

FALSE CAUSE

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FALSE CAUSE (Causal Fallacy)

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1. Core Definition and Nature of the Fallacy

The **False Cause** fallacy, known formally in Latin as *non causa pro causa* ("not the cause for the cause"), is a broad category of informal logical fallacy characterized by the mistaken assumption that a relationship between two events implies that one event caused the other. The essential error lies in confusing mere association--whether temporal sequence or simultaneous correlation--with genuine causal necessity. While a temporal sequence is a necessary condition for causation (the cause must precede the effect), it is far from a sufficient condition. This fallacy permeates everyday reasoning, often driven by the human tendency to seek simple explanations and narratives for complex phenomena, leading individuals to attribute causality based on insufficient evidence or the oversight of alternative explanations, such as external confounding variables or simply coincidence. Consequently, the conclusion that A causes B, while logically possible, is not supported by the premises which only establish the proximity or co-occurrence of A and B.

The term **causal ordering**, mentioned in the source material, refers precisely to the critical necessity of establishing the correct direction of influence. The False Cause fallacy often violates this ordering, either by reversing the true cause-effect relationship (reverse causality) or by assuming a linear, direct relationship when, in reality, both events are effects stemming from a third, unacknowledged factor. A crucial distinction must always be maintained between **correlation** and **causation**. Correlation measures the degree to which two variables change together; causation implies that a change in one variable is directly responsible for, or influences, the change in the other. When a claim of causation is made solely on the basis of observed correlation, the argument is logically flawed and falls under the umbrella of the False Cause fallacy, unless rigorous methodological standards are applied to rule out alternative explanations.

The persuasive power of the False Cause fallacy stems from its psychological resonance. Humans are evolutionarily predisposed to detect patterns and infer causality rapidly, as this mechanism is vital for learning and survival. However, this efficient cognitive shortcut often leads to logical errors when applied to complex systems or statistical data. In academic and scientific contexts, recognizing and avoiding the False Cause is paramount, as failure to do so can lead to fundamentally incorrect conclusions about natural, social, or psychological phenomena. Therefore, any hypothesis claiming causality must be subjected to rigorous testing, demanding not just observation of sequence or correlation, but isolation of variables and control for external influences, typically through experimental designs like randomized controlled trials.

2. Etymology and Classification within Informal Fallacies

The systematic study of fallacies dates back to the ancient Greek philosopher, Aristotle, whose work in the *Organon*, particularly the treatise *Sophistical Refutations*, categorized errors in reasoning. The Causal Fallacy, in its various forms, falls squarely within the tradition of informal or material fallacies. Informal fallacies are errors that occur in the content or context of an argument's premises, rather than errors in the formal structure of the logic itself. Unlike formal fallacies (where the conclusion doesn't logically follow from the premises due to an invalid structure), the premises in a causal fallacy might seem intuitively plausible, but they fail to provide sufficient evidential grounds to warrant the causal conclusion being drawn, relying instead on insufficient induction or unwarranted assumptions.

Within the taxonomy of informal fallacies, the False Cause is often grouped with fallacies of insufficient evidence or weak induction. The primary mechanism of error involves overlooking crucial information, specifically the lack of a demonstrated causal mechanism or the presence of an uncontrolled confounding variable. The most widely recognized subtype, *Post hoc ergo propter hoc* ("after this, therefore because of this"), has historical roots tied deeply to superstitious thinking and folk wisdom. Whenever a person performs an action (A) and a positive outcome (B) immediately follows, the human mind tends to solidify the causal link between A and B, even if the connection is purely coincidental. Philosophically, the challenge posed by David Hume regarding the impossibility of observing a necessary connection between cause and effect further illuminates the fragility of causal claims based purely on observation or sequence.

While the term *non causa pro causa* serves as the general umbrella for all arguments that assume a false cause, it is important to delineate the specific manifestations. Logical theorists classify these errors based on *how* the causal evidence is misused. These classifications include mistaking a necessary condition for a sufficient one, confusing cause with effect, or mistaking the effect of a third variable for a direct link between the two observed variables. The persistence of these varied causal errors underscores the difficulty inherent in establishing true causality, necessitating disciplined reasoning and the rigorous application of the scientific method to differentiate actual causal chains from mere spurious correlations.

3. Key Subtypes of False Cause Fallacies

The False Cause umbrella covers several distinct errors in causal reasoning, each defined by the nature of the flawed relationship asserted. Understanding these subtypes is essential for identifying and critiquing weak inductive arguments. The most notorious subtype is **Post Hoc Ergo Propter Hoc** (often simply "post hoc"), which asserts causality based purely on temporal succession. The structure is simple: Event B occurred after Event A; therefore, A must have caused B. This is the fallacy most commonly associated with superstitious behavior. For example, a sports team wears a

specific jersey (A) and then wins a game (B). The argument concludes that the jersey caused the win. This fails to acknowledge that A and B are merely correlated by sequence, and that the outcome B was almost certainly determined by complex, external factors unrelated to A.

Another major subtype is **Cum Hoc Ergo Propter Hoc** ("with this, therefore because of this"), which asserts causality based on simultaneous correlation or association, neglecting the possibility of a common cause or coincidence. Unlike post hoc, cum hoc deals with events occurring concurrently. The primary danger of the cum hoc fallacy is overlooking a **confounding variable**. A famous statistical example is the strong correlation observed between ice cream consumption and the rate of drowning incidents. The fallacy would conclude that buying ice cream causes people to drown. The proper causal analysis, however, identifies a third variable--summer heat--which simultaneously increases both ice cream sales and the frequency of swimming (and thus drowning incidents). In this case, the relationship between ice cream and drowning is entirely spurious, both being effects of the common cause.

Finally, the source content specifically highlights **Reverse Causality**, an error where the direction of the causal link is inverted. If A actually causes B, the reverse causality fallacy concludes that B causes A. This error is common in the interpretation of observational sociological and psychological data. For instance, studies might show a strong positive correlation between happiness levels (A) and having strong social networks (B). A reverse causality argument might claim that possessing strong social networks causes a person to become happy. While plausible, empirical evidence often suggests that the causal ordering is reversed: happier individuals are more proactive in building and maintaining social relationships, meaning A (happiness) leads to B (social networks). Failing to properly determine the direction of influence severely compromises the validity of any resulting conclusion or policy recommendation based on that causal claim.

4. Cognitive Mechanisms and Psychological Drivers

The pervasive nature of the False Cause fallacy is rooted deeply in fundamental human cognitive processes. The brain is an efficient pattern-recognition machine, constantly seeking regularities and connections in sensory input to construct a predictable model of the world. This inherent drive for cognitive efficiency leads to the employment of **heuristics**--mental shortcuts--which, while generally useful for rapid decision-making, can systematically introduce logical biases. The tendency to infer causality from mere association is one such shortcut, often amplified by phenomena like apophenia, the experience of seeing meaningful patterns or connections in random or meaningless data. When two events happen close together, the brain, seeking to establish explanatory closure, naturally favors the simplest explanation: that they are linked by cause and effect, even without an established mechanism.

Furthermore, psychological factors such as **Confirmation Bias** significantly contribute to the

maintenance of causal fallacies. Once an individual hypothesizes a causal link (e.g., "my lucky shirt helps me pass tests"), they selectively seek out, interpret, and remember instances that support this belief, while simultaneously ignoring or discounting instances where the shirt was worn and the test was failed. This selective processing reinforces the initial, flawed causal assumption, making the belief highly resistant to rational counter-evidence. This bias is particularly potent in areas involving personal success, health outcomes, or deeply held political beliefs, where emotional investment overrides critical, objective evaluation of evidence. The emotional satisfaction derived from having a simple explanation--even a false one--often outweighs the discomfort of acknowledging uncertainty or complexity.

The interplay of these mechanisms explains why superstitions and folk remedies are so enduring. The initial coincidence triggers the Post Hoc error, and confirmation bias sustains the belief over time. In a societal context, this leads to the widespread acceptance of anecdotal evidence over statistical data, a phenomenon sometimes referred to as the **Narrative Fallacy**. People often prefer a compelling, simple story that suggests a direct cause (e.g., "Policy X fixed the economy") over a complex statistical analysis that attributes outcomes to multiple, interacting variables. Recognizing these psychological drivers is critical, as correcting a causal fallacy requires not only logical training but also an awareness of the biases that make such fallacies appealing in the first place.

5. Implications in Scientific Inquiry and Statistical Analysis

In the realms of scientific research, especially social science, epidemiology, and public health, the Causal Fallacy represents a central methodological challenge. The ultimate goal of scientific inquiry is often to establish robust causal relationships to predict and control phenomena. However, much of scientific data is observational--researchers can only record what happens, not manipulate the variables--making the risk of committing a causal fallacy extremely high. For instance, epidemiological studies frequently observe correlations between lifestyle factors (A) and disease outcomes (B). Concluding that A causes B without controlling for all possible **confounding variables** (C, D, E...) is a classic False Cause error.

To move beyond mere correlation, scientists rely on stringent methodological protocols. The gold standard for establishing causality remains the **Randomized Controlled Trial (RCT)**. In an RCT, participants are randomly assigned to a treatment group (exposed to A) or a control group (not exposed to A). Randomization ensures that all unknown confounding variables are theoretically distributed equally between the two groups, thereby isolating the effect of A. If a statistically significant difference in outcome B is observed, the causal claim is strongly supported. When RCTs are impossible (due to ethical or practical constraints), researchers must employ sophisticated statistical techniques, such as regression analysis and propensity score matching, to model and statistically control for known confounding factors, though the resulting causal claim is

inherently weaker than one derived from a true experiment.

Furthermore, scientists utilize criteria, such as the Bradford Hill criteria, to assess the likelihood that an observed correlation reflects true causation. These criteria demand more than temporal sequence; they require consideration of the strength of the association, consistency across multiple studies, biological plausibility, and a dose-response relationship. If a strong correlation is identified, but a plausible mechanism linking the proposed cause and effect cannot be established (i.e., biological plausibility is low), the scientific community treats the causal claim with skepticism, recognizing the high probability that the observation is a False Cause error driven by either coincidence or an unidentified confounder.

6. Real-World Manifestations and Examples

The False Cause fallacy manifests widely in public discourse, policy debates, and everyday decision-making. In politics, it is a common rhetorical tool. For example, a politician might claim that since crime rates fell six months after a specific policy (A) was enacted, Policy A was the cause of the reduction (B). This is a textbook *post hoc* argument that neglects dozens of potential factors that influence crime rates, such as economic changes, demographic shifts, or unrelated policing initiatives that may have occurred simultaneously. Utilizing this fallacy allows proponents to claim credit for positive outcomes that may have occurred independently of their actions.

In the realm of personal belief and health, causal fallacies drive many misconceptions. The rise in popularity of unproven alternative medicine often hinges on anecdotal evidence that relies heavily on *post hoc* reasoning. A patient might start a new diet (A) and subsequently experience remission of symptoms (B). The patient concludes A caused B, ignoring the possibility of spontaneous remission, the placebo effect, or the influence of other lifestyle changes made concurrently. This type of reasoning, while psychologically comforting for the individual, can lead to the rejection of evidence-based medical treatments in favor of ineffective or even harmful practices.

The False Cause fallacy is also responsible for many deeply entrenched societal superstitions. Belief in astrology, carrying a "lucky charm," or avoiding certain actions on specific days are all reinforced by occasional, random positive outcomes that follow the behavior. These coincidences are then incorrectly interpreted as evidence of a genuine causal power. The danger here is that reliance on non-causal actions can distract resources, time, and attention away from identifying and addressing the real causes of problems, whether they are related to personal performance, health, or societal governance.

7. Philosophical Foundations of Causality

The difficulty in avoiding the False Cause fallacy ultimately reflects the profound philosophical challenge inherent in defining and proving causation itself. Western philosophy, particularly since

the Enlightenment, has wrestled with the nature of causal necessity. The empiricist philosopher David Hume famously argued that we never actually observe causation; we only observe constant conjunction--event A is always followed by event B. Our belief in necessity is, according to Hume, merely a psychological expectation derived from habit, not a logical or empirical certainty. This skeptical view provides a rigorous philosophical foundation for understanding why the human mind so easily defaults to assuming causality from mere association.

Modern philosophical analysis often differentiates between ****necessary conditions**** and ****sufficient conditions****. A necessary condition (N) is one that must be present for the effect (E) to occur (E cannot happen without N). A sufficient condition (S) is one that, if present, guarantees the effect (S causes E to happen). The False Cause fallacy frequently confuses these two concepts, mistaking a necessary condition for a sufficient one, or assuming an event that is neither necessary nor sufficient is the sole cause. For instance, being over 18 is a necessary condition to vote, but not a sufficient one (one must also register). Asserting that merely turning 18 causes voting behavior would be a causal fallacy.

Ultimately, identifying a False Cause fallacy requires a disciplined commitment to methodological rigor and logical skepticism. It demands that the arguer provide evidence not just of correlation or temporal proximity, but of an established, non-spurious mechanism linking the proposed cause and effect, while systematically excluding alternative explanations, especially the presence of a common underlying factor. The recognition of the False Cause is thus a fundamental cornerstone of critical thinking, ensuring that conclusions drawn about the world are based on genuine causal structure rather than accidental association.

8. Further Reading

[Causal fallacy \(Wikipedia\)](#)

[Informal Fallacies \(Internet Encyclopedia of Philosophy\)](#)

[Fallacies of Inductive Reasoning \(Stanford Encyclopedia of Philosophy\)](#)

[Correlation does not imply causation \(Wikipedia\)](#)