READING PASSAGE 1

You should spend about 20 minutes on **Questions 1-12** which are based on Reading Passage 1 below.

A Second Look at Twin Studies

More than a century after Galton's observation, twin studies remain a favorite tool of behavioral geneticists. Researchers have used twin studies to try to disentangle the environmental and genetic backgrounds of a cornucopia of traits, from aggression to intelligence to schizophrenia to alcohol dependence.

But despite the popularity of twin studies, some psychologists have long questioned assumptions that underline them, like the supposition that fraternal and identical twins share equal environments or that people choose mates with traits unlike their own. The equal environments assumption, for example, has been debated for at least 40 years. Many researchers have found evidence that the assumption is valid, but others remain skeptical.

Overall, twin studies assumptions remain controversial, says psychologist James Jaccard, PhD, a psychologist who studies statistical methods at the University at Albany of the State University of New York. In response, though, researchers are working to expand and develop twin study designs and statistical methods. And while the assumptions question remains a stumbling block for some researchers, many agree twin studies will continue to be an important tool, along with emerging genome and molecular research methods, in shedding light on human behavioral genetics.

The classical twin study design relies on studying twins raised in the same family environments. Monozygotic (identical) twins share all of their genes, while dizygotic (fraternal) twins share only about 50 percent of them. So, if a researcher compares the similarity between sets of identical twins to the similarity between sets of fraternal twins for a particular trait, then any excess likeness between the identical twins should be due to genes rather than environment.

Researchers use this method, and variations on it, to estimate the heritability of traits: The percentage of variance in a population due to genes. Modern twin studies also try to quantify the effect of a person's shared environment (family) and unique environment (the individual events that shape a life) on a trait. The assumptions those studies rest on, questioned by some psychologists, including, in recent work.

Random mating. Twin researchers assume that people are as likely to choose partners who are different from themselves as they are to choose partners who are similar for a particular trait. If, instead, people tend to choose mates like themselves, then fraternal twins could share more than 50 percent of their genes –

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and hence more similarities on genetically influenced traits, because they would receive similar genes from their mothers and fathers.

Equal environments. Twin researchers also assume that fraternal and identical twins raised in the same homes experience equally similar environments. But some research suggests that parents, teachers, peers and others may treat identical twins more similarly than fraternal twins.

Gene-environment interaction. Some researchers think that interaction between genes and environment, rather than genes and environment separately, may influence many traits. A recent study from Science by Avshalom Caspi, PhD, of King's College London, for example, suggests that a gene might moderate propensity for violence, particularly in people who are severely maltreated as children. Many twin study designs don't take this type of complication into account.

Genetic mechanisms. Traits can be inherited through different genetic mechanisms. For traits governed by dominant genetic mechanisms, a dominant gene inherited from one parent trumps a recessive gene inherited from the other parent: If a person inherits a recessive gene for blue eyes from one parent and a dominant gene for brown eyes from the other parent, then the dominant brown gene wins, and the person's eyes are brown.

Additive genetic mechanisms, in contrast, mix together – a plant that receives one red gene and one white gene might, if the genes are additive, turn out pink.

Epistatic mechanisms are complex cases where interactions among multiple genes may determine the outcome of one trait. Twin studies, in general, assume that only one type of genetic mechanism –usually additive –is operating for a particular trait.

Twin researchers acknowledge that these and other limitations exist. But, they say, the limitations don't negate the usefulness of twin studies. For traits that are substantially influenced by heredity, the approximately two-fold difference in genetic similarity between two types of twins should outweigh any complications, says John Hewitt, PhD, director of the Institute for Behavioral Genetics at the University of Colorado at Boulder.

And the extent to which different assumptions matter may depend on which trait is being studied. Studies have suggested, for example, that people are more likely to select mates with similar levels of intelligence than they are mates with similar levels of neuroticism, extraversion and other personality traits. So, researchers who use twins to study intelligence might have to worry more about nonrandom matting than researchers who study personality.

Twin study designs and statistical analysis methods are also constantly evolving and improving. The original twin study design has expanded to include studies of twins' extended families, longitudinal studies and other variations. Some of these variations allow researchers to address previous limitations – they can investigate

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the effects of nonrandom matting, for example, by including the spouses of twins in studies. In fact, says psychologist Dorret Bomsma, PhD, of Vrije University in the Netherlands, all of these assumptions can be tested, given the proper data. She argues that they should not be seen as assumptions at all, but instead as mechanisms whose relevance can be tested using study designs that go beyond the classical twin study design.

Analysis methods, likewise, don't remain static. "People are always thinking about ways to improve the analyses," Hewitt says. Jaccard acknowledges that this is true. "For some designs, we don't have to make as strong assumptions as we used to make," he says. "Instead of having to assume away four constructs, we only have to assume away two or three".

In the age of molecular genetics, meanwhile, the classical twin study design is only one aspect of genetics research. Twin studies estimate the heritability of a trait, but molecular genetics attempts to pinpoint the effects of a particular gene. The future of twin research will involve combining traditional twin studies with molecular genetics research, according to Hewitt, who believes that day is already here. "When we conduct a study of twins these days, we always get DNA on everyone," Hewitt says. "And we'll use that DNA to try and identify specific individual genes that contribute to the overall pattern of heritability".

Questions 1-7

Do the following statements agree with the claims of the writer in Reading Passage 1?

On your answer sheet please write

TRUE if the statement is true

FALSE if the statement is false

NOT GIVEN if the information is not given in the passage..

1 The environmental assumptions for twin studies have been challenged for a long time.

2 Scientists only developed three methods to study human behavioral genetics.

3 Questioning previous on assumptions has made twin studies a useless tool.

4 Identical twins share more similarities than fraternal twins.

5 Because of an addictive genetic mechanism, people will inherit dominant genes from their parents.

6 Numerous genetic elements may join together to determine the result of one trait.

7 Twin studies investigate the effect of a single gene.

Questions 8-12

Complete the summary below.

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Choose your answer from the list below and write them in boxes **8-12** on your answer sheet.

NB *There are more words than spaces so you will not use them all.*

Twin studies are constantly evolving and improving. The classical twin study design is on the basis of studying twins raised in the **8** _____. Modern twin studies try to quantify the effect of a person's family and **9** _____ on a trait. Twin researchers acknowledge that some assumptions and limitations exist and expand the original twin study to include studies of twins' extended families, **10** _____ and other variations. In the time of **11** _____, the classical twin study has its limitation. It does not pinpoint the implication of the particular gene, although it helps to assess individual's **12** _____.

behavioral genetics **environment** **assumptions**
longitudinal studies **unique environment** **acknowledges**
molecular genetics **heritability** **appropriate figures**
restrictions **same family** **identical**
obstacles **accuracies** **distinct**

READING PASSAGE 2

You should spend about 20 minutes on **Questions 13-27** which are based on Reading Passage 2 below.

Torch Relay

A

Fire is a sacred symbol dating back to prehistoric times. In ancient Greece it symbolized the creation of the world, renewal and light. It was also the sacred symbol of Hephaestus, and a gift to the human race from Prometheus, who stole it from Zeus. At the center of every city-state in ancient Greece there was an altar with an ever-burning fire and in every home the sacred Flame burned, dedicated to Hestia, goddess of the family.

B

Torch Relay races started in ancient Greece as religious rituals held at night. Soon they turned into a team athletic event, initially among adolescents, and further developed to become one of the most popular ancient sports. The enchanting power of fire was a source of inspiration. Sacred flames lit by the rays of the sun always burned in Olympia, in an altar dedicated to Hestia. Fire was ignited with the help of a concave mirror, which has the ability to concentrate the rays of the sun on a single spot. When the head priestess touched that point with the Torch, the Flame was lit.

C

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The Ancient Greeks held a "lampadedromia" (the Greek word for Torch Relay), where athletes competed by passing on the Flame in a relay race to the finish line. In ancient Athens the ritual was performed during the Panathenaia fest, held every four years in honor of the goddess Athena. The strength and purity of the sacred Flame was preserved through its transportation by the quickest means; in this case a relay of Torchbearers. The Torch Relay carried the Flame from the altar of Prometheus to the altar of goddess Athena on the Acroppolis. Forty youths from the ten Athenian tribes had to run a distance of 2.5 kilometers in total.

D

For the modern Olympic Games the sacred Flame is lit in Olympia by the head priestess, in the same way as in antiquity, and the ritual includes the athletes' oath. The Flame is then transmitted to the Torch of the first runner and the journey of the Torch Relay begins. The modern Torch Relay is a non-competitive replication of the ancient Flame relay and a symbolic celebration of the Olympic Games. In a prophetic speech at the end of the Stockholm Games, on June 27, 1912, Baron Pierre de Coubertin said: "And now great people have received the Torch and have thereby undertaken to preserve and quicken its precious Flame. Lest or youth temporarily let the Olympic Torch fall from their hands other young people on the other side of the world are prepared to pick it up again".

E

The Torch Relay, as the opening of the Olympic celebration, was received in the Berlin Olympiad in 1936 and since then the Torch Relay has preceded every Olympic Summer Games. Starting from Olympia and carried by the first runner, the young athlete Konstantinos Kondylis, the Flame travelled for the first time hand to hand until it reached the Berlin Olympic Stadium. Since, the Flame's magic has marked and has been identified with the beginning of the Games. In Olympiads that followed, the Torch Relay continued to play an important role, having been enriched with the characteristics and cultures of the host countries. The choice of the athlete who lights the Flame in the Olympic stadium is always symbolic to the host country.

F

For the 1960 Olympic Games in Rome, the Flame followed a route in homage to the Greek and Roman civilizations. It was carried from Piraeus to Rome on the ship 'Americo Vespucci' and passed through some of the best-known or important historical monuments of the two countries. It was the first time that the event was covered by television. In the Mexico Olympiad in 1968, the Flame followed the route taken by Christopher Columbus, and the athletics champion Enriqueta Basilio was the first woman to light the Flame in the Olympic stadium. For the Montreal Games in 1976, the Flame travelled by satellite from Athens to Ottawa, and in the 1992 Games in Barcelona, a Paralympics archery medalist Antonio Rebollo lit the Flame

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in the stadium with burning arrow. In Sydney 2000, the Flame made its journey underwater in the Great Barrier Reef. And the Beijing 2008 Olympic Torch Relay will traverse the longest distance, cover the greatest area and include the largest number of people.

G

The design of the Beijing 2008 Olympic Torch takes advantage of Chinese artistic heritage and technological expertise. The design of the aluminum torch features traditional scrolls and "Lucky Cloud". It stands 72 centimeters high and weighs 985 grams. The Torch incorporates technological innovations to be able to remain lit in winds of up to 65 kilometers-an-hour and lit in rain of up to 50 millimeters-an-hour. And the torch can keep burning for 15 minutes. Other technological advancements prevent color discoloration and corrosion around the cone from which the Flame burns. The Torch construction is also environmentally conscious. The materials are recyclable, and the propane fuel meets environmental requirements. "The Beijing Olympic Torch boasts both distinctive Chinese cultural features, and technical excellence and sophisticated materials. It will carry the friendship that Chinese people extend to the world and the Olympic spirit to the five continents and to the peak of Mt. Qomolangma" said BOCOG President Liu Qi. "The torch and the Olympic Flame are symbols which embody the Olympic Values of excellence, respect and relationship. They inspire us to be the best we can be in all that we do" added IOC President Jacques Rogge. "The magnificent design of the torch for the Beijing 2008 Olympic Torch Relay will also add a very unique Chinese flavor to the relay, as the 'Clouds of Promise' carry the Beijing Games message to the world."

Questions 13-18

Choose the most suitable heading for paragraphs **A-D** and paragraphs **F** and **G** from the list of headings below.

*Write appropriate number (**i-x**) in boxes **13-18** on your answer sheet.*

NB *There are more headings than paragraphs, so you will not use them all.*

List of Headings

i Symbolic meanings of fire
ii How ancient Greeks used fire?
iii The origin of Torch Relay
iv How to light a torch?
v How ancient Greeks performed Torch Relay
vi Selecting right athletes for carrying torches
vii Torch Relay as a mark for modern Olympics
viii Technologies adapted in Torch Relay
ix Different Torch Relay practices in modern Olympics
x Combination of culture and technology

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13 Paragraph **A**
14 Paragraph **B**
15 Paragraph **C**
16 Paragraph **D**
17 Paragraph **F**
18 Paragraph **G**

Questions 19-26

Do the following statements agree with the claims of the writer in Reading Passage 2?

On your answer sheet please write

TRUE if the statement is true

FALSE if the statement is false

NOT GIVEN if the information is not given in the passage.

19 Altars had been built in every ancient Greek city for the Olympics.

20 There were only ten tribes living in Ancient Greece.

21 The ancient and modern Olympic Games obtained the sacred Flame in Olympia in different ways.

22 The Torch Relay was reintroduced at the Berlin Olympic Games during the opening ceremony.

23 The opening ceremony had been suspended temporarily before the Berlin Olympiad.

24 Host countries choose their national symbols to light the Olympic flame.

25 In the Mexico Olympiad in 1968, the Flame was lit by Christopher Columbus.

26 The Beijing 2008 Olympic Torch can keep burning in light rain

Question 27

Choose **NO MORE THAN THREE WORDS** from the passage to answer the question 27.

27 Name three basic Olympic Values mentioned in the passage.

READING PASSAGE 3

You should spend about 20 minutes on **Questions 28-40** which are based on Reading Passage 3 below.

Hurricane

They are essential features of the Earth's atmosphere, as they transfer heat and energy between the equator and the cooler regions towards to poles.

Section A

A hurricane is a large rotating storm centered around an area of very low pressure with strong winds blowing at an average speed in excess of 74 miles per hour. The

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whole storm system may be up to 10 miles high and on average 500 miles wide. It moves forward like an immense spinning top, at speeds up to 20 mph.

Section B

There are various trigger mechanisms required to transform frequent storms into rarer hurricanes. These trigger mechanisms depend on several conditions being 'right' at the same time. One of the most influential factors are sources of very warm, moist air, which derived from tropical oceans with surface temperatures greater than 26°C, and sufficient spin or twist from the rotating earth, which is related to latitude.

As the warm sea heats the air above it, a current of very warm moist air rises up quickly, creating a center of low pressure at the surface. Trade winds rush in towards this low pressure and the inward spiralling winds whirl upwards releasing heat and moisture before descending.

The rotation of the Earth causes the rising column to twist, gradually taking on the form of a cylinder whirling around an eye of relatively still air, free from clouds. The rising air cools and produces towering cumulus and cumulonimbus clouds. Further aloft at 6 miles the cloud tops are carried outwards to give thick layer clouds due to the outward spiralling winds leaving the hurricane core.

Section C

Great amounts of energy are transferred when warm water is evaporated from tropical seas. This energy is stored within the water vapor contained in moist air. As this air ascends, 90% of the stored energy is released by condensation, giving rise to the towering cumulus clouds and rain.

The release of heat energy warms the air locally causing a further decrease in pressure aloft. Consequently, air rises faster to fill this area of low pressure, and more warm moist air is drawn off the sea feeding further energy to the system. Thus a self-sustaining heat engine is created.

Only as little as 3% of the heat energy may be converted mechanical energy of the circulating winds. This relatively small amount of mechanical energy equates to a power supply of 360 billion kilowatt hours per day-or 6 months supply of electrical energy for the whole of the USA!

Section D

Hurricanes form between 5 and 30 latitude and initially move westward (owing to easterly winds) and slightly towards the poles. Many hurricanes eventually drift far enough north or south to move into areas dominated by westerly winds (found in the middle latitudes). These winds tend to reverse the direction of the hurricane to an eastward path.

As the hurricane moves poleward it picks up speed and may reach between 20 and 30 mph. An average hurricane can travel about 300 to 400 miles a day, or about 3000 miles before it dies out. Hurricanes occur between July and October in the

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Atlantic, eastern Pacific and the western Pacific north of the equator. South of the equator, off Australia and in the Indian Ocean, they occur between November and March.
The name hurricane should only be used for those tropical storms occurring in the Atlantic. In the Pacific they are known as typhoons, in the Indian Ocean as cyclones. They are given names beginning with "A", "B" etc. In order of occurrence and the names are alternately male and female.

Section E

These phenomena can cause major destruction, especially when the hurricane's path takes it over land. However a path over land also causes the destruction of the hurricane itself. As it moves over land its energy source is depleted and friction across the land surface distorts the air flow. This leads to the eye filling with cloud and the hurricane dies.

Section F

Other than basic knowledge of general hurricane occurrence there are no atmospheric conditions that can be measured and combined to predict where a hurricane will develop. Therefore we can only forecast its path once formed. A network of instruments, men and equipment at the National Hurricane Center in Miami, Florida search out potential hurricanes in their early stages and track them through their life cycle until they decay and die.
Satellites detect hurricanes in their early stages of development and can help to provide early warning of imminent hurricanes. Reinforced aircraft fitted with instruments fly through and over hurricanes, and weather radar can locate storms within 200 miles of the radar station.
A hurricane warning is issued to coastal areas where winds of 74 mph or greater are definitely expected to occur, or dangerously high water or high waves are predicted. The general public are usually informed via television broadcasts and through a system of flying flags by day and lanterns by night.
More recently, the National Hurricane Center's website has recently been developed to allow people to type in their zip code and get specific information about potential hazards in their area and where to evacuate to if necessary.

Questions 28-31

Use **NO MORE THAN THREE WORDS** from the Section B for each answer.

A current of heated **28** _____ raised up from the warm ocean
A center of **29** _____ created at the surface
Trade winds rush inwards, discharge **30** _____ before descending
The **31** _____ helps the column to twist, taking on the form of a cylinder spinning around an eye of the still air.
The rising air cools and produces towering cumulus and cumulonimbus clouds.

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Question 32-38

Do the following statements agree with the claims of the writer in Reading Passage 3?

On your answer sheet please write

TRUE if the statement is true

FALSE if the statement is false

NOT GIVEN if the information is not given in the passage.

32 Hurricanes often form around the equator.

33 Hurricanes are normally generated above the sea surface under relatively higher temperatures.

34 3% of the mechanical energy generated from hurricanes could power the USA for half a year.

35 Hurricanes, typhoons and cyclones are all the same type of tropical storms.

36 Once the eye of the hurricane eye is filled with moist air, it will die.

37 We are still not capable of anticipating where a hurricane will develop.

38 A system of flying flags and lanterns is used to warn of hurricanes within 200 miles.

Questions 39-40

Choose words from the passage to answer the questions **39-40**, writing **NO MORE THAN THREE WORDS** for each answer.

39 How fast does hurricane normally travel?

40 How broad is a typical hurricane system?

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