０１　【理学部】

英　語　問　題

2024(令和６)年度

【注意事項】

1. この問題冊子は「英語」である。
2. 試験時間は90分である。
3. 試験開始の合図まで，この問題冊子を開いてはいけない。ただし，表紙はあらかじめよく読んでおくこと。
4. 試験開始後すぐに，以下の５および６に記載されていることを確認すること。
5. この問題冊子の印刷は１ページから７ページまである。
6. 解答用紙は問題冊子中央に２枚はさみこんである。
7. 問題冊子に落丁，乱丁，印刷不鮮明な箇所等があった場合および解答用紙が不足している場合は，手をあげて監督者に申し出ること。
8. 試験開始後，２枚ある解答用紙の所定の欄に，受験番号と氏名を記入すること(１枚につき受験番号は２箇所，氏名は１箇所)。
9. 解答は必ず解答用紙の指定された箇所に記入すること。解答用紙の裏面に記入してはいけない。
10. 問題番号に対応した解答用紙に解答していない場合は，採点されない場合もあるので注意すること。
11. 問題冊子の中の白紙部分は下書き等に使用してよい。
12. 解答用紙を切り離したり，持ち帰ってはいけない。
13. 試験終了時刻まで退室を認めない。試験中の気分不快やトイレ等，やむを得ない場合には，手をあげて監督者を呼び，指示に従うこと。
14. 試験終了後は問題冊子を持ち帰ること。

〔 I 〕 次の文章を読んで，下の問いに解答欄の範囲内で答えなさい。

＊が付いている語句には本文の後ろに注があります。

One of the most famous—if *contentious—studies in social science is known as the marshmallow test. In the 1970s, that experiment probed kids' ability to delay *gratification when faced with a yummy snack. (ア)It turned out some kids can resist the *temptation to eat one marshmallow immediately if you tell them that waiting will earn them two marshmallows later.

But will a kid pass up a yummy snack altogether—not just delaying gratification but *forgoing it entirely—if there's a stranger nearby who seems to want the snack?

It turns out even a baby will engage in this sort of (イ)altruism, according to a new study conducted by the University of Washington's Institute for Learning and Brain Sciences and published last week in *Scientific Reports*. Altruism, it seems, may well begin in infancy.

Researchers studied how nearly 100 babies, all 19 months old, behaved when presented with sweet fruits like blueberries and grapes. When a researcher pretended to drop a fruit onto a tray and reach for it unsuccessfully, signaling a desire for the snack, 58 percent of the babies picked up the fruit and gave it to the researcher. (When the researcher didn't bother reaching for the fruit, only 4 percent of the babies tried to help out.)

The researchers were also curious about whether the babies would be so generous if they were hungry. After all, part of altruism is helping others even when it means *incurring a personal cost. So the researchers brought in a different sample of infants just before their scheduled snack or mealtime, when they were likely to be hungry, and repeated the experiment.

Even under these conditions, an impressive 37 percent of hungry babies picked up the fruit and offered it to the researchers who pretended to have trouble reaching it.

"The infants in this second study looked longingly at the fruit, and then they gave it away!" said co-author Andrew Meltzoff in a press release. "We think this captures a kind of baby-sized version of altruistic helping."

When we step back and look at behavior from an evolutionary perspective, the fact that we sometimes help perfect strangers—even when it means giving up our own resources or risking

our lives—(ウ)seems to make zero sense. Aren't we supposed to act in a way that maximizes our genes' chance of survival?

Human altruism seems even stranger when we consider it against the backdrop of the animal kingdom. Chimpanzees, our primate cousins with whom we share a recent common ancestor and 98 percent of DNA, do not voluntarily hand over food. Some mammals and birds do share food with their kin, but they don't generally engage in that behavior *unprompted with non-kin or strangers.

So why do we humans?

Philosophers, psychologists, biologists, primatologists, and others have debated this question for centuries. It remains contentious today, with a few dominant hypotheses emerging.

Some evolutionary psychologists argue that we act altruistically to boost our reputation or prove we've got resources to spare, which may help us win an attractive partner with whom we can then reproduce. Others say we do kind things for others in the hopes that they (or the broader culture whose norms we're helping to shape) will *reciprocate one day when we're in need.

Another hypothesis suggests we engage in altruism because it causes us emotional *turmoil to see someone in need and *not* help them; in other words, we're trying to alleviate our own pain, evoked by empathetic impulses.

(エ)What all these explanations have in common is the underlying notion that when we act altruistically, it's not really "pure" altruism—we're getting some long-term benefit out of it, even if we're not consciously aware of it.

But others hypothesize that altruism may not serve an evolutionary purpose now that we live among non-kin in huge groups like nation-states; rather, it's a leftover trait from when we lived in small groups where everyone was genetically close to us. The moral conditioning that we receive—from our parents in particular and our culture in general—may reinforce the belief that we must act altruistically.

The authors of the infant study lean toward that last explanation. "We speculate that certain childrearing practices and values ... convey the expectation to infants that people tend to help

others and may *engender in children a generalized feeling of interpersonal obligation towards other humans in need," they write.

*In tandem with this cultural influence, the authors add, there may be an evolutionary mechanism at work: By giving away food to strangers, an individual might promote *affiliation with another individual as well as broader group *cohesion, ultimately promoting the success of their species.

Both biological and cultural influences (オ) play a role in altruism, but to find out exactly what those influences are and how they interrelate, we need a lot more experimental research.

(出典 "The surprising altruism of babies," by Sigal Samuel, Vox.com. February 20, 2020 © Vox Media, LLC 一部改変)

Notes

contentious: likely to cause disagreement and argument.
gratification: pleasure or satisfaction.
temptation: a strong desire to do something even though you know you should not.
forgo: to give up or do without something pleasant or enjoyable.
incur: to experience something, usually something unpleasant.
unprompted: done without somebody asking you to do it.
reciprocate: to return the favor.
turmoil: a state of confusion or uncertainty.
engender: to make people have a particular feeling.
in tandem with: besides.
affiliation: the relation of being closely associated.
cohesion: the situation when the members of a group are united.

(1) 下線部 (ア) を和訳しなさい。

(2) 下線部 (イ) の altruism とは，どのようなことか。本文中の実験の内容を例にあげながら，日本語で具体的に説明しなさい。

(3) 下線部 (ウ) は，どのような意味か。本文に即して，日本語で簡潔に説明しなさい。

（4） 下線部 (エ) について，これらの説明に共通する点とは何か。本文に即して，日本語で具体的に説明しなさい。

（5） 人間が altruism に従って行動をする理由について，下線部 (オ) の具体的な内容を簡潔に示した1文のはじめの3語を抜き出しなさい。

〔Ⅱ〕 次の文章を読んで，下の問いに解答欄の範囲内で答えなさい。

＊が付いている語句には本文の後ろに注があります。

When I was younger, I believed that everybody thought in photo-realistic pictures the same way I did, with images clicking through my mind a little bit like PowerPoint slides or TikTok videos.

I had no idea that most people are more word-centric than I am. For many, words, not pictures, shape thought. That's probably how our culture got to be so talky: Teachers lecture, religious leaders preach, politicians make speeches and we watch "talking heads" on TV. We call most of these people neurotypical(ア)—they develop along predictable lines and communicate, for the most part, verbally.

I was born in the late 1940s just as the *diagnosis of *autism was being applied to kids like me. I had no language until age 4 and was first diagnosed as brain damaged. Today, many people would say that I'm neurodivergent—a term that encompasses not only autism but also dyslexia, A.D.H.D. and other learning problems. The popularization of the term neurodivergence and society's growing understanding about the different ways that brains work are unquestionably positive developments for many individuals like me.

Still, many aspects of Western society are not set up to allow visual thinkers—which so many of us neurodivergent folks are—to thrive. In fact, many aspects of society seem set up specifically so we will fail. Schools force students into a one-size-fits-all curriculum. The workplace relies too much on *résumés and G.P.A.s to assess candidates' worth. This must change not only because neurodivergent people, and all visual thinkers, deserve better but also because without a major shift in how we think about how we learn, American innovation will be *stifled.

When I was 7 or 8, I spent hours *tinkering and experimenting to figure out how to make parachutes, fashioned from old scarves, open more quickly each time I tossed them into the air. This required careful observation to determine how small design changes affected performance(イ). My single-mindedness, *verging on *obsession, was probably because I was autistic. At the time I loved a book about famous inventors and their inventions. It impressed me that Thomas Edison and the Wright brothers were so single-minded in figuring out how to make a light bulb or an airplane. They spent lots of time obsessively perfecting their inventions. It is likely that some of the inventors in that book also were autistic.

Americans hear a great deal about the need to fix the infrastructure in our country, but we are too focused on the things that need improving and updating rather than the people who will be able to do the work. For over 25 years, I designed equipment to handle *livestock and

worked with the highly skilled people who built the equipment. When I look back at all the projects I designed for large companies, I estimate that 20 percent of the skilled *welders and *drafting technicians were either autistic, dyslexic or had A.D.H.D. I remember two people who had autism and held numerous *patents for mechanical devices they invented and sold equipment to many companies. Our visual thinking skills were key to our success.(ウ)

Today, we want our students to be well-rounded; we should think about making sure that the education we provide is as well. At the same time, I wager that the people who will fix America's infrastructure have spent hours and hours on one thing, whether it be Legos, violin or chess—hyper-focus is a classic sign of neurodivergent thinking and it's critical for innovation and invention.

I often get asked what I would do to improve both elementary and high school. The first step would be to put more of an emphasis on hands-on classes such as art, music, sewing, woodworking, cooking, theater, auto mechanics and welding. I would have hated school if the hands-on classes had been removed, as so many have been today.(エ) These classes also expose students—especially neurodivergent students—to skills that could become a career. Exposure is key. Too many students are growing up who have never used a tool. They are completely removed from the world of the practical.

I am often invited to give talks at corporations and government agencies, and the first thing I tell managers is that they need a neurodiverse work force. Complementary skills are the key to successful teams. We need the people who can build our trains and planes and internet, and the people who can make them run. Studies have shown that diverse teams will *outperform *homogeneous teams. 何も解決しない会議に出席したことがあるだろうか？そうなってしまう理由は，同じような考え方(オ)をする人が多すぎるからかもしれない。

Today, Taiwan produces the majority of the world's highest tech silicon chips. Much of the specialized mechanical equipment used for processing meat is made in Holland and Germany. When I visited the Steve Jobs Theater in California, pre-Covid, I discovered that the glass walls were created by an Italian company. The massive carbon fiber roof that looks like a spaceship was imported from Dubai. The reason this equipment is coming from outside the United States can be traced in part to differences in educational systems.(カ) In Italy and the Netherlands, for instance, a student at about age 14 decides whether to go the university route or the *vocational route. The vocational route is not looked down on or regarded as a lesser form of intelligence. And that's how it should be everywhere, because the skill sets of visual thinkers are essential to finding real-world solutions to society's many problems.

（出典　Temple Grandin: Society Is Failing Visual Thinkers, and That Hurts Us All. (The New York Times, 9 January, 2023) 一部改変）

Notes

diagnosis: the act of discovering or identifying the exact cause of an illness or a problem.

autism: a mental condition in which a person finds it difficult to communicate or form relationships with others.

résumé: a written statement of your educational and work experience.

stifle: to stop something from happening or developing.

tinker: to make small changes to something in order to repair or improve it.

verge on: to be very close or similar to.

obsession: an extreme unhealthy interest in something.

livestock: the animals kept on a farm, for example, cows or sheep.

welder (*n.*) < weld (*v.*): to join pieces of metal together by heating their edges and pressing them together.

draft: to develop and prepare engineering designs and drawings from sketches.

patent: an official right to be the only person to make, use or sell a product or an invention.

outperform: to perform better than.

homogeneous: of the same kind; alike.

vocational: relating to an occupation or employment.

（1）　下線部 (ア) と同じ意味で使われている 1 語を，本文から抜き出しなさい。

（2）　下線部 (イ) について，筆者の体験を日本語で具体的に説明しなさい。

（3）　下線部 (ウ) について，本文中で示されている実例を，日本語で簡潔に説明しなさい。

（4）　下線部 (エ) を和訳しなさい。

（5）　下線部 (オ) を英訳しなさい。

（6）　下線部 (カ) を，本文に即して，日本語で具体的に説明しなさい。