do when searching for locations for new projects?
- (1) They ignore previously developed areas on the map.
 - (2) They identify unused areas on maps, which may be forests.
 - (3) They use maps to check where the forests are and avoid those areas.
 - (4) They examine maps to find forests and make those places the center of their projects.
- (C) Why is conserving the Old Forest in Overton Park difficult?
- (1) It is maintained by setting controlled fires.
 - (2) The damage it received before 2011 severely impacted its ecosystem.
 - (3) It is difficult to stop new buildings because of the legal status of the forest.
 - (4) Its location in the city increases the risk of being invaded by non-native species.
- (D) What was NOT true about Fernbank Forest in 2012?
- (1) Its soil was healthy due to a lack of dead material.
 - (2) It was a remaining part of the Piedmont-region forest.
 - (3) It contained native plants, animals, and tiny organisms.
 - (4) The forest needed to be in better shape before allowing visitors.

〔2〕 次の(1)～(5)の文の中で、本文の内容と一致するものには1の番号を、一致しないものには2の番号を、また本文の内容からだけではどちらとも判断しかねるものには3の番号を解答欄にマークしなさい。

- (1) The uniqueness of old-growth forests comes from having trees of a single age.
- (2) Urban old-growth forests are usually found in cities with smaller populations.
- (3) Some bird species in old-growth forest locations seem to be able to escape the effects of climate change.
- (4) Actively maintaining old trees in Overton Park can promote the growth of smaller trees.
- (5) Fernbank Museum's original mission included promoting nature study by keeping the forest open.

〔3〕 本文の内容をもっともよく表しているものを(1)～(5)から一つ選び、その番号を解答欄にマークしなさい。

- (1) Removing biological pollution from old-growth forests
- (2) Strategies for spreading old-growth forests nationwide
- (3) Preserving old-growth forests within urban environments
- (4) Contributions of old-growth forests as world heritage sites
- (5) Approaches to adapting old-growth forests for modern times

II 次の文章を読んで、問いに答えなさい。

We all want to be happy—and for decades, psychologists have tried to figure out how we might achieve that wonderful state. But researchers have recently realized that many studies were unreliable and unrepeatable. That has led to a closer examination of psychological research methods, with the study of happiness no exception. So—what *really* makes us happy? Based on today’s more careful research, some ways of achieving happiness seem to hold up¹, while others appear not to, or have yet to, re-prove themselves.

One long-standing theory is that smiling makes you feel happier. In a classic 1988 study, researchers asked 92 American undergraduates to hold a pen in their mouth either with their teeth, forcing an unnatural grin², or with their lips, making them pout³. These university students then looked at four examples of *The Far Side* comics. (A), those with the forced smiles found the one-panel comics slightly funnier than those with the forced pouts. But when 17 different research labs got together to retest the effects on 1,894 new participants, the finding^㊂ failed to hold up, the researchers reported in 2016.

The repetition study was part of a broader effort to deal with psychology’s reproducibility⁴ crisis, (B) the variety of ways in which researchers could examine and reanalyze their data until they arrived at publishable results. According to Elizabeth Dunn, a social psychologist, many research methods are like shooting arrows at the wall and drawing the target afterwards.

One solution has been for scientists to publicly declare, or preregister⁵, their analysis plans before they conduct their experiments. (C), they decide their research goals first. Dunn and her graduate student, Dunigan Folk, focused on such preregistered studies in their analysis, which

narrowed the vast field of happiness research to just 48 published papers. Even that small number is encouraging, says Brian Nosek, a psychologist executive director of a research group that aims to improve research reproducibility. “I was actually surprised that there were as many papers that qualified,” he says. “That really demonstrates that this area of research has adopted a lot of these new practices.”

Preregistration alone doesn’t guarantee that results will be trustworthy, nor does it solve all of psychology’s reproducibility problems. Quality studies also require well-designed methods and large and diverse sets of participants, for example. (D), most of the papers reviewed were high quality in those features beyond just preregistration, Dunn says. Even under the renewed examination, some of the conclusions regarding the paths to happiness held up, the researchers found—including practicing gratitude, being sociable, and spending money on other people.

In one recent study, for instance, researchers asked hundreds of parents to either write about how they spent their week or send a gratitude letter to someone they knew. Expressing gratitude resulted in more positive moods. In another recent study, scientists asked more than 900 undergraduates to express gratitude in letters, texts or social media, or to list their daily activities. Those in the gratitude group scored as feeling happier and more satisfied with their lives the following day. In both cases, it’s unclear how long this would continue.

Three different preregistered studies pointed to being social as beneficial. In one, scientists assigned 71 adults to pretend to be extroverted—“bold, talkative, outgoing, and active”—for a week, and another 76 to be introverted—“shy, sensitive, calm, and quiet.” Participants in the extroverted condition reported better moods during the study week, though the benefits were less clear for those who were naturally introverted.

Smiling to promote happiness was also supported by new, preregistered research—once scientists switched to (E). About two dozen labs from 19 different countries worked together to test the instruction to grip a pen in the teeth or to imitate the expression of a smiling person in nearly 4,000 subjects. Holding a pen in the mouth still didn't work, but people who were told to copy a smile did report better moods. Remarkably, this was true even if the subjects didn't believe it would work, another team reported in 2023.

Dunn cautions, (F), that participation in preregistered studies tends to result in small effects on happiness overall, in part because scientists can't massage the data⁶ to get bigger numbers. Other well-known approaches to researching happiness haven't met Dunn and Folk's standards—at least, not yet. The researchers didn't find clear evidence of benefits for volunteering, performing random acts of kindness⁷, or meditation. For example, a recent, preregistered study asked participants to perform acts of kindness for others, or for themselves, or simply to list what they did each day. Being kind to others over a four-week period (G) well-being. Dunn and Folk also didn't find any preregistered studies at all on exercising or spending time in nature, two often recommended strategies. That doesn't mean those strategies don't or can't work.

Dunn agrees that the review only covered the tip of the iceberg⁸ of happiness research. But (H) as more psychologists preregister their science as part of what some call a “Golden Age” in the field. As Dunn and Folk conclude, “happiness research stands on the brink of” an exciting new era.”

(Adapted from a work by Amber Dance)

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(注)

- | | |
|------------------------------------|-----------------|
| 1. hold up | 検証に耐える |
| 2. grin | (歯を見せた) にこやかな笑い |
| 3. pout | 口をとがらす |
| 4. reproducibility | 再現性 |
| 5. preregister | 事前に研究方法と計画を公開する |
| 6. massage the data | データを加工する |
| 7. perform random acts of kindness | 特別な理由なく人に親切にする |
| 8. tip of the iceberg | 氷山の一角 |
| 9. stand on the brink of ~ | ~を間近に控えている |

[1] 本文の ~ それぞれに入れるのもっとも適当なものを(1)~(4)から一つ選び、その番号を解答欄にマークしなさい。

- (A) (1) Besides (2) On average
(3) On the other hand (4) Thus
- (B) (1) which has been partly caused by
(2) which has led to
(3) which is unrelated to
(4) which prevented the use of
- (C) (1) By the way (2) In other words
(3) Moreover (4) Regardless
- (D) (1) Indeed (2) Instead
(3) Originally (4) Unfortunately

- (E) (1) active participants (2) forced pouts
(3) less introverted students (4) more natural grins
- (F) (1) consequently (2) falsely
(3) furthermore (4) however
- (G) (1) had unexpected effects on
(2) made no difference to
(3) resulted in obvious improvements in
(4) worked against one's
- (H) (1) kindness will spread
(2) more reviews will be written
(3) people will become happier
(4) that should expand

[2] 下線部 ㊸～㊻ それぞれの意味または内容として、もっとも適当なものを
(1)～(4) から一つ選び、その番号を解答欄にマークしなさい。

- ㊸ the finding
- (1) the results of the original research
(2) the ways in which students can hold pens
(3) the fact that some comics are funnier than others
(4) the discovery about what makes people feel uncomfortable

㉮ a lot of these new practices

- (1) ways to improve the quality of studies
- (2) improved techniques to more accurately hit targets
- (3) decisions to apply a wider range of research methods
- (4) ways of registering to read better-written journal papers

㉯ this

- (1) feeling happy
- (2) students being online
- (3) being more active each day
- (4) parents receiving thank-you letters

㉺ this was true

- (1) changing methods was surprising
- (2) telling people to work together helped
- (3) holding a pen in one's mouth worked better
- (4) imitating facial expressions created positive feelings

㉻ That

- (1) Criticizing the new way of doing research
- (2) Having small sample sizes of study participants
- (3) The lack of studies using the newly recommended standard
- (4) The absence of research about particular happiness measurements