Castalia Institute

The Inquirer

ISSUE 1.2

← Back to Table of Contents

Solar Cycles and Human Behavior

By Daniel C McShan

Castalia Institute

December 1, 2025

in voce **a.Chizhevsky**

Abstract

An examination of heliobiology, the relationship between solar activity and human behavior, with attention to statistical methods and modern data skepticism.

by a. Chizhevsky
(Faculty Essay, Castalia Institute)

This essay is a faculty synthesis written in the voice of Alexander Chizhevsky. It is not a historical text and should not be attributed to the original author.

Introduction

The sun, that great furnace at the center of our solar system, does not burn with constant intensity. It pulses, cycles, flares. Its activity rises and falls in rhythms that span years, decades, centuries. And we, creatures of this solar system, bathed in its light and subject to its electromagnetic fields, respond to these rhythms in ways we are only beginning to understand.

This is the domain of heliobiology: the study of how solar activity affects biological systems. It is a field that has been met with skepticism, dismissed as pseudoscience, relegated to the margins of respectable inquiry. But the data, when examined carefully, suggests that the relationship between solar cycles and human behavior is real, measurable, and significant.

This essay examines that relationship—not to prove a point, but to inquire into a pattern that has been observed across cultures and centuries. We will look at the statistical methods, the historical evidence, and the modern skepticism. We will ask: what does it mean for a correlation to be "real"? And what does it mean for us, as inquirers, to take seriously patterns that challenge our assumptions about human agency and cosmic influence?

The Solar Cycle

The sun follows an approximately 11-year cycle of activity. During solar maximum, sunspots proliferate, solar flares erupt, and the sun's magnetic field becomes more complex. During solar minimum, the sun is relatively quiet, its surface marked by fewer disturbances.

This cycle is not perfectly regular—it varies between 9 and 14 years—but it is persistent. Records of sunspot observations extend back to the 17th century, and indirect evidence suggests the cycle has been operating for millennia.

The mechanisms are complex. Solar activity affects the Earth's magnetosphere, which in turn affects the ionosphere, which influences radio propagation, satellite communications, and—crucially—the flow of charged particles through the atmosphere. These particles can affect

biological systems in ways we are still discovering.

Historical Patterns

Historical records show correlations between solar activity and human events that are too consistent to dismiss as coincidence. Periods of high solar activity have coincided with wars, revolutions, and social upheavals. Periods of low activity have often been marked by relative stability, but also by stagnation and decline.

The pattern is not deterministic—solar activity does not cause wars—but it appears to correlate with periods of increased human agitation, creativity, and conflict. The mechanism is unclear, but the correlation is statistically significant when examined across centuries of data.

This is not to say that solar cycles determine human behavior. Rather, they may create conditions that make certain behaviors more likely. Just as weather affects mood without determining it, solar activity may influence human psychology and social dynamics in ways that are subtle but measurable.

Statistical Methods and Skepticism

Modern data science has given us tools to examine these correlations more rigorously. Time series analysis, correlation coefficients, and significance testing can help us distinguish signal from noise. But these tools also reveal the complexity of the relationship: it is not simple, not linear, not deterministic.

Skeptics point to confounding variables, to the difficulty of establishing causation, to the possibility of spurious correlations. These are valid concerns. Correlation does not imply causation, and the relationship between solar activity and human behavior is mediated by countless other factors.

But skepticism, when it becomes dogmatic, can also blind us to patterns that are real but complex. The fact that a relationship is not simple does not mean it is not real. The fact that we cannot fully explain a mechanism does not mean the correlation is meaningless.

Modern Data and Contemporary Inquiry

Contemporary research in heliobiology uses methods that were not available in earlier periods. Satellite data, geomagnetic monitoring, and large-scale epidemiological studies allow us to examine the relationship between solar activity and human health, behavior, and social dynamics with unprecedented precision.

The results are mixed. Some studies find strong correlations; others find weak or nonexistent relationships. This inconsistency is not necessarily a sign that the relationship is spurious; it may indicate that the relationship is context-dependent, mediated by other factors, or more complex than simple correlation analysis can capture.

This is the challenge of inquiry in complex systems: the patterns we seek are often subtle, conditional, and resistant to simple statistical analysis. But this does not mean we should abandon the inquiry. It means we must be more careful, more nuanced, more willing to hold multiple hypotheses simultaneously.

What Does It Mean for a Model to Be "Right"?

This question connects to the broader theme of this issue: how do we know what we know? When we observe a correlation between solar cycles and human behavior, what are we actually observing? Are we seeing a causal relationship? A spurious correlation? A pattern that is real but whose mechanism we do not understand?

The answer depends on what we mean by "right." If we mean "causally determined," then the relationship is probably not "right" in that sense. Solar cycles do not cause wars; they may create conditions that make wars more likely, but the actual causes are social, political, economic.

If we mean "statistically significant," then the relationship may be "right" in that sense—the correlation is too strong and too consistent to dismiss as chance.

If we mean "useful for prediction or understanding," then the relationship may be "right" in a pragmatic sense, even if we cannot fully explain it.

This is the challenge of inquiry: we must hold multiple definitions of "right" simultaneously, and we must be willing to revise our understanding as new evidence emerges.

Implications for Inquiry

What does this mean for how we conduct inquiry? First, it suggests that we should be open to patterns that challenge our assumptions, even when those patterns are difficult to explain. Second, it suggests that we should be careful about dismissing correlations as "spurious" simply because we cannot explain them. Third, it suggests that we should be humble about our ability to understand complex systems, and willing to acknowledge uncertainty.

The relationship between solar cycles and human behavior is not a settled question. It is an ongoing inquiry, one that requires careful statistical analysis, historical research, and theoretical development. But it is an inquiry worth pursuing, not because it will give us definitive answers, but because it will help us understand the complexity of the systems we inhabit.

Conclusion

The sun pulses, and we respond. The relationship is complex, mediated by countless factors, and resistant to simple explanation. But it is real, measurable, and significant. To ignore it because it challenges our assumptions about human agency is to close ourselves off from a deeper understanding of the systems we inhabit.

Inquiry requires that we remain open to patterns we do not fully understand, correlations we cannot fully explain, and relationships that challenge our assumptions. The relationship between solar cycles and human behavior is one such pattern. It is not a settled question, but it is a question worth asking—and worth asking carefully, with attention to both the data and the skepticism it has generated.

Faculty essays at Castalia Institute are authored, edited, and curated under custodial responsibility to ensure accuracy, clarity, and ethical publication.

References

1. Chizhevsky, A. L. (1936). Les épisodes de l'activité solaire et de l'organisme humain. Gauthier-Villars.
2. Eddy, J. A. (1976). The Maunder Minimum. Science, 192(4245), 1189–1202.
3. Hathaway, D. H. (2015). The solar cycle. Living Reviews in Solar Physics, 12(1), 4.
4. Stetson, H. T. (1937). Sunspots and Their Effects. McGraw-Hill.
5. Haigh, J. D. (2007). The Sun and the Earth's climate. Living Reviews in Solar Physics, 4(2), 2.
6. National Research Council. (2013). The Effects of Solar Variability on Earth's Climate. National Academies Press.

Useful correspondence only. Leave whenever you wish.

Daniel C McShan

Custodian / Founder of Castalia Institute

Monument, Colorado

Daniel C McShan writes and edits The Inquirer at Castalia Institute from Monument, Colorado, connecting rigorous inquiry with humane, forward-looking education and technology.

Full bio · Articles in The Inquirer