

# Boundaries

## Question 1

By studying quantum field theory and applying its principles, Hendrik Casimir made a prediction, proposing a unique force that arises from quantum fluctuations of the vacuum. In 1948 Casimir first described this \_\_\_\_\_ in 1997 it was first precisely measured by researcher Steve K. Lamoreaux.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A Casimir effect,
- B Casimir effect
- C Casimir effect and
- D Casimir effect, and

## Question 2

In 2014, a team of botanists led by Dr. Roxana Yockteng discovered every known genetic marker for horizontal meristems from the last few centuries. With this unique plant sample, the team was able to conclude how tissue-driven growth differs across \_\_\_\_\_ and what effect it has on the development of roots and branches in the plant.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A species,
- B species:
- C species;
- D species

## Question 3

In Epicurean ethics, the ultimate goal is achieving a state of \_\_\_\_\_ state of tranquility, as described by the philosopher Epicurus, is a freedom from distress and worry that constitutes the highest form of pleasure and the ideal mental state for a human being.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A ataraxia. As This
- B ataraxia This
- C ataraxia. This
- D ataraxia, This

## Question 4

For billions of years, Earth has maintained liquid water (H<sub>2</sub>O) on its surface despite the Sun's lower luminosity. When considering early Earth, this presents a paradox \_\_\_\_\_ the Sun was significantly dimmer then, providing too little energy to prevent the planet's oceans from freezing over.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A investigated,
- B investigated:
- C investigated
- D investigated and

## Question 5

Bose-Einstein is a 1924 theory by the Indian physicist Satyendra Nath Bose. Like many of Bose's theories, Bose-Einstein, which describes a state of matter at near absolute zero, attempts to explain the entire quantum mechanical \_\_\_\_\_ using statistical methods, the then-unproven theory details a strange new form of matter.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A phenomenon while
- B phenomenon:
- C phenomenon
- D phenomenon, while

## Question 6

The 2013 study “Acoustic levitation of a large solid sphere” describes one powerful acoustic levitation system in modern-day Switzerland. Researchers have noted the way lead \_\_\_\_\_ details the properties of standing (sound waves that remain in a constant position) and traveling (their conventionally mobile counterparts).

Which choice completes the text so that it conforms to the conventions of Standard English?

- A scientist Dimos Poulikakos
- B scientist, Dimos Poulikakos
- C scientist, Dimos Poulikakos,
- D scientist Dimos Poulikakos,

## Question 7

As a leading figure of the City Beautiful movement, Daniel Burnham, an American architect and urban designer, created comprehensive plans for numerous cities. Burnham didn't just design the \_\_\_\_\_ he also envisioned grand public spaces, influencing the development of modern city planning and civic architecture.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A buildings, though;
- B buildings, though,
- C buildings; though
- D buildings though,

## Question 8

The ice-spewing volcanoes of Enceladus, which eject water vapor and icy particles from deep, linear fractures, have offered planetary scientists evidence for a subsurface \_\_\_\_\_ to planetary scientist Carolyn Porco, who has stated that these jets “are erupting from a salty sea.”

Which choice completes the text so that it conforms to the conventions of Standard English?

- A ocean, according
- B ocean. According
- C ocean according
- D ocean; according

## Question 9

American volcanologist Dorothy Vitaliano coined the term \_\_\_\_\_  
new field studies the links between geology and folklore,  
Vitaliano's work examines how ancient myths may record real  
events, such as volcanic eruptions.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A geomythology and this
- B geomythology. This
- C geomythology this
- D geomythology, this

## Question 10

In 1974, the foundational work of American sociologist Harvey \_\_\_\_\_ was detailed in *A Simplest Systematics*, a seminal text on conversation analysis.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A Sacks;
- B Sacks
- C Sacks,
- D Sacks:

## Question 11

A new theory defines the key elements of psychological flourishing for individuals, communities, and nations to measure well-being. \_\_\_\_\_ proposed that this multifaceted construct of happiness could be scientifically measured and cultivated through specific interventions.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A Psychologist, Martin Seligman,
- B Psychologist Martin Seligman,
- C Psychologist Martin Seligman
- D Psychologist Martin Seligman:

## Question 12

In theater, the concept of the “fourth wall” suggests a separation, the idea of an invisible barrier between the actors on stage and the audience members watching them so intently that it feels almost like an act of voyeurism. When this convention is broken, however, the performance becomes a \_\_\_\_\_ audience directly acknowledged as part of the shared, live event.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A dialogue, the
- B dialogue, and the
- C dialogue. The
- D dialogue; the

## Question 13

In his 2004 book, philosopher Galen Strawson presented a view called realistic \_\_\_\_\_ against the dominant physicalist theories of mind and consciousness, which he felt failed to account for subjective experience, the renowned thinker proposed a form of panpsychism.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A monism and Arguing
- B monism Arguing
- C monism, Arguing
- D monism. Arguing

## Question 14

In a groundbreaking 2020 study, when the structural sand-hydrogel framework was inoculated with the photosynthetic cyanobacteria *Synechococcus* sp. PCC 7002, the result was a novel living building material, its potential so vast, so innovative, and so \_\_\_\_\_ that it has become known as “living concrete.”

Which choice completes the text so that it conforms to the conventions of Standard English?

- A sustainable,
- B sustainable:
- C sustainable;
- D sustainable

## Question 15

First described by Gaspard-Gustave de Coriolis, a prominent French mathematician of his time, the 1835 concept of the Coriolis effect gained wider acceptance in the 1920s when meteorologists realized that the force—which deflects moving objects on a rotating surface—was actually the cause of large-scale atmospheric \_\_\_\_\_ patterns like cyclones (1835).

Which choice completes the text so that it conforms to the conventions of Standard English?

- A circulation
- B circulation—
- C circulation:
- D circulation,

## Question 16

Philosophers studying metaphysics have debated how particular things can share common properties or \_\_\_\_\_ according to Plato's theory of Forms, these universals exist as abstract objects in a separate realm, but Aristotle argued that universals exist within particular things themselves, denying any independent existence for these shared attributes.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A qualities:
- B qualities
- C qualities while
- D qualities,

## Question 17

In a famous essay, Russian-American art historian André Grabar argued that, for the early Italian Renaissance painters (artists like Giotto di Bondone or the great Duccio di Buoninsegna) who were breaking from medieval traditions, there was one artistic source that they drew particularly \_\_\_\_\_ Byzantine iconography.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A heavily from.
- B heavily from:
- C heavily from;
- D heavily from

## Question 18

The French economist Maurice Allais worked with his equipment to observe the Allais effect—a controversial and anomalous pendulum \_\_\_\_\_ anomalous precession from his Foucault pendulum during the 1954 solar eclipse, the researcher recorded this deviation despite, in the view of conventional physics, it lacking a clear explanation.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A behavior, noticing
- B behavior. Noticing
- C behavior noticing
- D behavior—noticing

## Question 19

Social psychology has identified dozens, if not hundreds, of cognitive biases. Only one of these biases is the tendency to assume others share our \_\_\_\_\_ the projection bias, a term coined by Loewenstein, O'Donoghue, and Rabin—the last of whom helped to develop the concept within behavioral economics.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A preferences, however;
- B preferences, however:
- C preferences; however,
- D preferences, however,

## Question 20

Planetary scientist Pascal Lee, who studied at Cornell University, has proposed that lava tubes on the Moon and Mars could serve as natural habitats, shelters, and \_\_\_\_\_ subterranean caverns offer protection from the harsh surface environment, a concept supported by researcher Anshool Sood.

Which choice completes the text so that it conforms to the conventions of Standard English?

- A bases, these
- B bases and these
- C bases these
- D bases. These

# Answers

## Question 1

**Correct Answer: D**

Look at the clauses on both sides of the blank:

- 'In 1948 Casimir first described this \_\_\_\_\_'
- 'in 1997 it was first precisely measured by researcher Steve K. Lamoreaux.'

Both clauses are **independent clauses** because they each contain a subject and a verb and can stand alone as complete sentences.

In the SAT, to separate two independent clauses, we have to use either a **semicolon**, a **period**, or a **comma + FANBOYS** (For, And, Nor, But, Or, Yet, So). Looking at the answer choices, we see that option (D) provides "comma + and," which follows this rule since "and" is one of the FANBOYS coordinating conjunctions.

Therefore, **(D)** is the correct answer.

*Note: Option (A) creates a comma splice error by using only a comma to separate two independent clauses. Option (C) uses "and" without a comma, which is incorrect when connecting two independent clauses.*

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## Question 2

**Correct Answer: D**

Look at the clauses on both sides of the blank:

- "With this unique plant sample, the team was able to conclude how tissue-driven growth differs across species"
- "and what effect it has on the development of roots and branches in the plant"

The second clause begins with "and," which connects it to the first clause as part of a compound structure. Specifically, "how tissue-driven growth differs across species" and "what effect it has on the development of roots and branches" are both objects of the verb "conclude."

In the SAT, when two items are connected by "and" to form a compound structure, **no punctuation should separate them**. The word "and" itself provides the necessary connection between the two parallel elements.

Therefore, **(D) species** is the correct answer because no punctuation is needed before "and" when it connects compound elements within the same sentence structure.

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## Question 3

**Correct Answer: C**

Look at the clauses on both sides of the blank:

- 'In Epicurean ethics, the ultimate goal is achieving a state of ataraxia'
- 'This state of tranquility, as described by the philosopher Epicurus, is a freedom from distress and worry that constitutes the highest form of pleasure and the ideal mental state for a human being'

The first clause is an independent clause because it contains a subject ("the ultimate goal") and a predicate ("is achieving a state of ataraxia") and can stand alone as a complete sentence.

The second clause is also an independent clause because it has a subject ("This state of tranquility") and a predicate ("is a freedom from distress and worry") and can stand alone as a complete sentence.

In the SAT, to separate two independent clauses, we have to use a period or semicolon. Since only a period appears in the answer choices, we need choice **(C)**.

Therefore, **(C) ataraxia. This** is the correct answer.

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## Question 4

**Correct Answer: B**

Look at the clauses on both sides of the blank:

- "When considering early Earth, this presents a paradox investigated"
- "the Sun was significantly dimmer then, providing too little energy to prevent the planet's oceans from freezing over"

The first clause is an independent clause with the subject "this" and the predicate "presents a paradox investigated." The second clause is also an independent clause with the subject "the Sun" and the predicate "was significantly dimmer then."

In the SAT, to separate two independent clauses where the second clause explains or elaborates on the first, we can use a **colon** or a **dash**. In this case, the second clause explains what the paradox is—specifically, that the Sun was dimmer but Earth still had liquid water.

A colon is appropriate here because the first clause is a complete sentence that introduces what follows: the explanation of the paradox.

Therefore, **(B) investigated:** is the correct answer.

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## Question 5

**Correct Answer: B**

Look at the clauses on both sides of the blank:

- "Bose-Einstein, which describes a state of matter at near absolute zero, attempts to explain the entire quantum mechanical phenomenon"
- "the then-unproven theory details a strange new form of matter"

The first clause is an independent clause (it has a subject "Bose-Einstein" and a complete predicate "attempts to explain"). The second clause is also an independent clause (it has a subject "the then-unproven theory" and a

complete predicate "details a strange new form of matter").

In the SAT, to separate two independent clauses, we can use a semicolon, a period, or a colon. Looking at the answer choices, only the colon appears as an option.

The colon is particularly appropriate here because the second clause provides a specific explanation of what the theory does—it introduces details about the "strange new form of matter" that the theory describes.

Therefore, **(B) phenomenon:** is the correct answer.

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## Question 6

**Correct Answer: A**

This question tests the punctuation rule for names and titles.

The relevant rule is: when a title (like "scientist") comes before a name, we need to determine if the information is essential or non-essential. If the name is essential (meaning we need it to identify which specific person we're talking about), we use no commas. If the name is non-essential (meaning the title alone is sufficient), we use two commas to set it off.

To test this, we can try removing the name "Dimos Poulidakos" from the sentence. If we read "Researchers have noted the way lead scientist details the properties...", the sentence becomes unclear—we don't know *which* lead scientist is being discussed. This tells us the name is essential information that identifies the specific scientist, so no commas should be used.

Therefore, **(A)** is the correct answer because it treats the name as essential information and correctly uses no punctuation between "scientist" and "Dimos Poulidakos."

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## Question 7

**Correct Answer: A**

Look at the clauses on both sides of the blank:

- 'Burnham didn't just design the buildings, though'
- 'he also envisioned grand public spaces'

The first clause is **independent**—it contains a subject ("Burnham") and a predicate ("didn't just design") and expresses a complete thought. The second clause is also **independent**—it has a subject ("he") and a predicate ("envisioned") and can stand alone.

In the SAT, to separate two independent clauses, we must use either a **semicolon** or a **comma + FANBOYS** (for, and, nor, but, or, yet, so). However, "though" is **not** a FANBOYS conjunction—it's a transition word that belongs to the first clause as an aside comment.

Since "though" is part of the first independent clause and functions as non-essential information at the end, it should be set off with a comma before it. Then, because we're connecting two independent clauses, we need a semicolon after "though" to properly separate them.

Therefore, **(A)** is the correct answer.

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## Question 8

**Correct Answer: A**

Look at the clauses on both sides of the blank:

- "The ice-spewing volcanoes of Enceladus, which eject water vapor and icy particles from deep, linear fractures, have offered planetary scientists evidence for a subsurface ocean"
- "according to planetary scientist Carolyn Porco, who has stated that these jets 'are erupting from a salty sea.'"

The first clause is an **independent clause**—it contains a subject ("The ice-spewing volcanoes") and a complete predicate and can stand alone as a sentence.

The second clause begins with "according to," which is a **prepositional phrase**. This makes it a **dependent clause** that cannot stand alone and must be attached to the independent clause.

In the SAT, when attaching a dependent clause that begins with a prepositional phrase to an independent clause, we use a **comma**. Periods, semicolons, and no punctuation are not appropriate here because the dependent clause must remain connected to the main sentence.

Therefore, **(A)** is the correct answer.

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## Question 9

**Correct Answer: B**

Look at the clauses on both sides of the blank:

- "American volcanologist Dorothy Vitaliano coined the term geomythology"
- "this new field studies the links between geology and folklore"

The first clause is an independent clause—it has a subject ("American volcanologist Dorothy Vitaliano") and a complete verb ("coined"), making it a complete sentence that can stand alone.

The second clause is also an independent clause—it has a subject ("this new field") and a complete verb ("studies"), making it another complete sentence that can stand alone.

In the SAT, to separate two independent clauses, we have to use a **period** or **semicolon**. Looking at the answer choices, only (B) provides a period between these two independent clauses.

Therefore, **(B) geomythology. This** is the correct answer.

*Note: (D) creates a comma splice error by attempting to connect two*

*independent clauses with only a comma and a pronoun. Remember that comma + pronoun (without FANBOYS) cannot separate two independent clauses.*

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## Question 10

**Correct Answer: B**

Look at the clauses on both sides of the blank:

- 'In 1974, the foundational work of American sociologist Harvey Sacks'
- 'was detailed in A Simplest Systematics, a seminal text on conversation analysis.'

The first part is not an independent clause because it lacks a verb for the subject "work." The second part contains the verb "was detailed" that completes the sentence. Together, they form one continuous independent clause with the structure: "the foundational work...was detailed in A Simplest Systematics."

Since "Harvey Sacks" is simply the name completing the phrase "American sociologist Harvey Sacks," and the sentence continues without interruption, no punctuation is needed after the name. The name is an essential part of identifying which sociologist's work is being discussed.

Therefore, **(B)** is the correct answer.

*Note: Be careful not to treat this as a clause separation issue. The key is recognizing that "Harvey Sacks" is an essential identifier within a single sentence structure, requiring no punctuation.*

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## Question 11

**Correct Answer: C**

This question tests the punctuation rule for names and titles.

The relevant rule is: when a title precedes a name, use either no commas (if the information is essential) or two commas (if the information is non-essential). The key test is whether you can remove the name and the sentence still makes complete sense.

Let's apply this test: If we remove "Martin Seligman" from the sentence, we get "Psychologist proposed that this multifaceted construct..." This sentence is incomplete and unclear—we need to know *which* psychologist proposed this theory.

Since the name is essential to identify the specific person, we should use **no commas** around it.

Looking at what comes after the name, we see "proposed that..." which is a verb starting a new clause. Since we're connecting the subject "Psychologist Martin Seligman" to its verb "proposed," we don't need any punctuation between them.

Therefore, **(C) Psychologist Martin Seligman** is the correct answer because it correctly uses no commas around the essential identifying information and no punctuation before the verb.

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## Question 12

**Correct Answer: A**

Look at the clauses on both sides of the blank:

- "When this convention is broken, however, the performance becomes a dialogue"
- "the audience directly acknowledged as part of the shared, live event"

The first clause is an independent clause—it contains a subject ("the performance") and a complete verb ("becomes") and expresses a complete thought.

The second clause is a dependent clause. It lacks a main verb and cannot stand alone as a complete sentence. The phrase "audience directly

acknowledged" is a noun phrase with a past participle modifier, not an independent clause.

In the SAT, to separate an independent clause and a dependent clause that provides additional description, we need to use either a comma or no punctuation at all. Since the dependent clause here is non-essential information (an appositive phrase that renames "dialogue"), we use a comma.

Additionally, this sentence does not require a coordinating conjunction like "and" because the second part is not an independent clause that needs to be connected to the first.

Therefore, **(A)** is the correct answer.

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## Question 13

**Correct Answer: D**

Look at the clauses on both sides of the blank:

- "In his 2004 book, philosopher Galen Strawson presented a view called realistic monism"
- "Arguing against the dominant physicalist theories of mind and consciousness, which he felt failed to account for subjective experience, the renowned thinker proposed a form of panpsychism"

The first clause is an **independent clause** because it contains a subject ("philosopher Galen Strawson") and a complete predicate ("presented a view called realistic monism"), making it a complete sentence that can stand alone.

The second clause is also an **independent clause**. Although it begins with "Arguing," this is a participial phrase that modifies "the renowned thinker." The core of this clause is "the renowned thinker proposed a form of panpsychism," which is a complete sentence with its own subject and predicate.

In the SAT, to separate two independent clauses, we have to use a **period or semicolon**. Since only a period appears in the answer choices, that is what we need.

Therefore, **(D) monism. Arguing** is the correct answer.

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## Question 14

**Correct Answer: D**

Look at the clauses on both sides of the blank:

- "when the structural sand-hydrogel framework was inoculated with the photosynthetic cyanobacteria *Synechococcus* sp. PCC 7002, the result was a novel living building material, its potential so vast, so innovative, and so \_\_\_\_\_"

- "that it has become known as 'living concrete.'"

The first clause is an independent clause (it can stand alone as a complete sentence). The second clause beginning with "that" is a dependent clause (it cannot stand alone).

**In the SAT, to separate an independent clause and a dependent clause, we cannot use a semicolon or colon. We can only use a comma or no punctuation at all.**

However, this question also tests items in a list. The phrase "so vast, so innovative, and so \_\_\_\_\_" is a list of three parallel items describing the potential. In a list like this, items are separated by commas, and the word "and" connects the final item without requiring additional punctuation after it.

Therefore, **(D)** is the correct answer because no punctuation is needed after "sustainable" in this parallel list structure.

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## Question 15

**Correct Answer: A**

Look at the clauses on both sides of the blank:

- 'the force—which deflects moving objects on a rotating surface—was actually the cause of large-scale atmospheric [blank] patterns like cyclones'

This is one independent clause. The word that comes after the blank, "patterns," is not starting a new clause—it's simply continuing the noun phrase "atmospheric [blank] patterns."

The phrase "like cyclones" at the end provides examples of the patterns being discussed. This is not a separate clause that needs to be separated by punctuation; it's an integral part of the same sentence.

Since we're simply completing a noun phrase within a single clause, we need no punctuation after "circulation." The word "patterns" must directly follow "circulation" to form the complete phrase "atmospheric circulation patterns."

Therefore, **(A)** is the correct answer.

*Note: Options (B), (C), and (D) would incorrectly separate "circulation" from "patterns," breaking up a noun phrase that should remain together. Dashes, colons, and commas are used to separate clauses or introduce additional information, but here we're in the middle of describing a single concept.*

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## Question 16

**Correct Answer: A**

Look at the clauses on both sides of the blank:

- 'Philosophers studying metaphysics have debated how particular things can share common properties or qualities'

- 'according to Plato's theory of Forms, these universals exist as abstract objects in a separate realm'

The first clause is an independent clause—it contains a subject ('Philosophers studying metaphysics') and a complete predicate ('have debated how particular things can share common properties or qualities'), making it a complete sentence that can stand alone.

The second clause is also an independent clause—it has a subject ('these universals') and a predicate ('exist as abstract objects in a separate realm'), and the introductory phrase 'according to Plato's theory of Forms' is just additional information that doesn't make the clause dependent.

In the SAT, to separate two independent clauses, we have to use a period, semicolon, or colon. Since the second clause provides an explanation or example of the philosophical debate mentioned in the first clause, a colon is particularly appropriate here because it introduces this elaboration.

Therefore, **(A) qualities:** is the correct answer.

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## Question 17

**Correct Answer: B**

Look at the clauses on both sides of the blank:

- "there was one artistic source that they drew particularly heavily from"
- "Byzantine iconography"

The first clause is an independent clause (a complete sentence). The second clause "Byzantine iconography" is just a noun phrase, not even a clause at all—it lacks both a subject and a verb.

In the SAT, when we need to introduce an explanation or specify what something is, we use a **colon** or **dash**. These punctuation marks signal that what follows will clarify or identify what was just mentioned. Here, "Byzantine iconography" identifies which "artistic source" the painters drew from.

The key rule is that a colon must follow a complete sentence that logically sets up what comes after it. The sentence before the blank states there was

"one artistic source"—and the colon then reveals what that source was.

Therefore, **(B) heavily from:** is the correct answer.

**Important note:** Don't be confused by the preposition "from" appearing right before the colon. While commas typically shouldn't come directly after prepositions, colons can follow prepositions when introducing explanatory information.

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## Question 18

**Correct Answer: B**

Look at the clauses on both sides of the blank:

- "The French economist Maurice Allais worked with his equipment to observe the Allais effect—a controversial and anomalous pendulum behavior"
- "Noticing anomalous precession from his Foucault pendulum during the 1954 solar eclipse, the researcher recorded this deviation despite, in the view of conventional physics, it lacking a clear explanation"

The first clause is an **independent clause** because it contains a subject ("Maurice Allais") and a complete predicate ("worked with his equipment to observe the Allais effect"). The dash and the phrase following it provide non-essential information describing "the Allais effect," but the main clause is complete.

The second clause is also an **independent clause**. While it begins with "Noticing," which is a participial phrase, the main clause "the researcher recorded this deviation" is independent, with "the researcher" as the subject and "recorded" as the verb.

In the SAT, to separate two independent clauses, we must use a **period or semicolon**. Among the answer choices, only (B) uses a period.

Therefore, **(B) behavior. Noticing** is the correct answer.

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## Question 19

**Correct Answer: B**

Look at the clauses on both sides of the blank:

- 'Only one of these biases is the tendency to assume others share our preferences, however'
- 'the projection bias, a term coined by Loewenstein, O'Donoghue, and Rabin—the last of whom helped to develop the concept within behavioral economics.'

The first clause is an independent clause (complete sentence). The second clause is a dependent clause—specifically, it's an appositive phrase that renames "the projection bias." The word "however" is a transition that belongs to the first clause, appearing at its end to indicate contrast.

In the SAT, to introduce an explanation or restatement (which is what the appositive does here), we use either a colon or a dash. Since all answer choices include "however," we need punctuation that both ends the first clause with the transition and introduces the explanatory appositive.

The correct punctuation pattern is: **comma + however + colon**. The comma before "however" is needed because "however" is a transitional word at the end of a clause. The colon after "however" introduces the explanatory appositive that follows.

Therefore, **(B) preferences, however:** is the correct answer.

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## Question 20

**Correct Answer: D**

Look at the clauses on both sides of the blank:

- 'Planetary scientist Pascal Lee, who studied at Cornell University, has proposed that lava tubes on the Moon and Mars could serve as natural

habitats, shelters, and bases'

- 'these subterranean caverns offer protection from the harsh surface environment'

The first clause is an independent clause—it contains a subject (Pascal Lee) and a complete predicate, forming a sentence that can stand alone. The second clause is also an independent clause, with "these subterranean caverns" as the subject and "offer protection" as the predicate.

In the SAT, to separate two independent clauses, we must use a **period** or a **semicolon**. Since only a period appears in the answer choices, that is what we need here.

Therefore, **(D) bases. These** is the correct answer.

Note that options (A) and (C) create comma splices, which occur when two independent clauses are joined by only a comma or no punctuation at all. Option (B) incorrectly uses "and" without proper punctuation to separate the independent clauses, as "and" here would be connecting items in the list (habitats, shelters, and bases) rather than joining the two complete sentences.