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A. Reading Comprehension: There will be 5 short articles and 5 items after each article. Please identify the choice that best answers the question. (Total 25 items, 2 points each; Total 50 points for Part A)

Items 1-5 are based on the following paragraphs adopted from the blog post in Nature on Sep. 2, 2015.

"Not quite salve et vale yet," Oliver Sacks signed off a letter to me at the end of June, expressing the hope that he'd visit London again in the time he had left. The treatment he received earlier in the year had, he said, done "a very good job clearing out the majority of the metastasis in my liver", and I allowed myself to be optimistic about seeing this remarkable, terminally ill man once more.

That's not how it worked out. With his death at the end of August I – and many others – lost a friend whose generosity and sympathy of spirit were constantly inspiring. That Oliver would find the time to write at all when his remaining days were clearly so few, and when he had "case histories, essays etc, short and long" – and apparently several books too – still to complete will not surprise anyone fortunate enough to have felt his kindness. That his comments would stroll from the virtues of the Japanese "actor-magician" Yoshi Oida to Shakespeare's belief that the fern can confer invisibility typifies his boundless curiosity. But who else wielded such breadth this lightly? Who, while afforded tremendous acclaim, was ever so devoid of ego?

This was one of the qualities that lifted Oliver's writing to canonical status, and not just within the confines of "science writing" (he was rightly uncomfortable with being labeled thus). His subject was that of novelists, philosophers, poets, humanists of all descriptions: what is often rather grandly called "the human condition". But in Oliver's books and essays, the humanity was immediate and intimate, coming not from sweeping generalizations or lofty pronouncements but from deep within the grain of individual experiences. His concern was not "humanity" as such; it was people.

In all of the extraordinary, sometimes bizarre and baffling case histories that he described, he sought out what they revealed about our own fragile existence and what was unique and valuable in the lives of these people who often faced unimaginable challenges. To do this without mawkishness or sentimentality, yet with enormous empathy and even affection, required not just a rare talent with words but exquisite sensitivity. It is a fittingly Sacksian question to wonder (without expecting answers) how all this came about. Oliver's account of his early life, in the first volume of his autobiography, Uncle Tungsten (2001), tells of his affluent, intellectual Jewish family in north London, whose scientific inclinations – his father was a general practitioner – might have been expected to launch him on just the kind of path it did: into neurochemistry and then consulting neurology. It offers no real clues about what would turn him into a writer with a unique ability to translate the clinical work of a neurologist into insights both beautifully lucid and movingly profound.

It does, however, hint at the beginnings of the loneliness that seemed to me to linger in the background even while Oliver was among friends and colleagues who shared a great deal of mutual affection. He writes in his second autobiographical volume, On the Move (2015), of "the habits of a lifetime' s solitude, and a sort of implicit selfishness and self-absorption" . Well, maybe; you might guess the former, not the latter. I was delighted, then, that Oliver found love again in 2009 at the age of 77.

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It was Oliver' s passion for chemistry, revealed in Uncle Tungsten, that brought us into contact, when I discovered to my surprise and delight that he had read the books I' d written on the subject. His friends, the chemists Roald Hoffmann and Bassam Shakhashiri, rightly file Uncle Tungsten alongside Primo Levi' s The Periodic Table as one of the "great chemistry classics of all time": two books that put chemistry on the required reading list. These books are not "about science" but simply and undemonstratively let science assume its place in culture. Like Levi, Oliver was a great writer whose subjects often happened to be scientific.

The first time I met him, in the harsh New York winter of 2003, I witnessed the irresistible strength of his chemical enthusiasms, undiminished since the days he tossed lumps of sodium into High-gate Pond in north London with his boyhood friend, the polymath Jonathan Miller. With barely a word of introduction but with eyes sparkling, he beckoned me eagerly into his kitchen, where next to the bowls of nuts he had laid out as much of the periodic table as he possessed (which was most of it), encouraging me to listen to the "cry of tin" and to handle the round ball of mildly toxic cadmium.

I do not envy anyone the necessary task of sorting through Oliver' s unpublished writings – which, he admitted, "spreads onto the backs of envelopes, menus, whatever scraps of paper are at hand". The correspondence alone will be enormous – he kept it all. It should also be delicious. "I enjoy writing and receiving letters," he wrote. "It is an intercourse with other people, particular others." That concern with the particulars of others is what makes all his writings so bountiful; I see now that is why he wrote – and with generous and life-affirming energy – in June. Several writers have written about coming to terms with terminal illness, and many accomplish it with grace and courage. I' m not sure, though, that any of these accounts has been as uplifting as what indeed proved to be Oliver' s salve et vale in The New York Times in February. "It is up to me now to choose how to live out the months that remain to me", he wrote. "I have to live in the richest, deepest, most productive way I can… I have been a sentient being, a thinking animal, on this beautiful planet, and that in itself has been an enormous privilege and adventure." It has been an enormous privilege that he has shared the adventure with us.

1. According to the above text, what would best describe the late Oliver Sacks? a (a) science writer; (b) cognitive scientist; (c) humanist; (d) neural surgeon
2. What was the subject that brought the writer of this blog post with Oliver Sacks? (a) neuroscience; (b) chemistry; (c) physics; (d) mathematics
3. What are the writing habits of Oliver Sacks, according to the text? (a) using a laptop; (b) writing with pencils and papers of whatever kind; (c) telling his secretary to type his words; (d) working in front of a desktop computer.
4. How did Oliver Sack live out the rest of his life (especially year 2015)? (a) kept working until the end; (b) stayed in the hospital to fight his illness; (c) stayed at home waiting for the unavoidable; (d) travelling the world to say farewell to friends/colleagues.
5. According to the text, which book do you think would be written by Oliver Sacks? (a) Brain, Vision, and Memory; (b) The Blind Watchmaker; (c) How the Mind Works; (d) An Anthropologist on Mars.

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Items 6-10 are excerpts from the forewords of the "Good Natured-The Origins of Right and Wrong in Humans and Other Animals, 1996" by Frans de Waal.

In addition to being human, we pride ourselves on being humane. What a brilliant way of establishing morality as the hallmark of human nature-by adopting our species name for charitable tendencies! Animals obviously cannot be human; could they ever by humane? If this seems an almost-rhetorical question, consider the dilemma for biologists-or anyone else adopting an evolutionary perspective. They would argue that there must at some level be continuity between the behavior of humans and that of other primates. No domain, not even our celebrated morality, can be excluded from this assumption.

Not that biologists have an easy time explaining morality. Actually, there are so many problems with it that many would not go near the subject, and I may be considered foolish for stepping into this morass. For one thing, inasmuch as moral rule represents the power of the community over the individual, it poses a profound challenge to evolutionary theory. Darwinism tells us that traits evolve because their bearers are better off with them than without them. Why then, are collective interests and self-sacrifice valued so highly in our moral systems?

Debate of this issue dates back a hundred years, to 1893 when Thomas Henry Huxley gave a lecture on "Evolution and Ethics" to a packed auditorium in Oxford, England. Viewing nature as nasty and indifferent, he depicted morality as the sword forged by Homo sapiens to slay the dragon of its animal past. Even if the laws of the physical world-the cosmic process-are unalterable, their impact on human existence can be softened and modified. "The ethical progress of society depends, not on imitating the cosmic process, still less in running away from it, but in combating it."

By viewing morality as the antithesis of human nature, Huxley deftly pushed the question of its origin outside the biological realm. After all, if moral conduct is a human invention- a veneer beneath which we have remained as amoral or immoral as any other form of life-there is little need for an evolutionary account. That this position is still very much with us is illustrated by the startling statement of George Williams, a contemporary evolutionary biologist: "I account for morality as an accidental capability produced, in its boundless stupidity, by a biological process that is normally opposed to the expression of such a capability."

In this view, human kindness is not really part of the larger scheme of nature: it is either a cultural counterforce or a dumb mistake of Mother Nature. Needless to say, this view is extraordinarily pessimistic, enough to give goose bumps to anyone with faith in the depth of our moral sense. It also leaves unexplained where the human species can possibly find the strength and ingenuity to battle an enemy as formidable as its own nature.

Several years after Huxley's lecture, the American philosopher John Dewey wrote a little-known critical rejoinder. Huxley had compared the relation between ethics and human nature to that between gardener and garden, where the gardener struggles continuously to keep things in order. Dewey turned the metaphor around, saying that gardeners work as much with nature as against it. Whereas Huxley's gardener seeks to be in control and root out whatever he dislikes, Dewey's is what we would today call an organic grower. The successful

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gardener, Dewey pointed out, creates conditions and introduces plant species that may not be normal for this particular plot of land "but fall within the wont and use of nature as a whole."

I come down firmly on Dewey's side. Given the universality of moral systems, the tendency to develop and enforce them must be an integral part of human nature. A society lacking notions of right and wrong is about the worst thing we can imagine - if we can imagine it at all. Since we are moral beings to the core, any theory of human behavior that does not take morality 100 percent seriously is bound to fall by the wayside. Unwilling to accept this fate for evolutionary theory, I have set myself the task of seeing if some of the building blocks of morality are recognizable in other animals.

Although I share the curiosity of evolutionary biologists about how morality might have evolved, the chief question that will occupy us here is whence it came.... Do animals show behavior that parallels the benevolence as well as the rules and regulations of human moral conduct? If so, what motivates them to act this way? And do they realize how their behavior affects others? With questions such as these, the book carries the stamp of the growing field of cognitive ethology: It looks at animals as knowing, wanting, and calculating beings....

6. According to the text, what would be author' s perspective on animal' s morality? (a) Animals do not own capabilities to show morality; (b) The author shares the conviction of Henry Huxley that Homo Sapiens and animals of lesser status are distinctly divided by the sword of morality; (c) The author concurs with George Williams that "morality is an accidental capability by Mother Nature; (d) The author agrees with John Dewey that the relationship between animals' nature and morality are as garden and organic gardener.
7. According to the text, what do you think this book "Good Natured" is about? (a) about the fact that animals do have/own the capability of being moral; (b) about the conviction that humans are the only moral species; (c) about the claim that there are other aspects (such as brain size) that separate humans and animals of lower status; (d) that both humans and animals are not moral in nature.
8. What field does this book belong to? (a) moral philosophy; (b) moral psychology; (c) cognitive ethology; (d) cognitive neuroscience
9. From the context, where do you think the book author did his study? (a) North America; (b) Eastern Africa; (c) Western Europe; (d) Australia
10. The word "morass" in "I may be considered foolish for stepping into this morass" could be substituted by (a) mess; (b) mass; (c) molest; (d) mould.

Items 11-15 are based on the following article in Nature 182 (1958 July 12), 108, by the late Sir. Ronald Fisher.

LUNG CANCER AND CIGARETTES : THE ASSOCIATION observable between the practice of cigarette-smoking an the incidence of cancer of the lung, to which attention has been actively, or even vehemently, directed by the Medical Research Council Statistical Unit, has been interpreted, by that Unit, almost as though it demonstrated a casuals connection between these variables. The suggestion, among others that might be made on the present evidence, that without any direct causation being involved, both

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characteristics might be largely influenced by a common cause, in this case the individual genotype, was indeed rejected by one writer, although I believe that no one doubts the importance of the genotype in predisposing to cancers of all types. It seemed to me that although the importance of this factor had been overlooked by the Unit in question, it was well within the capacity of human genetics, in its current state, to examine whether the smoking classes, to which human beings assign themselves, such as non-smokers, cigarette smokers, pipe smokers, cigar smokers, etc, were in fact genotypical differentiated, to a demonstrable extent, or whether, on the contrary, they appeared to be genotypical homogeneous, for only on the latter view could causation, either of the disease by the influence of the products of combustion, or of the smoking habit by the subconscious irritation of the postulated pre-cancerous condition, be confidently inferred from the association observed. The method of inquiry by which such differentiation can be recognized is the same as that by which the congenital factor has been demonstrated for several types of disease, namely, the comparison of the similarities between monozygotic (one-egg) and dizygotic (two-egg) twins respectively; for any recognizably greater resemblance of the former may be confidently ascribed to the identity of the genotypes in these cases. I owe to the generous cooperation of Prof. F. Von Verschuer and of the Institute of Human Genetics of the University of Munster the results of an inquiry into the smoking habits of adult male twin pairs on their lists. The data so far assembled relate to 31 monozygotic and 31 dizygotic pairs, from Tubingen, Frankfurt and Berlin. Of the first, 33 pairs are wholly alike qualitatively, namely, 9 pairs both non-smokers, 22 pairs both cigarette smokers and 2 pairs both cigar smokers. Six pairs, though closely alike, show some differences in the record, as in a pair of whom one smokes cigars only, whereas the other smokes cigars and sometimes a pipe. Twelve pairs, less than one-quarter of the whole, show distinct differences, such as a cigarette smoker and a non-smoker, or a cigar smoker and a cigarette smoker. By contrast, of the dizygotic pairs only 11 can be classed as wholly alike, while 16 out of the 31 are distinctly different, this being 51 percent. as against 24 percent among the monozygotic. The data can be rearranged in several ways according to the extent to which attention is given to minor variations in the smoking habit. In all cases, however, the monozygotic twins show closer similarity and fewer divergences than the dizygotic. There can therefore be little doubt that the genotype exercises a considerable influence on the smoking and on the particular habit of smoking adopted, and that a study of twins on a comparatively small scale is competent to demonstrate the rather considerable differences which must exist between the different groups who classify themselves as non-smokers, or the different classes of smokers. Such genotypical different groups would be expected to differ in cancer incidence; and their existence helps to explain such oddities as that pipe and cigar smokers should show much less lung cancer that cigarette smokers, while among the latter, the practice of inhaling is associated with less, rather than with more cancer of the lung. Dr. Bradford Hill, while admitting that the evidence of association found by his Unit did not amount of proof of causation, has emphasized that he does not know what else it can be due to. The facts here reported do show, however, that the choice is not so narrow as has been thought.

11. According to the text, Sir Ronald Fisher in this Nature article intended to show that (a) there are other

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factors that commonly influence both smoking and lung cancer; (b) smoking did cause lung cancer; (c) rather than caused by smoking, lung cancer is in fact genetically determined; (d) rather than smoking causing lung cancer, it was the other way around (lung cancer causing smoking).

12. From which country did the author get the data of monozygotic and dizygotic twins? (a) England; (b) France; (c) Belgium; (d) German
13. From this article, you can infer that Sir Ronald Fisher was probably (a) not a cigarette smoker; (b) a pipe smoker; (c) neutral to the suggestion that smoking causing lung cancer; (d) against smoking
14. Also from the text, you can infer that Sir Ronald Fisher was probably a (a) experimental physiologist; (b) medical doctor; (c) social activist; (d) statistician
15. Can you, based from the modern knowledge about "smoking causing cancer", judge which of the following early counterarguments to be less incorrect? (a) that maybe it was the personality trait (e.g., introvert) that was more susceptible to both smoking and lung problem; (b) monozygotic (one-egg) and dizygotic (two-egg) twins shared similar rats of smoking and non-smoking rate; (c) that even there was a higher rate of monozygotic twins smoking than those of dizygotic twins, it may be also subject to other explanations (e.g., sample size too small); (d) that Sir Ronald Fisher as a paid consultant of tobacco companies was the primary reason that he objected "smoking causing cancer".

Items 16-20 are based from the following article which appeared in Nature on Feb. 12, 2014.

For a brief moment in 2010, Matt Motyl was on the brink of scientific glory: he had discovered that extremists quite literally see the world in black and white.

The results were "plain as day", recalls Motyl, a psychology PhD student at the University of Virginia in Charlottesville. Data from a study of nearly 2,000 people seemed to show that political moderates saw shades of grey more accurately than did either left-wing or right-wing extremists. "The hypothesis was sexy," he says, "and the data provided clear support." The P value, a common index for the strength of evidence, was 0.01 — usually interpreted as 'very significant'. Publication in a high-impact journal seemed within Motyl's grasp.

But then reality intervened. Sensitive to controversies over reproducibility, Motyl and his adviser, Brian Nosek, decided to replicate the study. With extra data, the P value came out as 0.59 — not even close to the conventional level of significance, 0.05. The effect had disappeared, and with it, Motyl's dreams of youthful fame.

It turned out that the problem was not in the data or in Motyl's analyses. It lay in the surprisingly slippery nature of the P value, which is neither as reliable nor as objective as most scientists assume. "P values are not doing their job, because they can't," says Stephen Ziliak, an economist at Roosevelt University in Chicago, Illinois, and a frequent critic of the way statistics are used.

For many scientists, this is especially worrying in light of the reproducibility concerns. In 2005, epidemiologist John Ioannidis of Stanford University in California suggested that most published findings are false; since then, a string of high-profile replication problems has forced scientists to rethink how they evaluate results.

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At the same time, statisticians are looking for better ways of thinking about data, to help scientists to avoid missing important information or acting on false alarms. "Change your statistical philosophy and all of a sudden different things become important," says Steven Goodman, a physician and statistician at Stanford. "Then 'laws' handed down from God are no longer handed down from God. They're actually handed down to us by ourselves, through the methodology we adopt."

P values have always had critics. In their almost nine decades of existence, they have been likened to mosquitoes (annoying and impossible to swat away), the emperor's new clothes (fraught with obvious problems that everyone ignores) and the tool of a "sterile intellectual rake" who ravishes science but leaves it with no progeny. One researcher suggested rechristening the methodology "statistical hypothesis inference testing", presumably for the acronym it would yield.

The irony is that when UK statistician Ronald Fisher introduced the P value in the 1920s, he did not mean it to be a definitive test. He intended it simply as an informal way to judge whether evidence was significant in the old-fashioned sense: worthy of a second look. The idea was to run an experiment, then see if the results were consistent with what random chance might produce. Researchers would first set up a 'null hypothesis' that they wanted to disprove, such as there being no correlation or no difference between two groups. Next, they would play the devil's advocate and, assuming that this null hypothesis was in fact true, calculate the chances of getting results at least as extreme as what was actually observed. This probability was the P value. The smaller it was, suggested Fisher, the greater the likelihood that the straw-man null hypothesis was false.

For all the P value's apparent precision, Fisher intended it to be just one part of a fluid, non-numerical process that blended data and background knowledge to lead to scientific conclusions. But it soon got swept into a movement to make evidence-based decision-making as rigorous and objective as possible. This movement was spearheaded in the late 1920s by Fisher's bitter rivals, Polish mathematician Jerzy Neyman and UK statistician Egon Pearson, who introduced an alternative framework for data analysis that included statistical power, false positives, false negatives and many other concepts now familiar from introductory statistics classes. They pointedly left out the P value.

But while the rivals feuded — Neyman called some of Fisher's work mathematically "worse than useless"; Fisher called Neyman's approach "childish" and "horrifying [for] intellectual freedom in the west" — other researchers lost patience and began to write statistics manuals for working scientists. And because many of the authors were non-statisticians without a thorough understanding of either approach, they created a hybrid system that crammed Fisher's easy-to-calculate P value into Neyman and Pearson's reassuringly rigorous rule-based system. This is when a P value of 0.05 became enshrined as 'statistically significant', for example. "The P value was never meant to be used the way it's used today," says Goodman.

16. What do you think the appropriate title of the above passage would be? (a) The origin of mistaken p-value; (b) How slippery the p-value is; (c) How Fisher and Neyman/Pearson conjured up the p-value; (d) The criticisms against the p-values are inconclusive.
17. Why did Matt Motyl, the psychology PhD student, failed to replicate the significant results on the relations

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between political standpoints and grayness perception? (a) he did not follow his advisor' s suggestions on the 2nd time; (b) he did not follow the same procedure as the first experiment; (c) he analyzed the 2nd experiment differently than that of the first time; (d) there was nothing wrong in his procedures, it is just the nature of the p-value.

18. What was Fisher' s original intention when he designed the p-value? (a) to make sure that the data was randomly sampled; (b) to make sure that the data worthy of the 2nd look; (c) to make sure that the null hypothesis was true; (d) to make sure that both Neyman and Pearson cannot argue against it.
19. What has p-value NOT been suggested, according to the text? (a) mosquitoes; (b) a "sterile rake" who ravished but left no offspring; (c) a rigorous decision-making procedure; (d) emperor' s new clothes.
20. In psychology, which p value has become the "gold standard" of statistical significance? (a) .01; (b) .05; (c) .001; (d) .005

Items 21-25 are based from the following content (extracted on Dec. 12, 2015, Nature).

The science myths that will not die -- False beliefs and wishful thinking about the human experience are common. They are hurting people — and holding back science.

In 1997, physicians in southwest Korea began to offer ultrasound screening for early detection of thyroid cancer. News of the programme spread, and soon physicians around the region began to offer the service. Eventually it went nationwide, piggybacking on a government initiative to screen for other cancers. Hundreds of thousands took the test for just US$30 - 50.

Across the country, detection of thyroid cancer soared, from 5 cases per 100,000 people in 1999 to 70 per 100,000 in 2011. Two-thirds of those diagnosed had their thyroid glands removed and were placed on lifelong drug regimens, both of which carry risks.

Such a costly and extensive public-health programme might be expected to save lives. But this one did not. Thyroid cancer is now the most common type of cancer diagnosed in South Korea, but the number of people who die from it has remained exactly the same — about 1 per 100,000. Even when some physicians in Korea realized this, and suggested that thyroid screening be stopped in 2014, the Korean Thyroid Association, a professional society of endocrinologists and thyroid surgeons, argued that screening and treatment were basic human rights.

In Korea, as elsewhere, the idea that the early detection of any cancer saves lives had become an unshakeable belief.

This blind faith in cancer screening is an example of how ideas about human biology and behaviour can persist among people — including scientists — even though the scientific evidence shows the concepts to be false. "Scientists think they're too objective to believe in something as folklore-ish as a myth," says Nicholas Spitzer, director of the Kavli Institute for Brain and Mind at the University of California, San Diego. Yet they do.

These myths often blossom from a seed of a fact — early detection does save lives for some cancers — and thrive on human desires or anxieties, such as a fear of death. But they can do harm by, for instance, driving

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people to pursue unnecessary treatment or spend money on unproven products. They can also derail or forestall promising research by distracting scientists or monopolizing funding. And dispelling them is tricky.

Scientists should work to discredit myths, but they also have a responsibility to try to prevent new ones from arising, says Paul Howard-Jones, who studies neuroscience and education at the University of Bristol, UK. "We need to look deeper to understand how they come about in the first place and why they're so prevalent and persistent."

Some dangerous myths get plenty of air time: vaccines cause autism, HIV doesn't cause AIDS. But many others swirl about, too, harming people, sucking up money, muddying the scientific enterprise — or simply getting on scientists' nerves.

Once a myth is here, it is often here to stay. Psychological studies suggest that the very act of attempting to dispel a myth leads to stronger attachment to it. In one experiment, exposure to pro-vaccination messages reduced parents' intention to vaccinate their children in the United States. In another, correcting misleading claims from politicians increased false beliefs among those who already held them. "Myths are almost impossible to eradicate," says Kirschner. "The more you disprove it, often the more hard core it becomes."

21. According to the text, why is it that even the widespread use of screening and intervention, the death rate due to thyroid cancer in South Korea remained the same? (a) Because the widespread screening did not change the diagnosis rate of thyroid cancer; (b) Because the prevalence rate of thyroid cancer did not change before and after the increased diagnosis; (c) Because somehow the treatment (surgery removal and drug regimens) was not effective at all; (d) Because it may be due to the false belief that early screening will always help save lives.

22. According to the text, which profession would be most interested in understanding the reasons behind the perpetration of scientific myths? (a) consulting psychologists; (b) molecular biologists; (c) educational neuroscientists; (d) mythologists.

23. Which of the following is not considered a "myth"? (a) MRI scan does not contain radiations; (b) vaccines cause autism; (c) HIV does not cause AIDS; (d) inserting "popcorn" messages in a movie caused the rise of popcorn selling.

24. Which of the following in not among the ingredients of a "myth"? (a) a fact; (b) human anxieties or fear of death; (c) the idea of "googling before sharing"; (d) the power of gossip.

25. Which method, according to the text, do you think will work better in dispelling the myths? (a) invite celebrities to do TV shows/advertisements to denounce the myths; (b) air more myth-buster messages in radios; (c) create websites to fight against the myths; (d) in fact, none of the above would easily work in dispelling the myths.

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B. Translation: Please read the following five passages and translate them into Chinese. (Total 5 passages, 10 points each; Total 50 points for Part B)

Passage #1 is adopted from Perspectives in Science on Jan. 1, 2016.

Evidence of a reward system was derived from experiments in rats some 40 years ago and has been confirmed by recent studies showing that rodents will choose to receive optogenetic stimulation of midbrain dopamine (DA) neurons [which were engineered to be activated by light]. The findings have been paralleled in humans by functional magnetic resonance brain imaging (fMRI); thus, the anticipation of reward evokes increased activity in the human ventral striatum. This correlated with indirect measures (from positron emission tomography) of DA release in the striatum. Exposure to both primary rewards (e.g., pleasant tastes and sights) and conditioned or symbolic rewards (such as money) leads to increased activity in the ventromedial prefrontal cortex (PFC). It is therefore paradoxical that hyperactivity of this region has also been linked in humans to anhedonia, the inability to feel pleasure. Removing this hyperactivity has been a target for various antidepressant treatments, including pharmacotherapy, cognitive therapy, and deep brain stimulation. Ferenczi *et al.* asked whether the effect of enhancing midbrain DA neuron activity is blunted by influences from the rat medial PFC.

Passage #2 is adopted from News & Views in Nature on Sep. 18, 2014.

Our memories are representations of past experiences that are believed to be encoded in networks of neurons that fire together or in sequence. The representation of a particular place — a 'where' memory — is encoded in a brain structure called the hippocampal formation, which is embedded within the medial temporal lobe. A separate representation in the amygdala of the brain encodes a 'what' memory, which recalls whether one feels good about a place (a positive valence) or has marked it off as dangerous (a negative valence). These two representations are thought to become connected during learning. The amygdala also has direct downstream connections to the action and endocrine systems that are involved in approach and avoidance.

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Passage #3 is adopted from Perspectives in Nature Reviews Neuroscience on Dec., 2012.

The predominance of females among patients with chronic pain might be explained in one of three non-mutually exclusive ways. First, it is possible that women simply seek out health care services at higher rates than do men and/or are more willing to report pain on surveys than men, and thus will be tallied higher in epidemiological studies of various types. Second, it is possible that women have higher susceptibilities to common chronic pain syndromes than men and thus will be more likely to develop conditions that feature pain as a symptom. Last, it is possible that women have a greater sensitivity to and/or a lower tolerance of pain than men, leading to higher percentages of women crossing the threshold at which experienced pain rises to the level of a diagnosed 'pain syndrome'. In this case, pain levels in pain syndromes experienced by both sexes would be expected to be highest in women. Note that higher pain sensitivity in women might be due to biological sex differences in ascending pain transmission pathways, descending pain modulation pathways and/or any number of psychological phenomena that affect pain. There are also various possible explanations for apparent sex differences in analgesic responsivity (for example, to opioids); these could be due to differential drug pharmacokinetics or pharmacodynamics or simply to different starting pain levels.

Passage #4 is adopted from a research article in Nature Neuroscience on Aug. 3, 2015.

This research also advances sociocognitive theories of impression formation. Trait learning has previously been examined through instructed or observational learning (for example, presenting trait-implying behavior descriptions), without feedback from social targets. We demonstrated that impressions may also be formed through feedback-based instrumental learning. Indeed, the instrumental processes examined here implicated neural regions involved in reward processing and impression updating, but did not significantly correlate with activity in dorsomedial prefrontal regions linked previously to instructed trait learning. Evidence for instrumental learning of traits complements previously studied trait learning processes, consistent with a multiple memory systems model of social cognition. More broadly, these findings reveal the promise of integrating behavioral economics, reinforcement learning and computational neuroimaging to illuminate complex human decision-making processes.

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Passage #5 is adopted from a research article in PNAS on Dec. 8, 2015.

Perceived social isolation (PSI) (loneliness) is linked to increased risk of chronic disease and mortality, and previous research has implicated up-regulated inflammation and down-regulated antiviral gene expression (the conserved transcriptional response to adversity; CTRA) as a potential mechanism for such effects. The present studies used integrative analyses of transcriptome regulation in high-PSI humans and rhesus macaques to define the basis for such effects in neuroendocrine-related alterations in myeloid immune cell population dynamics. CTRA up-regulation also preceded increases in PSI, suggesting a reciprocal mechanism by which CTRA gene expression may both propagate PSI and contribute to its related disease risks.