



IN MEMORIAM: THE CONTRIBUTIONS OF R. SCOTT FREY

Frey on “The Transfer of Core-based Hazardous Production Processes to the Periphery”: Contributions, Inspirations, and Lasting Legacy

Kelly F. Austin
Lehigh University
kellyaustin@lehigh.edu

Abstract

I consider Scott Frey’s work on “The Transfer of Core-Based Hazardous Production Processes to the Export Processing Zones of the Periphery: The Maquiladora Centers of Northern Mexico,” published in 2003, including the contributions of this research to broader thinking on world-systems theory and peripheral industrialization. I also discuss how Frey’s article has inspired my own research, and why I use this article in my seminar on the political economy of globalization. I argue that the ideas presented in Frey’s article continue to be deeply relevant today. He leaves behind a legacy that will inspire and influence current and future generations of world-systems scholars and global citizens.

Keywords: Political economy, Maquiladoras, Export processing zones

I first read Scott Frey’s article, “The Transfer of Core-Based Hazardous Production Processes to the Export Processing Zones of the Periphery: The Maquiladora Centers of Northern Mexico” as a first-year graduate student, about 13 years ago. This article was originally published in the *Journal of World-Systems Research*, a few years prior, in 2003. It was at this time that I was beginning to question my focus in graduate school on U.S. inequality issues and the sociology of education. Frey’s writing on export processing zones (EPZs), and the resulting environmental, health, and broader development impacts in poor nations illuminated me to the wider and deeper



Articles in vol. 21(2) and later of this journal are licensed under a Creative Commons Attribution 4.0 United States License.



This journal is published by the [University Library System](#), [University of Pittsburgh](#) as part of its [D-Scribe Digital Publishing Program](#) and is cosponsored by the [University of Pittsburgh Press](#).

intensity of international inequalities experienced across nations. This article helped to foster my curiosity in why poor nations remained so far “behind” countries like the United States, and ultimately contributed to setting me on a path as a political-economy scholar.

In this piece, I will honor Scott Frey’s work by first exploring the key themes in his article on “The Transfer of Core-Based Hazardous Production Processes to the Export Processing Zones of the Periphery” and explaining how this research contributes to ideas in world-systems theory and unequal exchange, as well as the dynamics of peripheral industrialization. Next, I consider how this scholarship has inspired my own work and continues to shape my research trajectory today. Lastly, I discuss why I use this article in my senior-level seminar on The Political Economy of Globalization, and share some feedback on the piece directly from current students. While Scott Frey’s passing was unexpected and tragic, I am confident that his work will live on and continue to inspire current and emerging world-systems scholars.

Contributions and Connections

Frey’s writing on “The Transfer of Core-Based Hazardous Production Processes to the Periphery” examines the motivations, processes, and consequences of the movement of core-based industries to the peripheral zones of the world-system. In so doing, he provides a very comprehensive look at “offshoring,” including the factors that drive this type of political-economic globalization in core nations and the environmental, health, and socio-economic consequences in poorer nations. He uses a focus on the proliferation of maquiladoras along the U.S.-Mexico border in the 1990s to frame and illuminate this discussion. But his work in this article also speaks more broadly to the emergence of EPZs in developing nations and the costs and contradictions of peripheral industrialization.

In beginning with the motivations of the movement of core-based industries abroad, Frey engages foundational ideas on world-systems theory and capitalist development regarding the desire to increase profits in core nations, specifically among core-based transnational corporations (TNCs). Drawing on essential philosophies in this tradition by Wallerstein (1974), a capitalist world economy can be defined as a system in which priority is given to the endless accumulation of capital. The global capitalist world economy is held together by an international division of labor, where core nations specialize in industries that are more monopolistic, and periphery nations engage in production processes that are truly competitive (Wallerstein 1974). Frey demonstrates the competitive nature of maquiladora-based production in Mexico by illustrating how these factories often focus on producing the component parts, such as the electrical mechanisms, that are needed for finished commodities. Such competitive pressures also serve to keep wages low in the periphery, and certainly the differences in wages between core and peripheral nations represents a key axiom of the

international division of labor and processes of unequal exchange (e.g. Emmanuel 1972; Wallerstein 1974).

In addition to a drive for profits, Frey conveys that the success of environmental and labor movements in the Global North represent mechanisms that also facilitate the transfer of hazardous and dangerous industries abroad. Throughout this piece, Frey astutely considers evidence for and against such propositions, but reconciles divergent points of view by coming back to basic evidence, such as that production costs are ultimately lower in places like Mexico. I also appreciate how fundamental ideas portrayed about the success of the core, in regards to environmental movements for example, are intrinsically connected to displacement of environmentally-degrading industries abroad. Concrete examples like these help to demonstrate central, take-home messages in world-systems thinking, including that development represents a zero-sum game (e.g. Hornborg 2009). “Successes” in core nations are only possible because periphery nations shoulder the “losses.”

Peripheral industrialization was initially pursued during the 1950s and 1960s, guided by modernization thinking. Rostow (1960) and others argued that to encourage development in poor nations, these nations should adopt the production profiles of the core and industrialize. While such strategies were initially pursued through import-substitution industrialization, persistent inequalities between and within nations limited local market demand in peripheral nations, and much industrialization during this time was enabled through foreign debt. Conditions bottomed out in the 1980s with the debt crisis, and subsequently neoliberal reforms including trade liberalization were instituted as a way to ameliorate these trends (e.g. McMichael 2017). Such historical transformations set the stage for Frey’s focus on EPZs, which represent “free trade zones” in periphery nations. Established as a means to attract foreign industry, these zones are typically exempt from labor regulations and domestic taxes. In many nations, EPZs are physically separate from the rest of the country, walled and gated, and established in accessible areas to easily receive raw materials and export the output by sea or aircraft (McMichael 2017).

Peripheral industrialization was pursued under the rhetoric of promoting national economic growth. As Frey writes, “The purpose of the [Border Industrialization] program was to promote industrialization, employment, and new technology imports and management practices” (Frey 2003: 323). However, many argue that this is not the case, as EPZs are “contributing little to the host economy, other than mostly dead-end jobs and foreign currency earned via export taxes levied by host states” (McMichael 2017: 88). Frey’s writing illustrates these claims by closely examining not only the overall lack of economic benefits in Mexico, but also the working conditions endured, mainly by women, in maquiladoras.

In elaborating on the harmful consequences of the maquiladora industry in Mexico, Frey’s work contributes to broader thinking on gender, health, and the environment. His research

demonstrates the preference for female employees due to their willingness to work for less and their representation as a more complacent workforce. Frey elaborates on the discrimination women suffer in the factories, including being subject to routine pregnancy tests, sexual harassment, rape, and working with dangerous chemicals that cause infertility, cancer, kidney failure, and a variety of other health problems.

Indeed, Frey's elaboration on the health risks of the maquiladora industry represents a key contribution of this work. His arguments are uniquely framed by neoliberal implications that lives in the periphery are worth less than those in affluent nations. Frey discusses health problems that arise from industrial accidents, occupational injuries, surface water contamination, and the improper handling of hazardous wastes resulting from maquiladoras. He draws on clear evidence demonstrating that morbidity and mortality rates are much higher in Mexican border towns than just a few miles away on the U.S.-side of the border. This is not only due to the harmful pollutants and working conditions in the maquiladoras themselves, but also the rapid population growth and lack of public health infrastructure that characterize the areas where maquiladoras are established.

Certainly, the health consequences discussed largely result from the environmental problems of maquiladoras, and a key focus of this piece and of Frey's work more generally is on the environmental impacts of periphery production processes. In examining the environmental impacts of maquiladoras, he discusses soil contamination, air and water pollution, biodiversity loss, water shortages, and industrial waste. Frey is also careful to point out that the raw materials or inputs for production at the factories in Mexico come from poorer regions, such as other areas of Latin America, Southeast Asia, and Sub-Saharan Africa. In doing so, he's implicitly making reference to key ideas in the world-systems tradition, such as "recursive exploitation" (e.g. Burns et al. 2003).

Although Frey does not explicitly utilize the concept of "ecologically unequal exchange" in this research on maquiladora centers in Mexico, he is certainly engaging with these ideas, which represent a dominant line of thinking throughout his scholarship. The foundational concept of "unequal exchange" reflects that the world-economy is stratified with the highest skill, wage, and profit-making industries concentrated in nations positioned at the top of the international hierarchy, while low-skill, low-wage, and low-profit production is chiefly found in poor nations (e.g. Mahutga 2014; McMichael 2017). Thus, the exchange of high-value goods for low-value goods leads to surplus value flows up the stratified world-system, reproducing global inequalities. As low-skill, low-wage industries are most commonly environmentally-damaging industries, there is an essential ecological dimension to unequal trade relationships as well.

A wide body of Frey's work in political-economy is dedicated to exploring processes of ecologically unequal exchange, where more-developed nations are able to externalize their consumption-based costs to less-developed nations, in essence, using an unfair amount of environmental space in poor nations. Another way of explaining this idea is through the metaphor of the "consumption – degradation paradox." While core nations consume the most resources, they tend to have very low rates of environmental degradation within their borders. Conversely, poorer nations like Mexico have much lower rates of consumption, but have the highest rates of environmental destruction (Rice 2007). Thus, not only are manufacturing industries off-shored, but so are the environmental consequences of such production. A significant contribution of Frey's maquiladora article, which also appears in much of his other work, involves making explicit the connection between environmental degradation and human health issues in peripheral nations, a point I will expand on in more detail below.

Frey finishes "The Transfer of Core-Based Hazardous Production Processes to the Periphery" by weighing the costs and benefits of the maquiladora industry in Mexico and considering the impact of NGOs or social movements in countering these damaging trends. Throughout the piece, Frey describes the potential benefits of neoliberal development from a modernization perspective, including job creation, GDP growth, and the idea that the conditions in some maquiladoras are better than working in the informal sector. However, he conveys that it is clear that Mexico is not in control of the profits that are made; the majority of the benefits of maquiladora production are accumulated by core-based TNCs and by a few local elites in the periphery that benefit from such relationships. "Even if the economic costs and benefits associated with the transfer of hazardous industries could be estimated and valued in a meaningful fashion, it is doubtful that the benefits accruing to Mexico would cover the costs" (Frey 2003: 335). I would add that GDP growth that includes human suffering, discrimination, and devastation to the environment are ultimately not developmental gains, but losses. While some social movement groups are able to exert pressure on TNCs, Frey seems cautious about the potential of NGOs to undo the harmful impacts of the maquiladora industry, as these processes are embedded in the stratified and deeply rooted structure of the world-system.

Inspiring Scholarship

As I mentioned earlier, I read Frey's article on "Export Processing Zones of the Periphery" at a time when I was in graduate school and refocusing my interests in sociology. My encounter with Frey's work led me to concentrate on political-economy and environmental sociology as my core areas of interest. In the early part of my academic career, I was deeply focused on the theorization of "ecologically unequal exchange." As I kept revisiting Frey's work throughout my own development as a researcher and educator, I also began to think more broadly about the

consequences of peripheral production processes in poor nations, including impacts to human health and gender inequalities.

Using Frey's work as inspiration, I began to consider the deep connections environmental issues have to human well-being. As people in poor nations are fundamentally dependent on the natural environment for food, fuel, and other resources, the disproportionate amount of degradation that is placed on peripheral nations necessarily impairs human health in direct or indirect ways. So not only do unequal trade relationships have an inherent ecological dimension, but there is an intrinsic well-being component as well. Just as environmental problems are off-shored through global inequalities, so are contaminant costs to human life. Frey's article on the maquiladora industry represents an early example of this line of thinking, and thus in many ways, he represents a pioneer in theorizing environment and health connections through a world-systems lens.

The current focus of my work explores this line of thinking, illuminating inequalities in environmental degradation and disease in the less-developed nations, and the nexus between the two. Just as the conceptualization of unequal exchange grew to encompass ecological dimensions over the last several decades, my work builds on Frey's to expand ideas about ecologically unequal exchange to also consider the resulting social and health consequences of disproportionate degradation. Some of my work looks at direct connections between peripheral production processes, degradation, and disease, such as making associations between export agriculture, deforestation, and malaria vulnerabilities (e.g. Austin et al. 2017). Other work explores linkages between degradation and health involving more indirect mechanisms, such as the idea that environmental degradation in poor nations makes it more difficult for women to provide needed household resources, thus contributing to unsafe sexual behaviors or the "sex for food trade" and vulnerabilities to HIV (e.g. McKinney and Austin 2015).

In addition to inspiring my current research agenda, Frey helped me develop as a scholar by serving as an amazing mentor. Although I was not one of his formal students or a doctoral advisee, he still went out of his way to mentor me and encourage my work. He would often personally e-mail me relevant conference announcements or calls for papers. On several occasions, he sent me quick notes congratulating me on a piece of published scholarship. He made an effort to greet me and interface with me at conferences. He had no incentive to do so; rather, his good-natured, personable, and friendly personality, and sincere desire to encourage those around him, including junior scholars, prompted him to do so. These qualities can be all too rare in our field. Thank you, Scott, for all your kindness, affability, and support.

Considering Frey's Work in the Classroom

Each spring semester, I teach a senior seminar titled, *The Political Economy of Globalization*. Frey's article on "The Transfer of Core-Based Hazardous Production Processes to the Periphery" is a required reading in the course. I enjoy using this piece for a variety of reasons. One is that this article covers a lot of ground in a relatively parsimonious and accessible manner. As emphasized earlier, Frey nicely balances a discussion of the motivations, features, and consequences of peripheral industrialization. He engages interesting and, at times, shocking and graphic discussion of the environmental, health, and social consequences of the maquiladora industry in Mexico. Such details on the level and distribution of environmental pollutants and the subjugation of women in factories, for example, are eye-opening and provocative to students. For example, one student wrote in a reaction to Frey's article, "I had no idea that the U.S.-Mexico border was such a hot 'growth zone' with few restrictions on practices... I found it alarming that the infant mortality and age-adjusted general morality rates on the Mexican side of the border are not only higher than the U.S. rates, but higher than the rates for Mexico as a whole! My jaw literally dropped while I read this."

The article also serves as a useful jumping off point for examination of important policies and transformations that facilitate offshoring to poorer nations. For example, Frey briefly discusses initiatives such as the General Agreement on Trade and Tariffs (GATT) and the North American Free Trade Agreement (NAFTA). The concrete examples provided through his rich description of the maquiladora industry, including the types of factories, such as textiles, electronic materials, wood and metallic furniture parts, and chemical products, help students to visualize the physical products coming out of these processing zones, as well as how they often only represent "component parts," rather than higher-value completed products. Frey also identifies the companies associated with these plants, including household names students are familiar with, such as Wal-Mart, Chrysler, DuPont, Ford, General Electric, Toshiba, Mattel Toys, Sony, and Canon. Such tangible details allow the themes to resonate more deeply with students, which is extremely important when tackling challenging and often abstract ideas about political-economy and global inequalities.

Frey engages many important terms, like "pollution havens", "boom towns", "neoliberalism", and the "environmental Kuznets curve," but often does so contextually, where he conveys the idea of the concept through his writing, but not with a formal or explicit definition. Such an approach serves as a great jumping off point for considering these important concepts in more depth in small- and large-group discussions. Additionally, many of the "vocabulary words" he utilizes stick with the students and help them to understand the relevance of the material. For example, one student wrote, "It is unethical to push down to the South hazardous industries so that periphery nations get all the negative consequences while the core nations remain mostly unscathed. Frey talked about

this being ‘risk discrimination’ where core-based TNCs receive most of the profits from sales while Mexico bears most of the costs.”

Lastly, Frey presents arguments judiciously, considering modernization-based or neoliberal rationales when presenting contrasting viewpoints from critical political-economy. This is especially important at the institution I work at, which is dominated by a robust business school, and many students are from more affluent backgrounds. I often encounter students who come into the course thinking that the spread of transnational business is inherently a good thing, or are predisposed before taking to class to side with arguments in favor of market liberalization. Thus, Frey’s approach to difficult topics, like the potential costs and benefits to the maquiladora industry, helps to generate discussion by demonstrating that while there may be some benefits, it is extremely hard to argue that these outweigh the costs of EPZs in light of the evidence provided.

Many students have a hard time grappling with why peripheral nations would accept industries that fail to generate sustained economic growth while causing so much damage to the environment and human lives. But Frey’s writing is clear on that point as well: “...many peripheral nations are so anxious to industrialize that they are willing to accept almost any industry offered: hazardous or otherwise” (Frey 2003: 323). In other words, I don’t have to go beyond the reading to justify its points; instead I can encourage students to find the answers themselves within this article.

Conclusion

Although Scott Frey wrote his piece on “The Transfer of Core-Based Hazardous Production Processes to the Export Processing Zones of the Periphery” over 15 years ago, the ideas presented remain keenly relevant today. In recent years, inequalities between and within nations have only gotten wider, and while neoliberal development dynamics are at the root of the problem, these same policies continue to be recycled as the solution (McMichael 2017). The power of transnational corporations continues to grow. Currently, about 70 of the largest 100 economies are TNCs, superseding many core nations (World Bank 2016). The movement of production activities to poor nations remains driven by a hunt for cheap wages, tax breaks, and lax environmental laws and safety regulations. While peripheral industrialization may provide jobs in poor nations, in the overwhelming majority of cases, it is clearly not contributing to successful or long-term development.

Frey’s work on unequal exchange and political-economic inequalities is vast and impactful. He leaves behind a legacy that will continue to inspire and influence current and future generations of world-systems scholars and global citizens who are concerned over the developmental challenges that unfairly plague poor nations. Frey has been a major inspiration

in my own work, and served as an amazing informal mentor. I hope that in my own career I can make even a fraction of the impact that he has through his scholarship, teaching, and example of how to be a supportive and positive colleague.

About the Author: Kelly F. Austin is Associate Professor of Sociology in the Department of Sociology and Anthropology at Lehigh University. Her research interests include Global Health, Medical Sociology, and Globalization & Development.

References

- Austin, Kelly F., Priyokti Rana, and Megan Bellinger. 2017. "Deforestation Breeds Malaria: Environmental Change and Infectious Disease in Poor Nations." *AIMS Environmental Science*, a special issue on *The Environmental Determinants of Infectious Diseases* 4(2): 217-231.
- Burns, Thomas J., Kick, Edward L., and Davis, Byron. 2003. "Theorizing and Rethinking Linkages between the Natural Environment and the Modern World-System: Deforestation in the Late 20th Century." *Journal of World-Systems Research* 9(2): 357-390. DOI: <http://jwsr.pitt.edu/ojs/index.php/jwsr/article/view/237/249>.
- Emmanuel, Amin. 1972. *Unequal Exchange*. New York: Monthly Review Press.
- Frey, Scott. 2003. "The Transfer of Core-Based Hazardous Production Processes to the Export Processing Zones of the Periphery: The Maquiladora Centers of Northern Mexico." *Journal of World-Systems Research* 9(2): 317-354. DOI: <http://jwsr.pitt.edu/ojs/index.php/jwsr/article/view/236/248>.
- Hornborg, Alf. 2009. "Zero-Sum World: Challenges in Conceptualizing Environmental Load Displacement and Ecologically Unequal Exchange in the World-System." *International Journal of Comparative Sociology* 50(3): 237-262.
- Mahutga, Matthew. 2014. "Global Value Chains and Global Production Networks in the Changing International Political Economy." *Review of International Political Economy* 21(1): 157-194.
- McKinney, Laura and Kelly F. Austin. 2015. "Ecological Losses are Harming Women: A Structural Analysis of Female HIV Prevalence and Life Expectancy in Less-Developed Countries." *Social Problems* 62: 529-549.
- McMichael, Phillip. 2017. *Development and Social Change: A Global Perspective, 6th Edition*. Thousand Oaks, CA: Pine Forge Press.

Rice, James. 2007. "Ecological Unequal Exchange: International Trade and Uneven Utilization of Environmental Space in the World System." *Social Forces* 85(3): 1369–1392.

Rostow, Walt. W. 1960. *The Stages of Economic Growth: A Non-Communist Manifesto*. London, England: Cambridge University Press.

Wallerstein, Immanuel. 1974. *The Modern World-System, Volume I: Capitalist Agriculture and the Origins of the European World-Economy in the 16th Century*. New York: Academic Press.

World Bank. 2016. "The World's Top 100 Economies: 31 countries; 69 corporations."

<https://blogs.worldbank.org/publicsphere/world-s-top-100-economies-31-countries-69-corporations>.