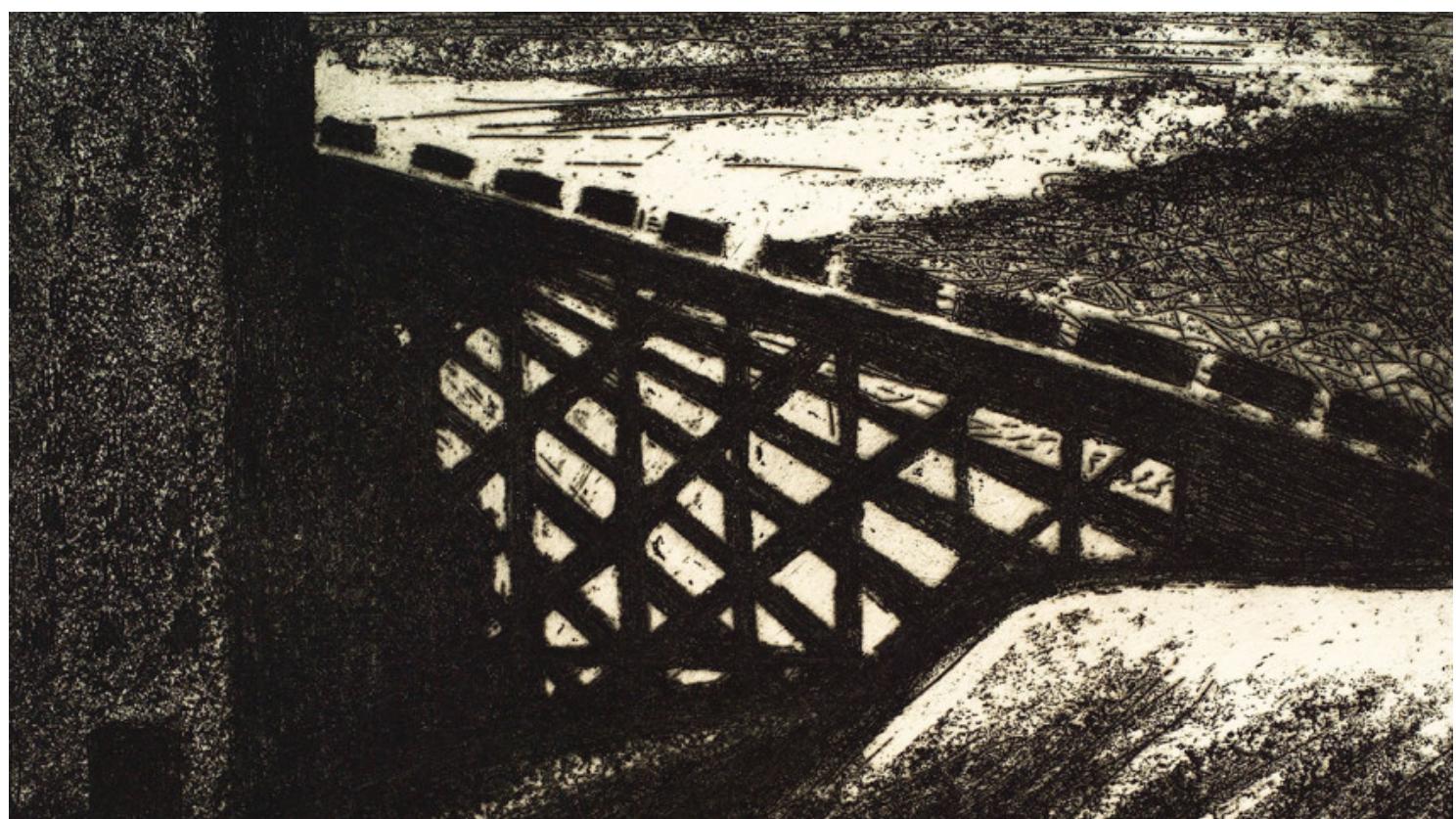


# Research: The Industrial Revolution Left Psychological Scars That Can Still Be Seen Today

by Martin Obschonka

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The Industrial Revolution, which brought together large-scale coal-based industries like mining, steel, pottery, and textiles, helped create the foundation of modern society and wealth. At the same time, the early industrial economies that formed in this era were also associated with brutal working and living conditions. Our research, recently accepted by the *Journal of Personality and Social Psychology*, shows that areas where coal was king may still be feeling the effects.

In countries like the UK and the U.S. that industrialized early, coal now plays only a minor role in the economy. For example, in the U.S. today, the entire coal industry employs about 53,000 people, with only about 11,000 of those working in extraction. Coal production and consumption have also declined markedly. Yet prior research has found that in the areas of the U.S. and UK where coal still is a major industry, it affects local populations in a profound way. For example, people who live in areas with active coal mining today often experience greater risk of mental and physical health issues, such as depression, anxiety, COPD, and asthma, than people in other regions. Research also shows that besides the occupational health risks that miners face, these regions pose increased population-wide health risks due to pollution and economic hardship.

Today, millions of people live in such regions that once brought together large-scale coal-based industries, for example in the old industrial north of the UK and the so-called Rust Belt in the U.S. Given that these historical industries had dominated the economic and social life of these regions for such a long time, we wanted to explore whether they continue to influence the people currently living there. Our research suggests that the massive industrialization of the 19<sup>th</sup> and 20<sup>th</sup> centuries had long-term psychosocial effects that continue to shape the well-being, health, and behaviors of millions of people in these regions today.

Our study, an interdisciplinary collaboration between psychologists, historians, and economic geographers, examined whether people in former industrial regions in the U.K. and the U.S. demonstrated more markers of “psychological adversity” (i.e., higher neuroticism, lower conscientiousness, lower aspects of extraversion, lower life satisfaction, and lower life expectancy) than people in other regions. To reach back to the Industrial Revolution, we had to examine different sources of unique historical data on regional industry structure – one source, for example, was baptism records from 1813-1820 that stated the occupation of the father. We were able to determine the share of employment in large-scale coal-based industries, such as coal mining, and in steam-powered manufacturing industries that used coal as fuel, such as pottery, textile production, and metal manufacturing. This was our measure for the historical concentration of large-scale, coal-powered industries in a region.

We also used existing online surveys to collect personality trait data from 381,916 current residents of England and Wales and 3,457,270 residents living in the U.S., looking at which regions had more people reporting so-called unhappy personality traits: higher neuroticism (characterized by greater emotional instability, worrying, anger), lower conscientiousness (less

self-control and self-management), and lower extraversion (less sociable, outgoing, and fun-oriented). These have been tied to lesser psychological well-being and poorer health behaviors. We also studied life satisfaction and life expectancy across regions.

Our research shows that a region's historical industries leave a lasting imprint on the local psychology, which remains even when those industries are no longer dominant or have almost completely disappeared. We found that in regions like Blaenau Gwent in the UK and the Rust Belt in the U.S., people reported more unhappy personality traits, lower life satisfaction, and lower life expectancy than otherwise similar regions where these industries did not dominate (think Sussex and Dorset in the non-industrial South of England and regions in the American West). For example, in the UK, neuroticism was 33% higher, conscientiousness 26% lower, and life satisfaction 29% lower in these areas compared with the rest of the country. This effect was robust even when controlling for other historical factors that might have affected the well-being of regions, such as historical energy supply, education, wealth, geology, population density, and climate.

To come to more causal conclusions, we needed to determine that a region's industrial history is what caused residents to have these personality traits today, rather than regions with a certain personality structure attracting large-scale industries during the Industrial Revolution. We employed an instrumental variable analysis, using the natural location of coalfields in the year 1700. The early industrial centers often emerged near coalfields because coal was expensive to transport and plants were mostly powered by steam engines that required large amounts of cheap coal. Even among these industrial centers – which are likely to have emerged owing to their proximity to coal, and not to any pre-existing personality trends – we observed lower well-being and more adverse personality traits, consistent with idea that a region's industrial history affects its personality structure.

Since the historical industries appear to exert long-term psychological effects, our next task was understanding the mechanisms driving this. We've long known that work and living conditions were bad in old industrial centers – the daily work in the plants and mines was often highly repetitive, stressful, and exhausting, not to mention dangerous, and child labor was very common. We also know from psychological and sociological studies that specific work characteristics, such as a lack of autonomy and complexity at work, can shape the personality of workers in a negative way, for instance by lowering intellectual flexibility and personal initiative. Adam Smith had even argued in 1776 that the division of labor, resulting in highly-specialized and repetitive work tasks, comes with detrimental psychosocial effects for the workers.

Other studies have shown how work characteristics of parents, such as self-direction and conformity at work, get “transmitted” to their children via parenting practices and a socialization of values and norms that leads them to mirror these characteristics. For example, highly repetitive, exhausting, and low-autonomy work can affect the values of workers, in that they put less value on intellectual virtues and critical thinking, and these values then often get transmitted to the children of these workers as well. In addition to these socialization mechanisms, we also know that personality has a genetic basis, which may help certain traits persist across generations.

Finally, we also know that personality is shaped by local institutions such as schools, local attitudes, and social standards. For example we know that school students’ attitudes about unhealthy behaviors and alcohol are influenced by their friends’ and neighbors’ attitudes about these issues. So it’s possible that even people who moved to old industrial regions, versus those whose families had always been there, would be affected by prevailing personality traits and values.

We speculated that migration patterns would contribute to industrialization affecting future personality traits. There are a couple reasons to think this: First, during the Industrial Revolution there might have been a certain “genetic founder effect” at play – that is, the massive influx of a specific personality type into the emerging and quickly growing industrial centers. For the U.K., there are historical analyses arguing that the emerging industrial centers were mainly populated by people from neighboring rural areas who had suffered economic and psychological hardship, such as major famines in Ireland. Such a massive influx might have established an initial level of psychological adversity in these industrial regions during the Industrial Revolution, which would affect and shape the personality structure of subsequent generations in these regions.

Second, people with happier personalities might move away from these regions, which could boost the concentration of unhappy personality traits there today. We found support for this in our data. When we compared people who grew up and stayed in old coal regions with people who grew up there but later left, we found that those who left scored lower in neuroticism and higher in conscientiousness and in aspects of extraversion.

In sum, the effect of the Industrial Revolution seems to be more toxic and far-reaching than previously thought. While massive industrialization brought unprecedented technological and economic progress, it also left a psychological legacy that continues to shape the personality

traits and well-being of people currently in these regions. Regional personality, which can provide a sense of local identity and pride, can still reflect the historical hardships and difficult work and living conditions of past generations. Without a strong orchestrated effort to improve economic circumstances and people's well-being and health in these regions, this legacy is likely to persist.

This research should remind us that the dominance of a certain industry or type of work can have unexpected, long-term effects on the personality structure of regions – and these can be felt long after they change.

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