



Howling Winds: Sound, Sense, and the Politics of Noise Regulation

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Abstract

This paper explores attempts made in North America to govern noise and uses the current debates over the impact of wind turbines on human health as a site for examining the politics of noise regulation. I address a number of key questions: First, how has noise been defined and how have these definitions changed over time? Second, how have we tried to control noise and on what grounds have we done this? Lastly, how have our responses to noise been shaped by who is making the noise and who is being disturbed? I argue that our understandings of noise and how we regulate it cannot be disentangled from the broader social, political, cultural, and technological contexts in which these discussions take place. Ultimately, the debates about noise regulation have as much to do with who is making the noise and who is being disturbed as the noise, itself.

Keywords: sound, noise, regulation, urban, rural

Résumé

Cet article explore les tentatives de gestion des bruits utilisées en Amérique du Nord. Les débats actuels relatifs à l'impact des éoliennes sur la santé humaine seront examinés afin d'étudier les politiques de régulation du bruit. J'aborde, dans cet article, un certain nombre de questions clés. Premièrement, de quelle manière le bruit a-t-il été défini, et comment ces définitions ont-elles évolué au fil du temps? Deuxièmement, de quelle façon avons-nous tenté de contrôler le bruit, et sur quels motifs ces tentatives s'appuyaient-elles? Dernièrement, de quelle manière nos réponses au bruit ont-elles été façonnées par les personnes qui produisent le bruit et par celles qui sont affectées par celui-ci? J'argue que notre compréhension du bruit, ainsi que la façon dont nous le réglementons, ne peuvent être dissociées des contextes sociaux, politiques, culturels et technologiques plus larges dans lesquels ces discussions se déroulent. Ultimement, les débats sur la régulation du bruit se rapportent autant aux personnes qui sont responsables du bruit et celles qui sont perturbés par ce dernier, que le bruit lui-même.

Mots clés : Son, bruit, réglementation, urbain, rural

Introduction

“They say the noise causes cancer ... If you have a windmill anywhere near your house, congratulations—your house just went down 75% in value.” –US President Donald Trump discussing wind turbines at the National Republican Congressional Committee fundraiser in Washington, DC, April 2, 2019.

Though falling well short of US President Donald Trump’s wildly outlandish and scientifically unfounded declaration that wind turbines cause cancer, many rural residents living in close proximity to them are claiming that the noise they generate has resulted in a variety of physical ailments ranging from chronic headaches to dizziness. In the province of Ontario, a number of anti-wind coalitions have formed to try and stop these energy projects from moving forward, citing the harms produced by this noise as one major factor.¹ For socio-legal scholars, the current debate over the impact of wind turbines on human health provides a very interesting case study for examining the politics of noise regulation. More specifically, the site allows us to critically analyze how rural residents have tried to translate their subjective encounters with wind turbine noise into objective “matters of fact” (Latour 2004) and why, despite all of their efforts, they have been unsuccessful at halting the development of these energy projects or curbing the noise they produce.

We can also use this example to draw interesting comparisons between the ways in which noise is problematized and regulated in urban versus rural settings. Indeed, while anti-noise activists in the country have raised very similar concerns about the potentially harmful effects of noise on human health as their city-dwelling counterparts, these arguments have largely fallen on deaf ears. On a more theoretical level, these differences in how noise is governed serve to highlight the “relationality” of how we come to sense, experience, and know sound (Novak 2015, 126). As Novak explains, “Noise is an essentially relational concept. It can only take on meaning by signifying something else.” In this way, noise is not a kind of sound *per se*, but a “meta-discourse of sound and its social interpretation” (*ibid.*). What we consider to be noise is always dependent on the contexts of production and reception (*ibid.*; but see also Smith 2012).

In this paper, I adopt this relational approach (Novak 2015; but see also Valverde 2011, 294) and use the case of wind turbines to illustrate that what we define as “noise” and how we choose to govern it cannot be disentangled from the broader social, political, cultural, legal, and technological landscapes in which these debates take place. In doing so, I address a number of key questions: First, how has noise been defined and how have these definitions changed over time? Second, how have we tried to control and limit noise and on what grounds and with what standards have we done this? Lastly, how have our responses to noise been shaped by who is making the noise, who is being disturbed or harmed, and the wider settings in which these disputes occur?

¹ To be clear, many of these groups are opposed to wind energy projects for a variety of reasons ranging from depreciated property value to their impact on birds and wildlife. For the purposes of this paper, however, I will be focusing on their objection based on the health effects of wind turbine noise.

By focusing on the current controversy surrounding wind turbine noise and its impact on rural residents, the paper also aims to shed light on a topic that has been grossly under-researched. Indeed, while there has been a considerable amount of scholarship written about the regulation of urban noise, far less attention has been paid to the noises heard in the countryside. Wind turbines are a contemporary example of an emerging technology that many believe is responsible for introducing a brand new type of industrial noise into rural spaces. And, in much the same fashion that the prevailing culture of early industrialization influenced the ways in which the noises emanating from the factory floors were experienced and interpreted (see Smith 2012), the current social, political, and cultural context surrounding wind energy serves as an important backdrop for how we come to sense, know, and potentially regulate the sounds generated by these machines.

In the section that follows, I discuss the early attempts to curtail urban noise in the late nineteenth century. Particular attention is paid to how early abatement campaigners problematized noise and its impact on people's health and wellbeing, and the ways in which the various remedies to the urban noise problem were rationalized and justified. I then look at how the introduction of noise measurement technologies in and around the 1920s drastically altered how noise was regulated and governed.

Silencing Noisy Cities

Throughout history, noise has been considered a public nuisance requiring some type of government control. In ancient Rome, rules were set in place that limited the amount of night-time noise emitted by horses and wagons that would disrupt the sleep of residents (WHO 1999). However, it is not until the 1800s that we begin to witness real concerted efforts to govern the noise problem. As a result of growing industrialization and urbanization, cities throughout North America and Europe became much noisier places. From the late nineteenth to the early twentieth century, most of the complaints about noise came from intellectuals who believed that the cacophony of sounds was an "assault on their mental refinement" (Bijsterveld 2008, 93). Members of the social and cultural elite claimed that the loud cries of street vendors, the whistling of steam trains, and the omnipresent din of urban living was having a detrimental impact on their ability to concentrate and think. Many of these individuals claimed to be "sensitive" to noise and argued that they required peace and quiet to adequately perform their intellectual and artistic tasks (*ibid.*).

Underlying this fight against noise was an overarching narrative of civilization versus barbarism (Bijsterveld 2008; but see also Bailey 1996). Noise was not just an annoyance or nuisance, but was profoundly anti-intellectual and a sign of social and moral decay. In contrast, silence and tranquillity were taken as signs of (high) culture, wisdom, and sophistication. This dichotomy could also be mapped onto the bodies of listeners: For the intellectual elite, being "sensitive" to noise was not a failing or deficiency, but a marker of civility and refinement. Being impervious to noise, on the other hand, implied intellectual weakness and immaturity (Bijsterveld 2001, 45).

The anxiety over noise in the late 1800s was not simply a matter of cities becoming noisier places but what the noise represented and symbolized (see Bijsterveld 2001, 2008). Although factories, trains, and automobiles accounted for much of the increase in noise levels, technology was never blamed as the root

cause of this problem. Quite the opposite, loud sounds that were associated with the virtues of strength, progress, and prosperity were tolerated and viewed in a positive light (Bijsterveld 2001). Yet, the very same sounds were problematized and labelled as “noise” if their presence was deemed unwanted or “out of place” (Douglas 1966). In these instances, the main issue was not the noisiness of technological progress, but the unruliness of human behaviour. The primary solution then was to educate the public about noise etiquette. From teaching drivers to limit the use of their car horns to encouraging street vendors not to yell at night, sonic order was to be maintained by civilizing the masses to employ proper manners and to behave with courtesy and respect (Bijsterveld 2001).²

There were also calls for the creation and enforcement of laws that would prohibit and restrict certain noises. Proponents of this approach often pointed to the unruly nature of sound and its ability to transgress spatial borders to justify the use of legal mechanisms to protect our desire for peace and quiet. These laws, however, were often inadequate. For one, penalties could only be imposed if a judge or government official determined that the noise in question was “generally disturbing,” “unnecessary,” and “intentional” (Bijsterveld 2001, 48). These decisions were totally arbitrary, resulting in uneven and inconsistent enforcement of these regulations. On a more cultural level, the prevailing view of this time period was that the din of industrialization and urbanization was the inevitable and “natural” outcome of technological progress (see Novak 2015, 129–30). Car horns, steam whistles, and sirens were just a normal part of the new modern soundscape. In fact, for many residents, the noisiness and sonic dissonance of the city was attractive and symbolized the vibrancy, vitality, and excitement of urban living.

Noise as “inefficient” and “unnecessary”

Although various noise-abatement societies sprouted throughout North America around the start of the 1900s, they were not always successful at changing public attitudes towards noise. Part of the problem was that these anti-noise groups were often accused of elitism. Using slogans like “Tranquillity is distinguished” certainly did not help to garner public support from working class citizens and labour unions. Since noisiness was associated with masculinity and the need for quiet was seen as a feminine trait, male members of these organizations were commonly mocked for being “unmanly” and portrayed as “non-masculine hysterics” (Bijsterveld 2001, 51). Anti-noise campaigners were also ridiculed for insisting that “refined people” were the true victims of industrialization and urbanization and the most likely to suffer from exposure to noise. To many observers, the demand for greater peace and quiet was just another manifestation of upper-class snobbery.

A second and far more successful wave of the anti-noise movement surfaced in the first half of the 1920s. Unlike the campaigns that existed thirty years prior,

² Some segments of society were more likely to be targets of these interventions than others. In cities in England during the early 1900s, public noise abatement campaigns focused much of their attention on immigrant street musicians rather than the more pressing issue of traffic noise. For Picker (1999), the targeting of these individuals had little to do with their music and was more a function of the overt racism and xenophobia of this time period.

there was a shift in focus away from the harmful effects of noise on the everyday lives of the intellectual and cultural elite. In its place, a new discourse around “productivity” and “efficiency” began to emerge (Dembe 1996). Noise was not only crude and primitive, but was now seen as “inefficient.” Instead of considering noise a symbol of prosperity and progress, anti-noise campaigners sought to connect the noise of machines with waste and the deterioration of technologies. That far from being the “healthy hum” of industrial activity, noise could hinder workers’ efficiency and hurt profits (Hendy 2014, 306).

Noise abatement campaigners turned to research from the field of psychology to prove this point about noise and its negative impact on employee productivity. In New York City, a study conducted by industrial psychologist Donald Laird played a key role in prompting municipal leaders to officially acknowledge and act upon the city’s noise problem (Hendy 2014, 306). Laird’s study looked at the performance of typists in a Manhattan typing pool and compared their speeds and the number of mistakes they made when they were in a quiet versus noisy work environment. The results of his study were quite revealing. The typists were 7% faster when it was quieter. Even more interesting was that the typists used approximately 19% more energy when working under noisy conditions. Laird’s theory was that the extra calories burned was due to the noise causing the typists to involuntarily tighten their stomach muscles “as if they were experiencing a minor form of primal fear reaction” (ibid.).

Anti-noise advocates now had empirical evidence to illustrate noise’s harmful effects on the human body. Julia Barnett Rice, a wealthy Manhattan physician who established the New York City Society for the Suppression of Unnecessary Noise (hereinafter referred to as “the NYC Society”), used these findings to persuade government officials to finally tackle this issue (Hendy 2014). Instead of claiming that noise was a problem that only affected intellectuals, Rice argued that the growing clamour of city life threatened the health and efficiency of *all* residents. By adopting the view that noise harmed everyone, she was able to avoid the charges of elitism and snobbery that plagued earlier noise-abatement campaigns.

Yet Rice was careful in selecting specific kinds of noise that the NYC Society would focus on. This “targeted” approach to governance (Valverde and Mopas 2004) was made explicit in the very name of the organization and its use of the term “unnecessary noise.” Unlike many of the earlier abatement campaigns that tried to limit and control all forms of noise, Rice’s society directed its attention towards noises that were avoidable and could be suppressed through basic changes in human behaviour. Using one’s car horn excessively, listening to a radio at high volumes, and running loud appliances at night are just some examples of the kinds of noises that fell under this category of “unnecessary.”

Another strategy employed by Rice was to highlight the potentially adverse affects of noise on children and the sick (see Hendy 2014; Radovac 2011; Bijsterveld 2008). The NYC Society lobbied for the creation of “silence zones” around schools and hospitals. Once again, Rice employed a discourse of efficiency and argued that the amount of time that teachers spent teaching was drastically reduced when it was noisy outside the classroom (Hendy 2014). Silence was also required around hospitals for health reasons, as noise was believed to hamper a patient’s ability to

recover and heal. Business owners and industrialists had no problem supporting these proposals since the NYC Society was only calling for noise restrictions in specific geographic areas around the city and not a wholesale ban on urban noise.

The intense lobbying by the NYC Society, coupled with an ever-growing number of residents who were increasingly disturbed and frustrated by the ruckus of urban life, prompted New York City to introduce its first citywide anti-noise campaign. Two years later, the city would establish a “Noise Abatement” Commission, which implemented many of the recommendations proposed by Rice and her group. For instance, in 1929, city officials created different zones for housing, businesses, and industry, each with its own set of by-laws and restrictions regarding acceptable noise levels (Hendy 2014, 307). Specific regulations were also introduced stipulating that loudspeaker users remain at least 500 feet away from a school or courthouse during hours of operation and the same distance from hospitals at all times (Sewald 2011). Other novel measures included switching from officers with whistles to using lights as a means to control traffic.

From the Local to the Global: Noise as a Form of “Pollution”

By the 1960s, the noise problem began to shift away from being an urban issue to an environmental one. Increasing noise levels were not just having an impact on the lives of city-dwellers, but were shown to be affecting people, plants, and wildlife, all over the planet. In the North, for example, the roaring of snowmobiles had become ubiquitous and was blamed for the dramatic rise in deafness and hearing loss among Inuit people (Hendy 2014, 310). In the oceans, whales that depend on acoustic sensitivity to communicate with each other were becoming increasingly disoriented and distressed as a result of the sonic effluence from boats (ibid.). These findings led many activists to see noise as another form of pollution that not only causes harm to the environment, but also drowns out the sounds of nature to the brink of extinction (ibid.).

This discourse of “noise as pollution” was also being applied to what was happening in urban centres. In the United States, the *Noise Control Act* was passed in 1972, directing the Environmental Protection Agency (EPA) to identify and regulate major noise sources most detrimental to the public’s health and welfare. The EPA was given the responsibility for setting noise limits for trains, trucks, machines, and other sources of “loud and harmful” sounds. The EPA also had the mandate to require noise labels on goods and products that would enable consumers to compare the loudness of items before making a purchase.

Throughout the 1970s and 1980s, the EPA released pamphlets and public service announcements about sound and noise in cities. The publications reflected a growing anxiety about noise and its effects on public health and wellbeing. Beyond disseminating information about noise and the various physical and psychological harms that excessive exposure can cause, the EPA also established a set of “best practices” to properly address the noise problem. Much of the attention was placed on educating citizens about the risks associated with rising noise levels. The EPA encouraged “quiet-loving citizens” to take responsibility for their noise so as not to offend their neighbours (EPA n.d.). This would involve quieting one’s home with drapes or wall hangings, carpets, acoustic tile, and soft furniture (EPA n.d.).

The Objectivising of Sound: Measuring and Quantifying Noise

Up until the early 1920s, what constituted a “noise”—that is, what level of volume or frequency was needed for a sound to become intolerable—was highly subjective. This would drastically change with the introduction of the “decibel” (dB).³ Sound could now be measured in decibels on a logarithmic scale from 0 to 120 dB.⁴ Since a numeric decibel score has very little meaning on its own, noise charts are often used that map specific decibel levels to examples of commonly recognized sounds as a way for people to gauge how relatively loud something is. For instance, the rustling of leaves typically measures at around 10 dBA, while an average rock concert can reach 120 dBA. Many of these charts also identify the points at which exposure to sound becomes harmful and hazardous.⁵

The invention of tools that could properly measure sound was also vital for noise regulation. With this new technology, municipal officials could now collect quantitative data about noise. The audiometer was the first of these devices to be invented and is often referred to as a “subjective” noise meter since it required the user to listen and compare the sound in question with a reference tone (Bijsterveld 2001, 52). The audiometer simply allowed the person conducting the sound reading to adjust the intensity of the reference tone until it was felt to mask the tone being measured. Acousti-meters—also known as “objective” noise meters—came onto the market later and were comprised of a microphone, an amplifier, and an indicating meter. Instead of requiring the use of the human (and thus imperfect and potentially fallible) ear, the listening to and measurement of sound was now automated and done solely by the instrument. As Bijsterveld (2001, 52) explains, this new technology “made the measurement of loudness a purely physical issue.”

This ability to measure sound has dramatically altered how noise is problematized and regulated. For the first time, a much more objective and quantified approach could be implemented that used numerical decibel limits and comprehensive zoning plans as a way to govern sound (Ross 2014, 14). However, as Valverde (2011) notes, this modernist “way of seeing” (or, in this case, “way of listening”) did not simply replace the pre-modern approaches to urban governance that relied on experiential, embodied, and relational understandings of public nuisance. On the contrary, she writes:

The history of urban governance shows that cities can and do use both modernist and premodernist ways of seeing and techniques of governance,

³ The decibel is used as a measure of the intensity of a sound; that is, the amount of energy that the source of the sound is pushing towards the listener in the form of pressure variations in the air. To be clear, a decibel reading only tells us about a sound’s intensity and is not an objective measure of perceived loudness. Our perception of loudness is highly individual and a subjective psychological phenomenon.

⁴ A variety of modified decibel scales have been developed to address the inherent limitations with the quantification of sound, but the most common and standard form of measurement is the ‘A’ scale (or dBA). The dBA scale uses weighting adjustments to take into account the varying sensitivity of the human ear to different frequencies of sound. In other words, the dBA scale tries to replicate the way the human ear hears (i.e., less sensitive to very low and very high frequencies).

⁵ Researchers have determined that any sound above 85 dBA can cause hearing loss. This impairment and loss of hearing is related to not only the power of the sound, but also the length of exposure. Eight hours of 90 dBA sound can result in injury to one’s ears, while exposure to sounds of 140 dBA will cause immediate damage and physical pain.

acting as if there is no necessary conflict between them... [M]unicipal regulation continues to rely on both subjective offensiveness and objective, general rules, and there is no reason to think that one will drive out the other. It may be ... that “seeing like a city” is precisely a combination of heterogeneous ways of governing that may appear to be contradictory when examined philosophically, but which in practice supplement and/or replace each other without any fanfare. (Valverde 2011, 308)

To this day, many North American cities continue to employ noise abatement strategies that use both qualitative and quantitative techniques. Qualitative noise regulations prohibit particular kinds of noise (e.g., amplified music) or noises that result in specific effects (e.g., noise that is likely to interfere with an individual’s enjoyment of their private property) (Ross 2014, 15). In contrast, quantitative regulations work by limiting noise to specific measurement levels (*ibid.*). As long as it is possible to get an accurate and reliable sound reading, quantitative regulations provide a far more objective and clear-cut approach to restricting noise.

Qualitative restrictions, on the other hand, are much more subjective and embodied in nature. For instance, according to the City of Ottawa’s Noise By-Laws, sounds coming from a “sound reproduction or amplification device” must be kept below a level of 55 dBA between 7 am and 11 pm. Between 11 pm and 7 am, however, any sound that disturbs the “peace and comfort” of a resident or business owner may be considered a violation, regardless of where it reads on a decibel meter. Thus, a person being disturbed in their own home by what they feel is excessive noise is enough to set the provisions of this by-law into action. In fact, the decibel limits placed on noise levels are only activated and enforced when a resident feels compelled enough to register a formal complaint in the first place (Valverde 2011, 302). As Valverde (302) explains, “the modernist knowledge format is secondary: It is parasitic on the antique legal identity of the homeowner quietly enjoying his or her property.”

From the perspective of the city, these qualitative restrictions provide by-law enforcement officers and municipal officials the power to intervene in cases where a noise does not exceed prescribed decibel levels but nevertheless disrupts the enjoyment of a citizen’s home or business. In Ottawa, a resident who is bothered or annoyed by the pounding bass coming from a neighbour’s stereo—a sound that does not register on a decibel reader and is more felt than heard—can still ask an officer to step in on the basis that this sound violates the city’s by-laws that prohibit the making of “unusual noise” and “noise likely to disturb.” Officers can then use their own discretion to determine whether or not the sound is “likely to disturb” and needs to be stopped or turned down. Very rarely are officers ever forced to use the formal legal mechanisms at their disposal; rather, they often turn to the more informal tool of dispute resolution. In the majority of these cases, the issue is less about regulating noise *per se* and more a matter of managing civility and social relations between neighbours.

However, while municipalities have employed both quantitative and qualitative standards to deal with the issue of urban noise, the situation is quite different when it comes to regulating noise generated by industrial wind turbines located in rural settings. Instead of employing a two-pronged abatement strategy, provincial

environmental protection laws have taken a decidedly modernist approach. In the province of Ontario, for instance, wind turbines are subject to quantitative restrictions and are permitted to operate so long as the noises they generate fall under the allowable decibel limits and do not cause serious harm to human health. So, unlike their urban counterparts who can turn to municipal by-laws that use people's self-reported wellbeing as a standard by which "excessive" noise can be judged (see Valverde 2011), rural residents are unable to lodge a complaint based solely on the subjective experience of having their "peace and comfort" disturbed by the noise of the turbines. Instead, these individuals must empirically demonstrate that the noise in question is harmful to their health.

In the section that follows, I document the unsuccessful attempt made by a group of farming families in rural Ontario to challenge a number of proposed wind energy projects slated for development in their respective communities on the grounds that they violate provincial environmental regulations. I begin with a brief overview of a major study conducted by Health Canada in 2012 on the health implications of wind turbines, which played an important role in shaping the broader context of this legal dispute.

Blowing in the Wind? Finding the Link Between Turbines and Health

In July 2012, Health Canada, in collaboration with Statistics Canada and other expert groups, launched a multi-year research project examining the relationship between wind turbine noise levels and health effects on residents living nearby (Health Canada 2014). The study looked at twelve wind turbine developments in Ontario and six in Prince Edward Island and consisted of three parts: 1) an in-person questionnaire which was given to randomly selected participants living at various distances from the wind turbines; 2) a collection of physical health measures that assessed stress levels using hair cortisol, blood pressure, and resting heart rate, as well as measures of sleep quality; and 3) more than 400 hours of wind turbine noise measurements conducted by Health Canada to support calculations of wind turbine noise levels at all homes in the study (*ibid.*).

The results of the study, which Health Canada warned could not be generalized to other communities since the wind turbine locations were not randomly selected from all possible sites operating in Canada, were quite striking. Most notably, researchers found no evidence to support a direct link between exposure to wind turbine noise and any of the self-reported illnesses (e.g., dizziness, tinnitus, migraines) or chronic conditions (e.g., heart disease, high blood pressure, diabetes). However, an association was found between increasing levels of wind turbine noise and individuals reporting to be "very" or "extremely" annoyed. Within this particular field of research, the concept of "annoyance" has a very specific meaning and is commonly used to describe general disturbances caused by noises that cannot be measured or do not exceed prescribed decibel limits (Flynn et al. 1977, 17). Moreover, these "annoying" noises do not pose a direct threat to one's health or wellbeing, but do so *indirectly* by disturbing one's day-to-day functioning and enjoyment of life.

The Health Canada study found a potential link between long-term high annoyance and health effects such as blood pressure, migraines, tinnitus, dizziness, and

perceived stress. Nonetheless, the study is quite clear that no direct *causal* link was found between wind turbine noise and these health effects, noting that these relationships could be explained by other factors outside of noise levels or distance from turbines. It was simply impossible to know whether these self-reported and measured health conditions pre-dated the wind turbines and were thus influenced by pre-existing, confounding variables. Researchers have no easy way of isolating annoyances (triggered by the sound of a wind turbine) to determine whether they are the sole cause of these health problems or attributable to something else.

Lastly, and perhaps most importantly, researchers found the levels of noise caused by the wind turbines under investigation to be below what would be expected to directly affect health, based on the “Community Noise Guidelines” established by the World Health Organization (WHO). Even when measured from a minimum distance of 600 metres, none of the wind turbines produced enough noise to break the prescribed decibel limits. Although the authors of the report were quick to point out that all results are considered preliminary until the work is published in peer-reviewed venues, the study has been taken up by others as conclusive “scientific” evidence that wind turbine noise does not cause harm to people who live nearby.

Farmers vs. Turbines

In 2013 and 2014, the Director of the Ministry of the Environment authorized the construction and operation of three wind turbine generation farm projects: The St. Columban Wind Project, the K2 Wind Project, and the Armow Wind Project. Pursuant to s. 142.1 of Ontario’s *Environmental Protection Act* any person can request the Environmental Review Tribunal (ERT) to hold a hearing to review the decision made by the Director to approve a renewable energy project on the basis that the project might cause “serious harm to human health.” Three families of farmers who lived near the three approved sites demanded an ERT review and, in all three cases, the ERT concluded that the residents had not adequately established that any of these projects would cause serious harm to human health.

At their tribunal hearings, the appellants pointed to research they found online regarding the harms caused by wind noise and to personal testimonies from individuals already living next to a turbine. In a witness statement filed for their ERT hearing, one appellant expressed their concerns about the proposed Armow Wind farm as follows:

Since learning of the project we began doing research on the Internet as well as speaking to other members of our community that have been living in close proximity to wind turbines. We found that there are a number of adverse health effects that have been associated with living in close proximity to wind turbines by a number of people living [in] all different parts of the world. The adverse health effects that are described have been consistent irrespective of location, gender, and age. We are concerned that living in close proximity to this project will likely cause us to suffer severe headaches, tinnitus, insomnia, nausea, and inner ear problems among other issues. (*Dixon v. Director, Ministry of the Environment* 2014, 8)

Appellants also spoke about the uncertainty regarding the impact of this relatively new technology. In an affidavit, one appellant alluded to the potential threat that these turbines may pose:

We believe that the provincial government should not allow “for profit” corporations to endanger the health of Ontario residents, particularly when the adverse health effects are only now being studied by the Federal Government. Many Ontario residents have raised concerns about health effects of wind turbines. The provincial government should only permit the construction of wind farms when it has been established that there are no adverse health effects caused by having wind turbines located so close to occupied homes. (*Dixon v. Director, Ministry of the Environment* 2014, 6)

Thus, both the “supposedly known” and the “yet to be known” harms to their health (and the health of other Ontario residents) were brought into these hearings by the local farmers as evidence of the need to halt these renewable energy projects from moving forward.

Speaking for the Wind-Affected Body: Transforming Subjective Experiences into Objective Evidence

One of the main challenges facing the farmers was that the wind turbines had yet to be built. As a result, they could not rely on their own personal experiences of living next to a wind turbine. Instead, one of the appellants called upon individuals who were living within close proximity to existing wind farms to serve as expert witnesses and provide testimony as to the harmful effects that the noise from these turbines had on their health. Yet, while these four “post-turbine witnesses”—as they were called by the ERT—were allowed to describe how they were personally impacted by wind turbine noise, the Tribunal did not accept this testimony as valid and reliable evidence.

Because the witnesses could not provide medical or scientific evidence demonstrating a clear causal connection between exposure to wind turbine noise and the various physical, psychological, and physiological ailments they claimed to be experiencing, their personal accounts were simply characterized by the Tribunal as “anecdotal self-diagnosis.” This self-reported evidence carried little weight without a medical doctor certifying these claims. The lawyers representing the province brought in doctors and scientists who testified that the post-turbine witnesses needed to be properly diagnosed by a medical professional before their testimony could be accepted as “fact.” In *Kroepflin v. the Director, Ministry of the Environment* (2014, 39), the respondents called upon Dr. Kenneth Mundt, an epidemiologist, who gave evidence that self-reported health problems do not constitute valid epidemiological assessments and that “causal conclusions based on self-reported health problems are scientifically speculative and likely misleading.” Thus, in stark contrast to the detached and objectivizing medical gaze of a trained physician, the post-turbine witnesses’ personal accounts and readings of their own bodies were said to be unscientific, unreliable, and not to be trusted.

The expert witnesses called upon by the government were also permitted to review and cross-examine the evidence of the post-turbine witnesses, which included their medical records and witness statements. Consequently, the government

experts were able to offer up a scientific evaluation of these materials that would trump the “anecdotal self-diagnoses” of the post-turbine witnesses. In the *Kroeplin* case (2014), one of the government’s experts—Dr. Robert McCunney, a medical doctor specializing in occupational and environmental medicine with expertise in the health implications of noise exposure—stated that the level of information provided in the medical records was insufficient to allow a medical practitioner to make definitive causal assessments between diagnoses, symptoms, and wind turbines. So, instead of using the medical records to deny or present a counter-narrative of the post-turbine witnesses’ experiences, the expert argued that there was simply not enough data available to say with any degree of certainty that these conditions and symptoms were due to exposure to wind turbine noise and not some other cause.

In all three cases, the ERT accepted the position of the Ontario government’s experts that there was no evidence to prove that wind turbine noise causes serious harm to people. The noise levels measured at the homes of residents living in close proximity to a wind turbine were typically below 40 dBA and therefore not expected to have any adverse effects. All of these experts also agreed that the current setbacks in decibel limits required by legislation were adequate at protecting the public and, so long as these projects operated in accordance with the protocols set out in the Renewable Energy Approval (REA), no serious harm would be caused to human health.

The Appellants would later appeal the ERT’s decision to the Ontario Divisional Court (*Dixon v. the Director, Ministry of the Environment* 2014). The farmers involved in these cases argued that the ERT should have struck down as unconstitutional the test set out in the REA hearing provisions of the EPA as too strict and therefore contrary to section 7 of the *Canadian Charter of Rights and Freedoms* or, alternatively, should have read the test down as only requiring a “reasonable prospect of serious harm to human health.” They also argued that the ERT erred in law by ruling that, in order to demonstrate serious harm to human health, it was necessary for the Appellants to call evidence from a qualified medical expert.

The Divisional Court denied the farmers’ appeal. On the first issue, the Court rejected the appellants’ arguments that their s. 7 *Charter* rights had been violated by claiming that the language used in the EPA—in particular, the reference to “serious harm to health”—was not too onerous and “closely tracked the jurisprudential requirement” that a claimant demonstrate “serious” harm in order to establish a s. 7 *Charter* violation of security of the person (*Dixon v. Director, Ministry of the Environment* 2014, 16). With regard to the issue of whether “serious harm to human health” can be proven without a medical expert, the Court dismissed the appellants’ argument that the ERT erred in treating the testimony of post-turbine witnesses as incapable of proving serious harm. The Court noted that the ERT assessed this testimony in light of the medical evidence from the respondents’ experts and came to the conclusion that the conditions and symptoms experienced by these witnesses could not be causally connected to exposure to wind turbine noise. In making this determination, the Court also referred to Health Canada’s study on wind turbine noise discussed earlier. In particular, the Court made direct reference to the study’s main finding that no definitive link could be made between wind turbine noise and human health.

In 2015, the appellants sought leave to appeal to the Ontario Court of Appeal, but the Court refused to hear their cases. Once again, the farmers involved in this dispute wanted the courts to lower the standard to a “reasonable prospect” of serious harm to health which would be much easier to prove. They also wanted the appeal court to look closely at the Health Canada study and its findings regarding the correlation between annoyance and exposure to wind turbine noise, and to consider this in light of other empirical research suggesting links between long-term feelings of annoyance and health issues such as dizziness and high blood pressure. On this point, Julian Falconer, the lawyer representing several of the farm families, argued that whether harm is direct or indirect is irrelevant. At trial, he explained that, “The nightmare neighbour can split your eardrums or he can drive you crazy, but either way you end up with serious health effects” (Fine 2014). Rather than using its colloquial meaning as a simple irritation or nuisance, Falconer demanded that regulators consider “annoyance” to be a very real concern and a form of psychological stress beyond the everyday, and which the government has no right to impose through their support and approval of these wind energy projects (*ibid.*).

Lawyers representing the government, on the other hand, held a very different view of “annoyance” and argued that it should not be used as evidence of harm to human health. Standing before the three-judge panel of the Ontario Divisional Court, a government lawyer explained, “Subjective feelings of annoyance are not to be trusted.... If you don’t like the source, you’re more likely to find the noise annoying.” In making this claim, the lawyer for the Ontario government is suggesting that, while it is possible to evaluate the impact of wind turbine noise on one’s health, self-reports provided by those who have a personal stake in the future of a wind energy project should not be accepted or trusted as “fact” as these individuals are incapable of being objective in their assessments.

Correlation is not Causation: Noise, Annoyance, and Harm to Human Health

In Ontario, the ERT has set the bar quite high for anyone wishing to challenge the approval of a wind energy project because of the noise they produce. Industrial wind farms are governed provincially through the *Environmental Protection Act* and, unlike municipal noise by-laws, which are primarily aimed at controlling and limiting community noise levels, this piece of legislation is concerned with ensuring that renewable energy projects are not in any way harmful to the public at large, among other things. As a result, the parameters for how the effects of noise are measured and assessed are much more narrowly defined. It is not enough to demonstrate that wind turbine noise can cause people to experience feelings of annoyance, which can then lead to things like headaches or sleep problems. On the contrary, complainants must show a *direct causal* connection between exposure to wind turbine noise and “serious harm to human health.”

Yet, as any undergraduate student who has taken a research methods course would know, proving a non-spurious, causal relationship between two variables is no small feat and, in most cases, is next to impossible. Even if a correlation between wind turbines and adverse health effects can be substantiated empirically, detractors can always point to a variety of external or pre-existing factors—known or unknown—that could

have caused these harms. In fact, this was the very argument used by government lawyers to dismiss the self-reported health problems of the post-turbine witnesses. As Danielle Meuleman, one of the lawyers representing the Ontario Environment Ministry explained, “even if sleep or heart problems start at the same time a turbine is installed, the problems may have other causes” (cited in Fine 2014).

The other issue at play here is that the wind turbines in question have yet to be built. The complainants therefore have no direct, first-hand experience of living in close proximity to one of these projects. Consequently, any claims that they make about the harms caused by wind turbine noise are going to be speculative in nature. In fact, given the high standard set by the ERT, complainants would actually need to live next to a wind turbine for an extended period of time and develop some form of illness in order to show that they do cause harm. This absurdity was not lost on one of the complainants, Shawn Drennan, who said in a public statement, “We are being told that we have to wait to be harmed before we can do anything to stop [wind farms]. The court has given us two choices: Leave the land my family has farmed for three generations or be a guinea pig for the government and the wind companies” (Perkel 2018).

Perhaps not surprisingly, rural residents have looked for solutions outside of law and begun organizing politically to protest and lobby against the development of these wind energy projects. Like many of the noise-abatement campaigns of the past, a number of these grassroots organizations have taken aim at gathering more empirical research on both the direct and indirect harms caused by wind turbine noise and educating the general public about this topic. Another key strategy has been to collect and share personal testimonies—both in print and video form—from affected citizens as a way to generate public awareness and sympathy for this cause. For example, on the Ontario Wind Resistance website (ontario-wind-resistance.org) the blurb that sits atop the “More Testimonies” page reads:

As expert opinions volley back and forth about adverse health effects from industrial wind turbines, families in this province continue to suffer illness from exposure to turbine installations. This provincial government, alongside the wind industry, continue to fight the people of this province. But people living in turbine installations know what has happened to them. They know they were fine until the wind turbines moved in next to them. They have come to know that their health and safe home is second to industry.

Likely aware that the current data about wind noise is not on their side, anti-wind turbine groups have tried to appeal to people’s emotions as a way to get their subjective experiences of being harmed, disturbed, and annoyed acknowledged and recognized by others as very “real” concerns. The telling of these personal, emotionally-filled stories about their day-to-day dealings with wind turbine noise is one way for these organizations to transform citizens who have no direct experience with wind turbines into “sympathetic listeners”: listeners who can vicariously sense and feel the effects of wind turbine noise in the same way they do and who can then be recruited and called upon to join in their struggle.

Putting Noise in Its Place

In order to fully appreciate and better understand the current controversy surrounding wind turbine noise and how it can be governed, it is important to situate

this debate within the broader social, cultural, and political contexts in which it is taking place. Along these lines, it is also vital that we take into account where these noises are experienced and by whom. Indeed, this case is quite unique in that it involves rural farmers and their attempts to control and regulate the sounds heard in the country.

What has been written about this subject has primarily focused on the transformation of the rural soundscapes of Europe and North America caused by the Industrial Revolution (see, for example, Marx 1964; Bijsterveld 2008). The orthodox narrative that is commonly presented is one in which the peace and serenity of the country is penetrated and disrupted by the sounds of steam engines, factories, and urban life (Smith 2012, 41). Yet, while the quietude of the “pastoral ideal” (Marx 1964) continued to serve as an escape from the racket of modernity, the noises of early industrialization and urbanization were eventually accepted and tolerated—particularly by workers—as sounds of freedom and economic progress (Smith 2012, 41). Although being careful not to imply an overly social-determined account of this aural history, Smith (2012) suggests that rising industrialism and capitalism played a key role in shaping how people during this time period experienced and interpreted these sounds.

Interesting parallels can be drawn to the current debates surrounding wind turbines. Like the steam engines and factories that emerged during industrialization, wind turbines are imbued with a set of cultural meanings that shape how we deal with the noise they generate. To proponents of wind power, wind turbines symbolize technological progress and the move towards clean, green, renewable energy. The noise produced by wind turbines can therefore be rationalized and explained away as a necessary evil or an unavoidable by-product in the march towards a cleaner, healthier, and safer environment. This, in turn, makes opposition to wind turbines and the noise they produce that much more difficult, especially when the noise in question falls within the generally accepted decibel limits. More broadly, given the growing concerns regarding climate change and our over-dependence on fossil fuels, any type of opposition to wind energy can be (mis)construed and (mis)labelled as being “anti-environmental.”

Because rural residents are often stereotyped as being politically conservative and less likely to support “green” initiatives, it is easy for critics to ignore or dismiss their concerns about the effects of wind turbine noise as either being unfounded or simply a reflection of their personal dislike for these sorts of projects. In response, we have seen a number of anti-wind organizations working to reframe how they are represented and the narratives concerning their opposition to the development of wind turbines. For example, an advocacy organization called Wind Concerns Ontario (WCO) claims that its mission is to “protect the health, safety and quality of life of the people of Ontario from Industrial wind turbines.” The “About Us” section on the WCO website (windconcernsontario.ca) goes on to explain that the group

supports responsible, environmentally sound solutions to our energy demands and environmental challenges. However, the plan supported by the *Green Energy Act* ... is tearing apart the very fabric of rural Ontario. Along with transformers, transmission lines, overhead distribution wires

and substations these industrial wind turbines threaten people and the environment in serene, historic, rural communities, on prime agricultural land, migratory bird paths and close to sensitive wetlands, designated wildlife areas and pristine shorelines.

By using the imagery of peaceful agricultural landscapes built upon fertile soil and filled with active wildlife being invaded by power lines and other forms of industrial technology, the WCO is challenging the stereotypes of rural Ontarians as somehow unaware or unconcerned about the environment by branding itself as stewards and protectors of “nature” against the destructiveness of industry. Rather than seeing it as a way to produce clean and renewable energy, the WCO lumps wind projects in with all other commercial industries that manage to do harm to people and the environment.

Viewed in this light, the noise generated by wind turbines can also be reimagined as a form of pollution and likened to many of the other harmful side-effects linked to large-scale energy production. On the connection between noise and technology and its impact on nature, Novak (2015, 129) writes:

noise is usually understood as a technologically produced field of sound, which is superimposed on a natural or social environment. In ecological terms, noise is “pollution” that degrades the sonic balance of nature. But before its harmful subliminal effects can be corrected, noise must first be located and brought back into human consciousness from its ubiquitous but subliminal position in the modern soundscape.

One way for anti-wind activists to bring their concerns over noise “into human consciousness” is by convincing others to view wind turbines not as a solution, but a main source of environmental pollution.

Of course, it is also important that we take into account the underlying political and economic interests that are at play here. The fight over wind-turbine noise often pits the concerns of rural residents and farmers against those of government and private industry. That government regulators would demand objective evidence linking noise with harm to human health before taking any action is not at all surprising given the size and scale of these projects and the amount of public and private money that is being invested. Indeed, the story to date could easily be read as one in which the economic and environmental benefits of wind power override the health, wellbeing, and quality of life of local citizens. Yet, while we certainly cannot dismiss the influence of big business and corporate power, to explain this as just another example of governments choosing “profits over people” is overly reductionist and would ignore much of the complexity and nuance surrounding the controversy over wind turbine noise that has been presented above. Indeed, as I have demonstrated, how we problematize and govern noise is never a straightforward process and is always contingent upon the broader circumstances of their production and reception.

Conclusion

As I have shown in this paper, there is nothing universal or inherent in a sound that makes it “noisy.” Noise is not a distinct ontological category of sound that can be objectively defined and measured, but an epistemological phenomenon that is

the end result of how these sounds are observed, arranged, and categorized. A sound must be interpreted as a noise and given this label by listeners who, in turn, rely on their own experiences and sensibilities to help make this determination. What we consider to be noise is therefore highly subjective and largely dependent on who is listening, who or what is producing the sound in question, and the broader social, political, cultural, and technological contexts in which this sonic interaction takes place.

The fact that we all hear and sense our surroundings differently makes governing noise particularly challenging. Since the late 1800s, we have seen various grassroots movements emerge that have tried to turn specific noises into matters of public concern requiring some form of state intervention, all with varying degrees of success. Because we do not all agree as to which sounds are loud, unpleasant, unwanted, or out of place, abatement campaigns often turn into political and legal contests that pit complainants in direct opposition to the alleged “noise makers” and their defenders. These contests are not simply empirical debates as to what sounds do or how they are sensed and experienced, but are also battles over what they represent and symbolize.

Whether it is framed as an issue of efficiency and productivity, a form of pollution, or something that may cause serious harm to human health, the way that noise is regulated and how governments intervene (if at all) is largely informed by how it is problematized. Nevertheless, it is important to recognize that these processes of governing do not operate within a vacuum. As I have demonstrated in this paper, the regulatory systems and legal frameworks in place not only define what noises are prohibited, but also help to determine how their impacts are to be assessed and evaluated and, relatedly, what counts as evidence or proof of a violation.

In this paper, I have drawn comparisons between how noise has been governed in urban and rural settings to illustrate the different standards that are used to determine when governments can or should intervene. Whereas most municipalities have by-laws that employ both quantitative and qualitative standards to deal with the problem of urban noise, the noise generated by industrial wind turbines that primarily affects rural residents falls under the purview of provincial environmental protection legislation, which takes a decidedly modernist approach. In stark contrast to municipal by-laws that use people’s subjective experience of being disturbed as a benchmark by which “excessive” noise can be judged, rural residents have been given the impossible task of having to demonstrate a clear causal connection between their exposure to wind turbine noise and harm to human health. Not surprisingly, rural residents have taken various extra-legal steps to politicize and draw public attention to how they are being negatively impacted by the noise of these turbines.

As this paper has demonstrated, the conflicts over noise are varied and constantly evolving with larger social, cultural, political and technological change. These conflicts provide us with an interesting site for critically examining how sounds are sensed and experienced, the ways in which these sounds are problematized and transformed into legal categories, and the various processes by which we regulate our shared soundscapes. Ultimately, how noise is governed has just as much to do with the actors embroiled in these disputes and the wider settings in which these clashes happen as the noise itself.

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