EXPLORING AND EXPLAINING PARTICIPATION IN LOCAL OPPOSITION: BROWN COAL MINING IN HORNÍ JIŘETÍN

REVISED AND EXPANDED SECOND EDITION

Filip Černoch, Lukáš Lehotský, Petr Ocelík, Jan Osička

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PREFACE

This second edition of the book summarizes a three-year research project on local opposition to coal mining in the Northwestern part of the Czech Republic. The research focused on the relational dimensions of the opposition movement and the political context in which the movement operates. Funding for this project was awarded by the Czech Science Foundation to Masaryk University for the years 2017-2019 (project No. 17-08554Y). The research yielded five peer-reviewed articles that introduced the historical and political context of coal mining in the country (Černoch & Lehotský, 2019), explored the media discourse around coal in the Czech Republic (Lehotský, 2018; Lehotský, Černoch, Osička, & Ocelík, 2019) and around its future in the wider Central European region (Osička et al., 2020), and explored the opposition network attributes (Ocelík, Lehotský, & Černoch, 2021) as well as the perspectives and discursive positions of the opposition's representatives (Černoch et al., 2019). The following text builds on these articles and expands them.

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SECTION 1

INTRODUCTION

The ever-growing complexity of modern societies has been accompanied by increasing conflicting interests of different social actors. The phenomenon of local opposition, in which local communities oppose local development proposals of various kinds, starting with toxic storages and ending with shopping malls and parks, represents one example of such conflicts. In this book, we present the results of a three-year research project on local opposition towards coal mining in the Northwestern part of the Czech Republic.

There are three main reasons why this research is so relevant at this time. First, there is a substantive dimension of the issue. Better public planning policies (i.e., policies that are more capable of adequately accommodating interested parties and eventually resolving the conflict) depend on better understandings of the phenomenon. Second, there is a normative dimension. Civic participation and deliberation of public issues are cornerstones of liberal democratic societies. Studying this phenomenon can show us what the limits and possibilities of public engagement are in a given context. The autonomy of the academic sphere and independent funding of research are crucial for avoiding conflicts of interests in such an important issue. In this respect, we argue that academic research has an irreplaceable role. Third, there is a theoretical or research-oriented dimension. Research on local opposition is embedded within a broader research agenda concerning the research of collective action more generally (Siegel, 2009), and in our case also research of framing processes (Futrell, 2003), social networks (Tindall et al., 2012), and social movements (Diani & McAdam, 2003).

Local opposition as a complex phenomenon can be studied from various perspectives – be it a stakeholder analysis, local community engagement, environmental justice, or collective and individual participation. In the research presented in this book, we have narrowed down the focus to individual participation in local opposition. In other words, we looked for the factors behind individual decisions to become engaged in collective action, specifically local opposition, and to sustain this commitment over time (Della Porta & Diani, 2006). We argue that a better account of individual participation is crucial for a fuller explanation of the emergence and persistence of local opposition. Socio-geographically, the research focuses on the case of Horní Jiřetín, a town in the Ústí nad Labem region of Czech Republic, which is considered one of the most important instances of local opposition in the Czech Republic in public discourse and has been extensively discussed at the executive level (Mládek, 2015; Sobotka, 2015; Zeman, 2015). In addition to the completion of the Temelín Nuclear Power Plant (NPP) and the Dukovany NPP, the question of modifying or expanding the "Territorial Limits" of brown-coal mining is arguably the most important energy issue in the Czech Republic (Osička et al., 2019).

Our approach towards the issue diverges from the rational-choice-inspired "Not In My Back Yard" (NIMBY) perspective on local opposition which had held sway until recently. Building on current discussion (Burningham et al., 2006; Devine-Wright, 2007, 2013; Futrell, 2003; Tindall et al., 2012), we bring in structural (or more precisely microstructural) and discursive sources of explanation. As such, the ambition of this book is to explore the factors that drive individual participation in local opposition as well as to explain the interactions of these factors and their contributions to civic participation (and consequently emergence of local opposition). Furthermore, we seek to show to what extent these structural and discursive factors contribute to participation in the given case.

The specific main research questions derived from the highlighted objectives of the research are as following:

1) What individual, discursive, and structural characteristics are associated with individual participation in local opposition?
2) What individual, discursive, and structural characteristics contribute to individual participation in local opposition?
3) What is the political context in which this local opposition operates?

The book summarizes a three-year research project on local opposition to coal mining in the Northwestern part of the Czech Republic. The research focused on the relational dimensions of the opposition movement and the political context in which the movement operates. Funding for this project was awarded by the Czech Science Foundation to Masaryk University for the years 2017-2019 (Project No. 17-08554Y).

The research yielded five peer-reviewed articles and contributed to one doctoral dissertation that introduced the historical and political context of coal mining in the country (Černoch & Lehotský, 2019), explored the media discourse around coal in the Czech Republic (Lehotský, 2018; Lehotský et al., 2019) and around its future in the wider Central European region (Osička et al., 2020), and investigated the opposition network attributes (Ocelík et al., 2021) as well as the perspectives and discursive positions of the opposition's representatives (Černoch et al., 2019).

The book is structured in the following manner. In Section 2, we present the historical development of the coal mining industry in Czechoslovakia and the Czech Republic, and discuss the main political issues associated with it. Section

3 completes the contextual overview by introducing the media discourse on coal in the country. Section 4 introduces the theoretical and analytical background of the relational approach and presents the results of a social network analysis and a frame analysis of the opposition. Finally, Section 5 summarizes the findings of the research and raises some policy implications.

The book is a second, expanded edition of our commented summary on the research findings. In this edition we have added a thorough elaboration on the social network analysis methodology (Section 4). The book now presents a comprehensive guide to the building blocks of the method as well as useful tools for reading research inspired by social network analysis. We have also added a discussion of the most recent developments in Czech energy politics (Section 2). We reflect on (a) the ongoing efforts to establish a legal and economic framework for the expansion of nuclear power—an issue that the Czech decision makers tend to connect closely with the eventual coal phase-out and which has become more and more controversial over time; (b) the establishment and outcomes of the country's "Coal Commission", which, following the German example, recommended a complete abandonment of the use of coal by 2038; and (c) the cross-border conflict with Poland over the Turów coal mine operations, which directly endangers the environment in the area.

SECTION 2

THE CZECH COAL MINING SECTOR, ITS ISSUES, AND PERSPECTIVES

The goal of this section is to provide a short overview of the history of the Czech brown-coal mining sector. First, we examine how intense industrial activities in the Northern Bohemia region affected, and continue to affect, the socioeconomic position of local residents. Second, we give a great deal of attention to the issue of the "Territorial Limits" for coal mining, which were established in 1991 to prevent any further destruction of this beleaguered area. Third, we briefly discuss the activities of the Czech Coal Commission, which was established in 2019 to decide when and how coal usage should be terminated in the country. Finally, we provide regional context, commenting briefly on the situation in Poland and German.

In this section, we use an expanded and updated version of the article "Czech Republic can't decide its position over coal" (Černoch & Lehotský, 2019).[1]

[1] The text is used with the kind permission of the journal *Coal International*.

The history of the Czech coal-mining sector

Two important periods are presented in this section: the era of the Socialist regime, when coal mining in the region reached its height; and the era of modern Czech Republic, characterized by a slow phasing out of coal mining. Based on this introduction, the section moves on to a discussion of the position of local communities with an emphasis on social and environmental justice.

From WWII to the Velvet Revolution

While the first half of the 20th Century witnessed a gradual transformation of the Czech lands from an agrarian to an industrial state, accelerated by the experiences of the two world wars, it was the Communists' emphasis on extensive industrialization, a preference for heavy industry, the redistribution of production in the Council for Mutual Economic Assistance (COMECON), as well as stable population growth that drove an unprecedented surge in coal consumption in Czechoslovakia (see Table 1).

Coal production surged with low-quality brown coal replacing hard coal as a primary energy source. Until the 1980s, the energy consumption of the country increased at a steady rate of 3% per year, accompanied by costs the toll of increased pollution and the sacrifice of agricultural land for mining (Kuskova et al., 2008).

Table 1 – Industrialization in Bohemia (1850-1910) and Czechoslovakia (1950-2000, without Slovakia after 1993) (Kuskova et al., 2008).

Indicator	Unit	1850	1880	1910	1950	1985	2000
Population density[a]	[cap/km^2]	92	111	135	95	121	123
GDP/cap[b]	[USD/cap]	1079	1334	1990	3501	8367	8630
Domestic energy consumption per capita	[GJ/cap]	39	59	78	121	283	207
Share of biomass in domestic energy consumption	[%]	94	64	51	39	20	18
Agricultural population[c]	[%]	59	49	38	20	12	8
Coal extraction[a]	[t/cap]	0.1	1.3	2.9	3.5	8.3	4.6
Iron production[d]	[kg/cap]	8	13	81	252	975	635

Vlček et al. distinguished among four periods of the development of the coal sector in Czechoslovakia after the Second World War. During the first period of 1945-1950, the disorganized and underfinanced sector was nationalized by the 'Decree of the President concerning the Nationalization of Mines and some Industrial Enterprises' No. 100/1945 together with other mining and energy companies, iron and steel works, and foundries; altogether, 2462 companies were brought under state control (Vlček et al., 2012).

The second period of 1950-1960 was typified by an emphasis on rapid and extensive industrialization, with the increasing demand for energy covered almost exclusively by coal. Modern coal power plants were also built in this era, including Hodonín, Poříčí II, Opatovice I, Tisová, and Mělník.

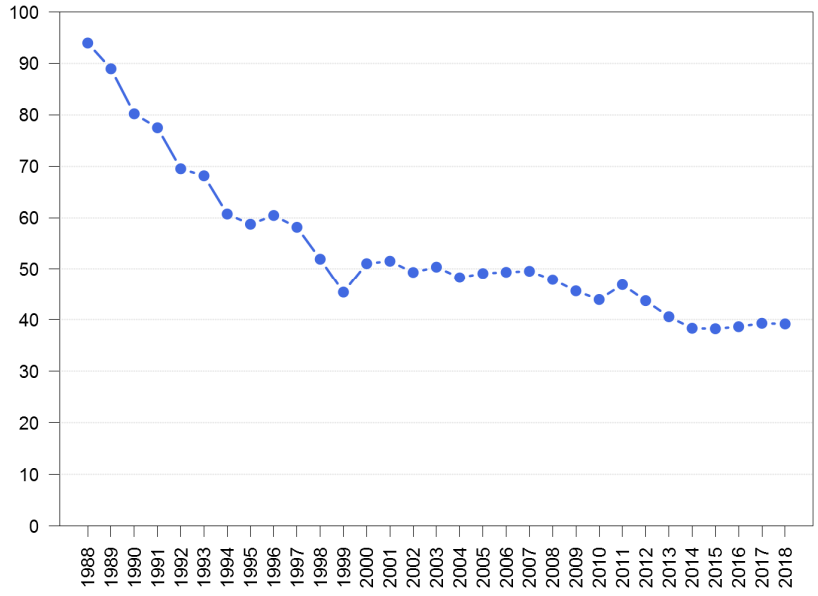
Not even seemingly endless coal deposits of the Czechoslovakia were able to satisfy the needs of the economy, and thus diversification processes were launched in the third period, of 1960-1980. Crude oil and its products as well as natural gas supplemented coal in industrial and chemical processes, transportation, and district and household heating. As a result, coal was redirected to the power sector, to industrial heating, and to the production of coke. The relative lack of energy also incentivized some rationing of consumption, with increasing emphasis on energy efficiency and savings. The commissioning of the Tisová, Tušimice I and II, Prunéřov I and II, Ledvice, Počerady I and II, Mělník II and III, Dětmarovice, and Chvaletice plants also closed out the era of new coal-fired power plant construction in the country. Since then, the only coal-fired plant to complement this ensemble was the rather small Ledvice power plant, commissioned in 2017.

In the first half of the 1980s, during the fourth period of 1980-1990, coal production in the Czechoslovakia peaked. The rest of the decade, however, witnessed a slow decline, which would only accelerate again in the 1990s. The decreasing quality of coal from gradually depleted deposits was compensated by new nuclear sources, while the experiences of oil crises in 1973-1974 and again in 1979 spurred energy efficiency in industry.

Coal in a liberalized economy

Over the course of transformation of the Czech economy since the Velvet Revolution, the coal sector has changed dramatically. The previous emphasis on (unprofitable) heavy industry was abandoned; market principles called for the efficient use of fuels and other means of production, and society started to question the environmentally terrifying way that resources were extracted in the country. As a result, brown-coal production dropped dramatically between 1989 to 2000 (see Figure 1); from 88.9 million tons to 51.0 million tons, respectively (Zavoral, 2019). The inevitable restructuring of the sector was accompanied by significant financial involvement of the state in the form of social programs for superfluous workers.

Figure 1 – Brown coal production in the Czech Republic, million tons (Zavoral, 2019)



In line with the general emphasis on the privatization of state-owned capital, the mining industry's largest enterprises, specifically Mostecká uhelná (now Sev.en),

Sokolovská uhelná, and Severočeské doly, also passed into private ownership. However, the extremely controversial way this transformation took place immediately compromised the reputation of these (newly private) companies, and even their employees came to distrust both the state and the owners (Černoch, 2019).

The privatization of Mostecká uhelná is an especially concerning case. During a series of unclear financial transactions between undisclosed investors, the government involuntarily lost control over this Czech brown coal company to high-ranking members of its former management. The following court cases, which extended all the way to Switzerland and its local courts (since money from the transactions was deposited there) have continued even today, with limited chances for a transparent and final resolution. The situation of the Sokolovská uhelná is only slightly better. Although the government was able to defend its ownership in the 1990s, Sokolovská uhelná was sold in 2004 to the management of the company for the widely criticized price of 2.6 billion Czech crowns. For comparison, at the same time, an American company (Independent Power) offered over 6 billion crowns, and a Slovak company (Penta) even offered over 7 billion crowns; both companies were, surprisingly and without detailed justification, eliminated by the selection commission from the tender. The last of the enterprises, Severočeské doly, was expected to be sold during an open tender, which had attracted the previously mentioned Penta, as well as The Appian Group and J&T. After the decision of the government to cancel the tender, the mines were ultimately sold directly to the state-owned utility, ČEZ (Černoch, 2019).

Privatized companies faced multiple challenges in the new century. Gradually suppressed by the combination of national and EU climate and environmental policies, exposure to growing skepticism from society, and depletion of reserves, especially due to the Territorial Limits on Mining (see following sections), owners have fought for every piece of the energy market to survive. Revised scenarios of the 2015 State Energy Concept have projected coal to decrease in

importance, with its share decreasing from 52.4% of Czech energy-resource consumption to a mere 11-17% in 2040 (Vlček et al., 2019). Unless major changes in the country's energy strategy emerge, such as the complete rescinding of the Territorial Limits on the Bílina or the Czechoslovak Army (ČSA) mine, the illustrious days of coal domination will gradually come to a close.

The impact of mining on the local population

From the perspective of Northern Bohemia, the abundance of this precious mineral has always been both a blessing and a curse. During the Industrial Revolution, coal provided the region with income and jobs, however poor, dangerous, and thankless. With the growing industrialization of the Austrian-Hungarian Empire, this area became one of the pillars of its economy. It was the post-WWII Socialist regime, however, that really changed the situation of the local people *en masse* and interconnected their future with the future of coal mining.

Everything became subordinated to the ever-increasing and uninterrupted flow of coal to industry, with Czechoslovakia seen as the "forge of the socialist camp'" (Říha et al., 2011). In line with the emphasis of the communist ideology on "the common worker," workers in industry were provided with above-standard wages, work-related privileges, early pensions, and social appreciation. But there was also a price to pay. Over 100 municipalities were swallowed up to make room for the continuous mining; over 90,000 people were relocated (Frantál & Nováková, 2014). Even the royal city of Most needed to move. The social fabric of the area was compromised due to the lack of diversity in working opportunities, education, culture, with the consequence of an above-average concentration of people with only a basic education, uneducated people, and ethnic minorities, as well as above-average levels of alcoholism, crime, homelessness, and other negative social issues (Frantál & Nováková, 2014).

The exclusive focus on the coal industry compromised the ability of the region to overcome the structural changes that came after the Velvet Revolution. The drop in production was accompanied with the loss of prestige of the mining professions (and heavy industry as a whole), the flow of money to the local

economy subsided, and the underdeveloped educational and business infrastructure was unable to provide a future for the locals. Despite the commissioning of the Temelín Nuclear Power Plant, the production of coal-produced electricity for the Czech Republic's extremely lucrative electricity-export market has continued, a callous form of landscape commodification and social and environmental injustice. In an analysis of the impact of coal production on these trends in affected areas Frantál and Nováková, using data from 2011, identified a significant association between coal energy production and various population vitality and health indicators, including higher rates of abortions, higher infant mortality, and lower male life expectancy. When they turned to economic indicators, they also found lower employment levels (Frantál & Nováková, 2014). It is obvious that the benefits of coal mining for local people, such as higher earnings for mining workers and higher pensions, have been more than offset by the impact on the regional environment and the society.

The Territorial Limits on Brown-coal Mining in the Northern Bohemia

Massive industrialization powered by brown coal wrought large-scale environmental damage in the region of Northern Bohemia. In 1991, the Czech government passed Resolution 444, which introduced the Territorial Limits on Opencast Mining of Brown Coal in Northern Bohemia (henceforth "The Limits"); these were boundaries intended to restrict mining activities and facilitate a coal phase-out. The idea was that the energy industry, provided with about two decades of expected mining, would undergo a coal phase-out by the time the Limits were reached.

Table 2 – Reserves at the most impacted mining sites (Melichar et al., 2012)

Mine	Reserves outside of the Limits (MT)	Company	Estimated phase-out with/without the Limits
Czechoslovak Army	773	Sev.en	2023/beyond 2050
Bílina	100	Severočeské doly	2021/2049

Multiple structural factors, however, undermined these expectations, ultimately turning the Limits into a political battlefield for years to come. The Limits were only established in the form of a governmental resolution, and since the reserves were never legally designated inaccessible by a stronger form of legislation, any new government could repeal them at any time. The wording of these resolutions was also not clear enough, allowing for an interpretation that the Limits would be valid for 15 years after their introduction. With nine hundred million metric tons outside of the Limits at the ČSA mine alone, this coal represents a high-quality, easily accessible, and extremely lucrative asset (see Table 2), located in

an area in which all the necessary infrastructure for further mining operations is still available. Since privatization of the industry had yet to come, immediately after the Velvet Revolution the state initiated costly investments in the modernization, desulfurization, and denitrification of the power plants, strengthening the path dependency of the sector. Finally, the Limits were established in a country with a government that had emphasized the security benefits of utilizing domestic sources, and the importance of coal for affordable prices for heat and electricity.

Conflict over the Limits

Considering the above-mentioned factors, conflict about the Limits was virtually unavoidable. Even at the beginning of the 1990s, the coal industry started to emphasize the importance of the restricted brown-coal sources for stable and accessible supplies of electricity and heat. This in turn mobilized opposition against any further mining in the area; ever since, these two conflicting camps have been locked in a dispute about the future of brown coal in the country.

The first serious debate on the governmental level was opened by the Ministry of Industry and Trade (MIT), which included a requirement for a "rational reassessment of the brown-coal mining Limits" in the State Energy Policy of 2004 (Ministry of Industry and Trade, 2004b), but which nevertheless had no direct impact on the legal force of the resolution. The Limits were back on the agenda in 2007-2008, with the MIT proposing their partial rescission at the Bílina mine. The government rejected the proposal and upheld the status quo by issuing a new governmental resolution in 2008. The decree reaffirmed the Limits at the ČSA mine, while only slightly adjusting the Limit line of the Bílina mine (*USNESENÍ VLÁDY ČESKÉ REPUBLIKY Ze Dne 10. Září 2008 č. 1176 k Územně Ekologickým Limitům Těžby Hnědého Uhlí v Severočeské Hnědouhelné*

Pánvi, 2008). The subsequent government also pledged to preserve the status quo. However, in 2011, the MIT attempted to update the State Energy Policy of 2004 in such way that revoking the Limits would have been necessary. The pretext was the expected shortage of domestic coal for heat generation (Sacher, 2011). This was in contrast to a previous pledge by the government, and was rejected after the plan was leaked to the public (Greenpeace, 2011).

The decision to deal with the Limits was reopened during the caretaker government of Jiří Rusnok at the wishes of a significant opponent of those Limits: Czech President Miloš Zeman, who cited social reasons and the importance of the country's energy independence (Czech Press Agency, 2013; Kopecký, 2013). Rusnok's motion did not receive any vote of support in the Chamber of Deputies since his caretaker government had no political mandate. On top of that, the government was in a lame-duck session at that time, as it had already lost a vote of confidence in the Czech Chamber of Deputies.

The question was brought up again during the government of Bohuslav Sobotka. Ultimately, there was a decision at the end of 2015 overruling the Limits on the Bílina Mine. The surrounding towns agreed with the decision. In exchange, the new Limit was promised to stay at least 500 meters away from populated areas, minimizing the most visible adverse effects, such as noise and dust (Bachoŕik & Valášková, 2015). Moreover, the decision kept the Limits on the ČSA mine in place, protecting the town of Horní Jiřetín from an ill fate.

Interests and their representatives

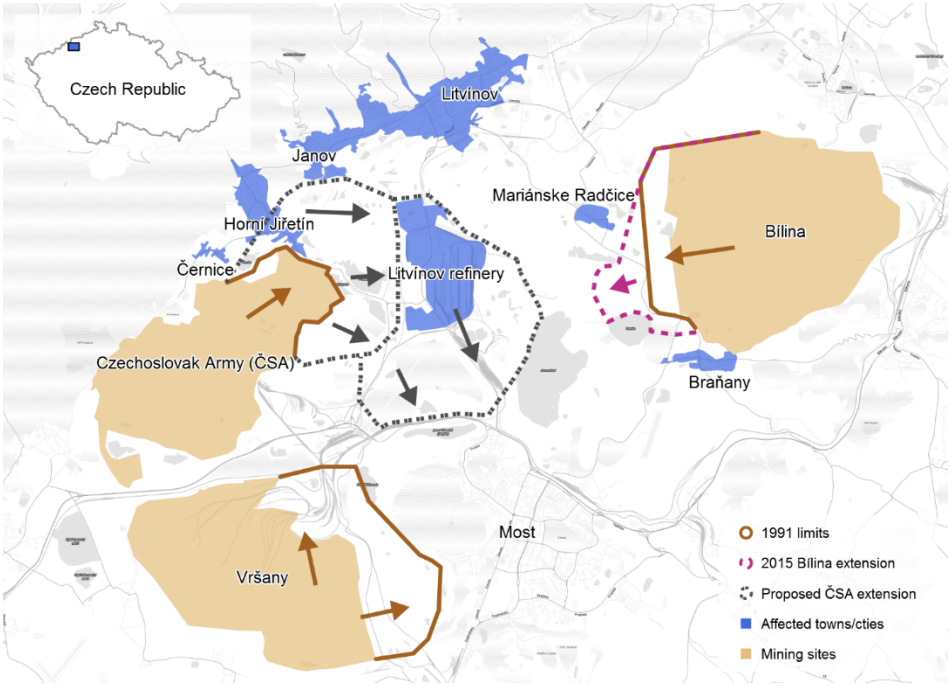
The following pages outline the involved stakeholders and their positions on the Limits, in an effort to illustrate the complexity of this issue and its divisive impact on various parts of Czech society.

The pro-mining camp

Heading up the side of the opponents of the Limits is, predictably, the Sev.en Corporation (originally Mostecká uhelná, later Czech Coal, since 2013 Sev.en). Sev.en is the owner of the ČSA mine, where the Limits are expected to be reached in 2024, and the Vršany Mine (see Figure 2). The company has openly called for the lifting of the Limits and has actively negotiated with the residents of Horní Jiřetín and Černice (the villages directly threatened by mining beyond the Limits at the ČSA mine) about compensation for their possible relocation. The second company involved is Severočeské doly, which is owned by ČEZ, a primarily state-owned power utility; it operates another relevant mine, Bílina (again, see Figure 2). Severočeské doly adopted a significantly more restrained position. While acknowledging the essential role of the brown coal behind the Limits for the stability of the domestic energy sector, the company has never actively engaged in activities aimed at rescinding the Limits, at least publicly.

As the excavators came closer to the Limits, the pro-mining camp increased in size and enlisted representatives of heating plants and the umbrella organization that coordinates their activities, the Association for District Heating (Teplárenské sdružení ČR). Emphasizing the extreme costs of rebuilding of the system to accommodate alternative fuels, its representatives succeeded in creating a publicly accepted narrative of brown coal as the only available source of affordable heat in the Czech Republic.

Figure 2 – Mining limits, mines, and affected towns (Česká televize, 2015)



Opponents of mining

Opposition to further mining has been built on both environmental concerns and an attachment to the local area (Černoch et al., 2019). While the activities of numerous nongovernmental organizations, such as Greenpeace or Friends of the Earth, have been driven by the general environmental agenda of local coal-related pollution and coal's contribution to climate change, the most intense resistance has come from the communities in the area. The symbol of this local opposition is the town of Horní Jiřetín. It is in the immediate proximity of the Czechoslovak Army Mine, located on top of the reserves, and lies in the direction of the envisaged expansion of mining activities. If the Limits on the mine were revoked, the town would be razed immediately at the beginning of resumed mining. Unsurprisingly, the local population has always been against the expansion of mining. A local referendum on the expansion of mining activities took place in

2005, with a voter turnout of 75%; 96% of the people were against expansion (Občanské sdružení Kořeny, n.d.). Grassroots organizations working against the expansion of coal mining emerged and became active in the local opposition to mining activities. Among the most prominent was Kořeny, a regional organization that has been active in neighboring Litvínov since 2007 (Černík, 2015).

The position of the relevant governmental bureaucracy

A significant factor driving the uncertainty surrounding the Territorial Limits concerns the fact that the policies governing coal mining and coal consumption are split among several agencies and regulators, which sometimes leads to incompatibility, overlap, and contradiction. The main policy documents at the national level guiding the particular steps are generally drafted either by the Ministry of Industry and Trade, unswervingly supporting the interests of the industry, or by the Ministry of the Environment (MoE), which generally exerts less vociferous effort to prevent any changes of the Limits.

The MIT is responsible for drafting the country's energy policy, as well as national policy on the utilization of raw minerals. The first conceptual document it issued on the topic, the State Energy Policy, had already stressed the existential importance of energy security. The exploitation of domestic coal resources played a pivotal role in this, as coal is the only abundant domestic source of energy. The 2004 version stressed that exploitation of coal was a high priority (Ministry of Industry and Trade, 2004b). This was echoed in the update of 2010, which called for the "removal of non-systemic administrative barriers to coal exploration, including the Territorial Limits" (Ministry of Industry and Trade, 2010). However, the 2010 update was not approved, and thus never entered into force (Vlček et al., 2019). The 2015 version of the Policy (the "State Energy Concept 2015") was the first to propose a slow and gradual phasing out of coal.

However, the document was written in an ambiguous fashion; it also stated that coal was irreplaceable "due to security and economic reasons," and also failed to provide or suggest any specific steps about how to achieve this envisaged reduction in the utilization of coal (Ministry of Industry and Trade, 2015). The Raw Minerals Policy, also prepared by the MIT, called for maintaining the current legal status of the coal reserves located outside the Limits, considering them strategic reserves, and explicitly connected the utilization of coal to the "fulfillment of State Energy Policy and Nuclear Energy Action Plan" (Ministry of Industry and Trade, 2017).

Directly opposing the rescission of the Limits have been the policy documents from the MoE, explicitly designed to reduce emissions of carbon and other pollutants. The most notable of these are the Policy of Climate Protection and the Policy of Air Protection (Ministry of Environment, 2016, 2017), with the single largest source of these pollutants being the combustion of coal. The State Environmental Policy has claimed that it is necessary "to decrease the share of fossil fuels in the production of electricity and heat" and "to increase the efficiency of existing energy sources" (Ministry of Environment, 2016).

This results in competing policy positions, which then translate into individual (and sometimes contradictory) policies. One example of this has been a large-scale, nationwide government program to provide subsidies for the modernization of domestic heating sources. The goal of the program was to combat air pollution generated by the combustion of coal and firewood in areas where no central heating is available, because – and regulators found that safe emission levels had constantly been exceeded (Ministry of Industry and Trade, 2015). Peculiarly, the first call for applications included subsidies for new coal-fired boilers, which were listed among the technologies eligible for the subsidy (Ministry of Environment, 2015). This move supposedly helped with municipal air quality, but locked in demand for graded coal, which had already been in short supply on the domestic market at the time (VUPEK - ECONOMY s.r.o., 2015).

Moreover, such support created a precedent that essentially shut down debate on the option of municipalities to regulate the use of coal in domestic heating.

The same mechanism has operated on a large-scale level. One example of this is the introduction of a new supercritical coal-fired unit at the Ledvice Power Plant in 2014. The unit was built by ČEZ; it has 660 MW of installed capacity and sits right at the edge of the Bílina Mine, operated and fully owned by ČEZ subsidiary Severočeské doly (ČEZ, n.d.). Investments in new plants, as well as state-sponsored support for small-scale coal consumption, created a fuel lock-in. This in turn created pressure to rescind the Limits, which ultimately resulted in the Bílina decision at the end of 2015. Therefore, while the MoE has required a reduction in the share of coal in the energy mix, the state-owned ČEZ has nevertheless procured a new coal-fired unit, and the government subsequently rescinded the Limits to fuel it.

Political parties and the government

One of the most important factors that has influenced the question of the Limits has been the inscrutable position of various political parties. This has manifested itself in a lack of resolve to push for a final (irreversible) settlement of the issue, or a roadmap towards one. ANO 2011, currently the strongest party in the Chamber of Deputies and the leader of the governing coalition since 2018, has consistently fought against rescinding the Limits since its establishment. However, it did not block the modification of the Limits at the Bílina Mine in 2015, when it was in the government with the Czech Social Democratic Party (ČSSD) and the Christian and Democratic Union (KDU-ČSL). The Czech Social Democratic Party sponsored the 2015 rescission, despite its previous promises not to (e.g., in its 2010 election platform). The KDU-ČSL even claimed it was in favor of permanent legal measures that would ensure the end of mining. Other parties, like the conservative, pro-business Civic Democratic Party (ODS) or

Tradition, Responsibility, Prosperity 09 (TOP 09) have not expressed strong opinions on the issue either. Moreover, there are internal splits present (notably inside the Czech Social Democratic Party) that further hinder the parties' clear positioning. The issue is highly divisive and would many political costs regardless of the direction of the decision. On one side, rescission at the most lucrative ČSA site would require accepting the destruction of homes in Horní Jiřetín and ignoring the stance and the interests of the local inhabitants, who vehemently oppose rescinding the Limits. On the other hand, strengthening the Limits through legislation is traditionally associated with the questionable future of the employees of the mining companies, and is treated with great caution. Since there are few political benefits, political parties tend to avoid taking positions.

There are only two parties within the whole political spectrum – the Green Party and the Communist Party of Bohemia and Moravia (KSČM) – that have strongly supported a final resolution of the Limits' status. The Green Party argues for keeping Limits in place, for legally recognizing them, and changing the legal status of the coal reserves located outside of the Limits. The Czech Communist Party is, on the contrary, a strong proponent of fully rescission of the Limits and the maximum utilization of coal located in Northern Bohemia. Neither of the two parties hold much real power, and even though they are present in the debate, they are not able to affect the direction of the policy too much.

This lack of clarity means the question of rescinding or maintaining the Limits is always contingent on the particular power position and the negotiation clout of parties forming the national government. Thus, ANO 2011 and KDU-ČSL supported rescinding the Limits in 2015, while the "pro-business" ODS kept the Limits in place in 2008 due to a coalition with the Green Party at the time.

As a result of this party division, governments through the years have never really taken any clear stance, with their representatives lacking the will and courage to risk the political consequences of either decision. The significant exceptions to this rule were the three caretaker governments, which actively pushed the issue of continuous mining: the government of Josef Tošovský in 1998, that of Jan Fischer in 2009, and that of Jiří Rusnok in 2013.

Internal factors affecting the future of the Limits

In this section, we discuss those factors at the level of the Czech Republic that would likely affect the future maintenance or rescission of the Limits. We focus on construction of new nuclear plants as a possible substitution for existing coal-fired power plants, on the development in the heating sector, on the financial issues connected to functioning of the ČSA mine, and on the dynamics of the anti-mining camp.

The emphasis on nuclear energy

According to the government's narrative, the future of the coal Limits seems to be inseparably linked to the fate of new sources of nuclear power in the Czech Republic. As the Raw Minerals Policy explicitly notes (Ministry of Industry and Trade, 2017), in the future "new nuclear reactors should replace a significant share of existing thermal power plants." Any delay in their construction may thus result in "the utilization of the strategic reserves of coal at the ČSA Mine." This narrative builds on the first imperative of the Ministry of Industry and Trade, which has equated energy security with self-sufficiency, and proponents of nuclear investment have habitually repeated the same line.

And indeed, the delay, or even absence, of any new nuclear-power source is not an implausible scenario. In 2009, in line with the long-term preferences of its main shareholder, the Ministry of Industry and Trade, ČEZ commenced bidding for the construction of two new reactors at the existing nuclear plant at Temelín, with an option for three additional blocks at other facilities. After years of struggle, the tender was canceled in 2014, supposedly due to questionable profitability and hesitation on the part of the government to financially support this investment (Černoch & Zapletalová, 2015). In light of these developments, the company accepted the reality of the European power market, with its low wholesale prices of electricity, surplus capacity, and expected price volatility, all of which would benefit more flexible generators.

At the end of 2018, the debate gained new momentum, with Prime Minister Andrej Babiš publicly announcing his support for new reactors (Czech Press Agency, 2018); he repeated the move in October 2019, when he claimed it was necessary to develop the new energy resources "…since energy security is our priority" (oEnergetice, 2019).

Over the years 2019 and 2020 two major cleavages emerged in both the political and public discourses. The first concerned the economics of the project. Similar to the 2014 tender, it was clear that ČEZ was neither willing nor able to finance the project itself. The government of Premier Babiš, however, was reluctant to step in financially. After months of negotiations, the government finally decided to fully assume the financial risks of the project. A package of treaties between ČEZ and the Czech Republic and legislation that is, at the time of writing, in the process of preparation have stipulated that ČEZ should be provided a favorable state loan and have the option to sell the project to the government in case of problems and that electricity from the new nuclear sources should be bought by a dedicated state agency at an administratively set price reimbursing the costs of construction (ČTK, 2020a). More recently, new information has emerged

suggesting that the state could take full and direct financial responsibility for the project, instead of supporting it indirectly (ČTK, 2021b).

The second cleavage was driven by geopolitical concerns related to the possible participation of Chinese or Russian companies in the tender. Their possible involvement was intensively criticized by the Czech intelligence services and political opposition. On the other side, especially President of the Czech Republic Miloš Zeman and some political parties such as KSČM considered the possible exclusion of those two countries from the tender a political and economic mistake. While participation of companies from China was rejected during the negotiation, the involvement of Russia's Rosatom was eventually turned down in response to the publication of information about Russian involvement in the Vrbětice ammunition warehouse explosion in April 2021.

At the time of writing (May 2021), the whole tender has clearly come to a standstill. A few months before parliamentary elections and damaged by the discreditation of Rosatom, politicians seem to have neither the energy or will to move the project forward, claiming that a decision about the future of nuclear energy in the Czech Republic is to be taken by the future government (ČTK, 2021a). The decision to postpone the tender could have a significant impact on the coal phase-out, since the new reactors were assumed to replace the expected decrease in production from coal-fired power plants.

The role of coal in heating

Despite the progressive decline of the share of solid fuels in energy production, the process has nonetheless been very gradual. The district heating industry and the power industry are still to a large extent reliant on old coal-fired technology, and thus on cheap supplies of coal. When coal was abundant, this was not an issue. However, the competition for coal supplies will increase over time.

Potential price hikes, as well as higher price tags on carbon, are likely to put more pressure on companies that depend on reliable coal supplies.

Moreover, there is natural imbalance between the heating and the power industries, with the power industry being much more coal-hungry. In 2017, brown coal generated 42% of Czech electricity, as well as 42% of its heat (Energy Regulatory Office, 2018a, 2018b). However, the absolute volume of coal used in power plants is much larger than that used in district heating plants. Available data from 2013 show that power plants consumed 27.62 million metric tons, while 7.77 million metric tons were burned in heating plants that year (VUPEK - ECONOMY s.r.o., 2015).

At the same time, the heating industry is much more limited in its ability to curb production in the case of price hikes. Although the power industry consumes most of the available coal, a great deal of it is used for profit only – exported and sold on European markets in the form of electricity. The heating industry is much more vulnerable, as any shutdown would immediately affect its customers – an inflexibility which is not present in the power industry. Moreover, price hikes incentivize individual customers of heating companies to disconnect from the central heating systems and opt for individual heating systems instead, making the system less efficient, and thus again increasing the price for district heat. At the same time, investment that would allow for fuel switching in heating companies are contingent on economies of scale, which are profoundly threatened by price volatility. The coalition supporting the Limits' rescission, including the government, recognized this, and used the heating industry as a pretext and one of the main arguments for rescission of the Limits at Bílina in 2015 (Ocelík et al., 2019).

Future attempts to rescind the Limits will likely depend on the position of the heating industry on the issue, and of the state to guarantee that coal supplies would remain available to the heating industry; this could be achieved by making it the primary and preferred recipient, even at the expense of the interests of power generation. Such a move is, however, likely to be met with distaste from the power industry.

The price of resuming mining at the Czechoslovak Army Mine

The cost of resuming mining operations at the ČSA site is becoming higher and higher as time passes, and thus less likely. Sev.en (formerly Czech Coal) has already reached the Limits on excavation of the overburden and is proceeding towards the Limits on coal mining itself, which it will reach around year 2023. The overburden excavators were mothballed at the end of 2016, and have been sitting idle since then (Czech Press Agency, 2016). Rescinding the Limits would not mean an immediate restart of mining in practice, but would only allow the company to start with all the required steps, such as buying out the land and houses in Horní Jiřetín, going through the necessary permitting procedures, such as environmental impact assessments, etc. The company made an estimate regarding the duration of these steps and claimed it would take four to five years (Průcha, 2015). The company would only be allowed to restart mining of the overburden after getting all necessary permits, and it would take a few additional years to unearth new coal reserves. Even if the Limits were rescinded immediately (at the end of 2019), the coal from ČSA would likely run out sooner than mining of overburden would start. Then, the company would have to invest its own resources, which would significantly diminish its income (compare (Pšenička & Mařík, 2012). Czech Coal (Sev.en) was well aware of this fact and tried to push the government into a decision very early on, with little success. Sev.en could still potentially weather the costs of resumption, since it also operates the Vršany Mine, but as time progresses, the costs would become more and more comparable to starting a mine from scratch at a new site. Moreover, all

this would only be possible if irrevocable reclamation steps, such as flooding, could be avoided at ČSA at any cost.

The strength of the opposition

The future of the Limits will also be contingent on the strength of the local opposition, which has been trying to provide arguments to maintain the mining Limits. The nationwide narrative portrays the opposition as motivated by "not-in-my-backyard" thinking, and opposition is thought to be based on individual attempts to extract personal gains – a gross misunderstanding of the situation. Recent research has shown that opposition to coal mining is based on entirely different grounds. Among these, the desire to preserve threatened communities (such as Horní Jiřetín) from the destruction wrought by mining has been shown to play an crucial role (Frantál, 2016). Along with that, environmental concerns have played a large role in opposition to further mining of coal, both at the national and the international level. Such profound misunderstanding of the coalmining opposition, present throughout the history of the conflict over the expansion of ČSA, is likely to continue over time. The local population in turn interprets this as further proof of the arrogance of those in power and their ignorance or disregard of the interests of the local population. Further disenchantment stemming from a lack of representation and voice on the local level is likely to mobilize a strong opposition movement, which will be present whenever any hint of change with respect to the Limits emerges.

Czech “Coal Commission”

Inspired by the German example, in July 2019 the Czech government established an expert body to plan for a coal phase-out in the country, the so-called Czech Coal Commission. Consisting of 19 representatives of government, industry, regions, labor unions, universities, and environmental NGOs, the Commission was charged with preparing possible scenarios for the phase-out, analyzing possible impacts, suggesting remedies for impacted parties and, most importantly, suggesting the coal consumption deadline for the government to agree on. Three possible scenarios were taken as a starting point for the analysis: the so-called “fast track”, with coal consumption phased out between 2030 and 2035; “medium track”, aiming at 2035 through 2045; and “slow track”, with a deadline between 2045 and 2050 (ČTK, 2020b). Delayed by the Covid-19 pandemic, on December 4, 2020 the Commission finally reached an agreement for 2038 as the suggested deadline for coal phase-out in the Czech Republic.

Unsurprisingly, considering the sensitivity of the issue, the work of the Commission was accompanied by multiple controversies. The Commission was criticized for a lack of ambitiousness, supposedly caused by consisting predominantly of pro-coal representatives, including mining and energy companies, with only two “environmentally friendly” representatives—Jan Rovenský from Greenpeace and Jiří Koželouh from Hnutí Duha. Claiming to equilibrize the debate, the so-called “Shadow Coal Commission” was established by a group of interested individuals with an openly critical stance towards the continued consumption of coal in the Czech Republic, providing its own analyses and expertise (see www.uhelnakomise.cz).

The Commission’s recommendations have also been questioned due to the fact that the government postponed its final decision about the term of the phase-out

to the end of 2021. In the meantime, the Commission should continue working on the details of the transformation. In practical terms, the final decision has thus been shifted to the next government following parliamentary elections in September 2021 (ČTK, 2021c).

All the work could, however, be in vain due to external factors. The EU's increasingly stringent climate policy has been driving up the price of carbon in the form of EU ETS allowances. This is directly translated into worsening competitiveness for both the electricity and heat produced from coal. A growing number of energy sector representatives claim that the 2038 deadline is rather late considering these changing market conditions and that the government should start working on strategies how to deal with an increasingly real chance of industry abandoning coal even earlier (Lukáč, 2020; Souček, 2021b, 2021a; Zenkner, 2021)

Regional context – the situation in Germany and Poland

With the EU committing itself to decarbonization, coal's days seem to be numbered in Europe (Marcacci, 2018). Countries such as Austria, Spain, Denmark, Luxembourg, and the UK have already reduced their coal consumption; in countries where coal still plays a significant role, the situation is more nuanced, as illustrated by the example of Poland, Germany, and the Czech Republic – these three countries alone are responsible for more than half – 57% – of the EU's total coal consumption (see Table 3). Although they are confronted with climate-related demands from the EU as well as from some of their own populations, coal-restricting policies in these countries are hindered by the fundamental role this fuel plays in the energy mix, their energy security, and the local economy of producing regions. Having already presented the case of the Czech Republic, we may now focus on these other two countries. A brief introduction of their cases should provide us with some context for the development in the Czech Republic itself.

In the last few years Poland seems to have continued along its traditional energy path. The medium-term consumption of coal was cemented by a stream of newly constructed coal units (see Table 4), and state-owned company PGE is expanding the Turów mine on the Polish–Czech border to keep it operational until 2044—a step that initiated a serious protest from the Czech side. The government has also been active in restructuring the coal-dependent energy sector to face stringent EU environmental regulation and the uncertain economics regarding this fuel. "Coal is the foundation of our energy sector, and we cannot and do not want to abandon it," emphasized Polish Prime Minister Mateusz Morawiecki in 2017, acknowledging the role coal plays in the energy security of the country and its very identity.

Table 3 – Hard coal and lignite/brown coal production (IEA, 2017)

Country	Hard coal			Lignite/brown coal		
	2015	2016*	Growth	2015	2016*	Growth
Poland	72.7	70.7	-3%	63.1	60.2	-5%
Germany	6.6	4.1	-39%	178.1	171.5	-4%
Czech Republic	8.7	6.9	-20%	38.1	38.5	1%

** Data for 2016 estimated*

The latest developments, however, indicate that Poland is on its way to changing course. During the 2019 parliamentary and presidential elections, all relevant actors emphasized the necessity to gradually move from coal to cleaner sources of energy. Minister of the newly established Ministry of Climate Michał Kurtyka proposed a new energy policy until 2050 which foresaw the reduction of coal in the energy mix to the level of 56%. Moreover, the date for the Polish coal phase-out was recently agreed between major mining company PGG, representatives of mining unions, and the government. Also, other energy companies in the country are targeting less carbon-intensive production. For example, both PGE and Tauron have introduced plans to switch to renewable sources of energy. This political and industrial shift, however hesitant, is also highly supported by the public. According to a 2019 public opinion poll, 76% of Polish citizens want the country to phase out coal by 2030 (Černoch & Konvalinová, n.d.). Considering the deep embeddedness of coal in Polish society and industry, it is difficult to evaluate how these initiatives and steps will be translated into reality. Nevertheless, it is obvious that even in such a country with a long and proud coal tradition, this fuel is endangered.

Table 4 – Coal power plant construction in Poland (Caldecott et al., 2017)

Location	Fuel type	Operator	Installed power (MW)	Commissioning date
Kozienice	Hard coal	Energa	1075	Commissioned in 2017
Jaworzno	Hard coal	Tauron	910	2019
Opole	Hard coal	PGE	1800	2019
Turów	Lignite	PGE	450	2019
Czeczott	Hard coal	Kompania Węglowa	1000	2018
Kędzierzyn-Koźle	Hard coal/gas	Zakłady Azotowe Kędzierzyn	165	2019
Ostrołęka C	Hard coal	Energa, Enea	1000	-

A more radical position has been taken by Germany. Its self-asserted position as a climate champion has been challenged by the unsatisfactory effect of the Energiewende on the domestic emission of greenhouse gases, with low-carbon electricity from renewable sources only offsetting the low-carbon electricity from decommissioned nuclear power plants, and with coal remaining as the stable cornerstone of the energy sector (Schalk, 2018). To move forward, a multi-stakeholder Coal Commission was established in 2018 to draft a transparent plan and data for phasing out both hard coal and brown coal. Acknowledging the significant opposition of the industry, as well as labor unions and politicians in coal-dependent regions such as Lusatia and parts of North-Rhine Westphalia (Appun, 2018), and taking into consideration concerns about the reliability of energy production, the Commission reached a compromise in July 2020.

According to the 300-page report, coal-fired power generation should be ended by 2038, with the possibility of aiming for 2030 if the situation in the energy sector allows (BMWi, 2019). Around 40 billion euro has been earmarked to cover the social and economic costs of the phase-out, and complex schedules for both the lignite and hard-coal sectors have been introduced. These plans envisage either voluntary (based on auctioning of phase-out generating capacities) or mandated shut-downs of power plants and the closing of lignite mines (last hard-coal mine was closed in 2018). Massive investment in local infrastructure, business, and social programs are also planned as part of this process. The plan also bans new coal-consuming plants, with the exception of Uniper's Datteln 4 power plant, which thus represents the very last coal power plant to be built in this once global coal superpower (Wettengel, 2020).

SECTION 3

THE DEPICTION OF COAL MINING IN THE MEDIA

In this section, we assess how the issue has been presented to the public using a media analysis. The section summarizes results of the research conducted by Lehotský (Lehotský, 2018) and results as discussed in the pre-print of the article by Lehotský et al. (Lehotský et al., 2019). We conduct a content analysis of Czech print media between 1996 and 2016. The media analysis results serve as a rough approximation of the discursive representation of coal mining. For that reason, conducting a media content analysis complements the analysis of the historic development of coal mining in the country, and thus further aids in our understanding of the Czech Republic's coal mining policy. Our focus on media is driven by the fact that the media are often an important source of information for the public (including policymakers), and they cultivate particular narratives about coal. Of course, media provide only a partial picture of the overall system. There are also other channels through which information flows – from interpersonal networks to social media. Nevertheless, we still find media to be a very appropriate source for the overall nation-wide discourse on the coal mining. The theoretical framework of agenda setting and decades of research in this field have proven that media outlets retain their influence on the public. Based on this reasoning, we are interested in what themes are most pertinent when coal mining is discussed in the media domain.

We built our argument on the very broad theoretical claim that language is important in the way shared meaning is generated and maintained, as well as changed (Davies & Harré, 1990; Fairclough, 1993). Kellner has pointed out that:

> "language and communication are integrally embedded in power in an existing social system, they serve interests of domination and manipulation as much as enlightenment and understanding, and they are subject to historically contingent and specific constraints and biases. Hence, on this view, language in contemporary society is functionalized and rationalized; its meanings and uses are socially constructed to serve social interests, including legitimation and domination; and thus, it is never pure and philosophical, universal and transcendent of social conditions.… [L]anguage is thus integrally related to power and is the instrument of particular social interests that construct discourses, conventions, and practices, while embedding language and communication in untruth and domination…" (Kellner, 2014)

Based on Kellner's argument, language is never transparent, unbiased or static. It evolves dynamically, through constant use. Words acquire new meanings, where subtle nuances are built and stabilized through the ways language is used daily by language users, i.e. actors.

These actors "use words, images, and symbols to strategically craft policy narratives to resonate with the public, relevant stakeholders, and governmental decision makers, with the aim of producing a winning coalition" (Shanahan et al., 2011). Different actors, who have different and often conflicting interests, try to affect the way stories are told, focusing on certain aspects of the issue and highlighting certain ideas (Hansen, 2010). Fierke called such use of language "strategic" (Fierke, 2002). If certain narratives dominate, they may even establish themselves as a benchmark for the evaluation and comparison of raw facts (Miller & Riechert, 2013; Schmidt et al., 2013). Through all this activity, language and

words are constantly used and reused, and meanings are either changed or solidified.

The second part of our argument focuses on the use of language specifically in media. We argue that it is media that serve as the arena where language is used to form narratives. Media organizations as actors affect "which ideas get the news coverage and which don't" (Hansen, 2010). This process might be entirely unintended, yet, through its mechanism of operation, certain narratives become more visible, while others become less pronounced or even virtually invisible (Boykoff, 2008). For this reason, media "play a crucial role in framing the scientific, economic, social, and political dimensions through giving voice to some viewpoints while suppressing others, and legitimating certain truth-claims as reasonable and credible" (A. Anderson, 2009). It is in this way that clashes over the meaning of issues unfold live in the public, showing powerful actors, their positions, alliances, and the like (Leifeld, 2016). Narratives published in media find their respective audiences. This is how perceptions, imagery, and understanding of these topics are constructed and legitimized (Steffek, 2009). The subsequent public support lends legitimacy in furthering actors' position and legitimizing their interests (Cox & Pezzullo, 2016) in an ever-evolving intersubjective cycle. As such, we cannot separate the media from the exercise of power and power struggles – "controversies and debates are not just 'surface phenomena' of political processes but are rather an integral part of power structures and exchange relations" (Schneider & Ollmann, 2013).

The third part of the argument focuses on the specific mechanism by which language used in media creates and maintains meanings and understandings of an issue. The theoretical approach of agenda setting is very useful for understanding the mechanism of media impact on media consumers through the accessibility of messages (Scheufele & Tewksbury, 2007). This theory claims that media coverage is composed of various issues ("objects") to be covered. Consumers of media messages tend to see objects' importance according to the

amount of coverage of those objects. The more an object is covered, the more importance it is given by media consumers, creating higher perceived "salience" of the object (M. E. McCombs, 2004). In the original research of McCombs and Shaw, they hypothesized that media outlets were capable of changing preferences of voters through the amount of coverage of political candidates and thus indirectly shaping the outcomes of elections. It was shown that consumers could remember the objects which had been covered the most (M. E. McCombs & Shaw, 1972). Through this mechanism, the theory conceived media as agents who set the agenda and actually generated salience of objects through the amount of focus given to those objects. Many research undertakings corroborated this proposition of a causal mechanism – both in real-life and experimental settings (M. E. McCombs, 2004). In a later theoretical development, the agenda-setting theory became more nuanced. It was acknowledged that objects in the agenda are not black boxes but consist of more sub-objects or "attributes". The salience of attributes may be also increased or decreased in a same agenda-setting mechanism as the salience of objects. In order to distinguish these two mechanisms, the agenda setting of an object is called "first-order", while agenda setting at the level of the attributes of an object is called "second-order" (M. E. McCombs, 2004). The theoretical discussion over agenda setting also focuses on the agency of the media in agenda creation. While the original agenda-setting instances do not specifically address the agency of media in the agenda-setting process, Weaver and Elliott (Weaver & Elliott, 1985) claimed that media had active agency in choosing and presenting topics. In similar research, Elder and Cobb (Elder & Cobb, 1984) described this process as "agenda-building." The media not only decide (potentially unknowingly or based on unstated biases) what importance should be given to issues by selectively choosing strength of coverage but make decisions about the issues themselves instead. Thus, media actively contribute to the amount of coverage of certain objects through editorial decisions, which are taken deliberately (Weaver & Elliott, 1985).

It is important to highlight that using an agenda-setting approach with media content should be interpreted with caution. The appearance of objects and their attributes in media content cannot be understood as a direct and perfect cause of

salience. In other words, media content does not automatically translate into perceived salience in media consumers. The reception of media content by its consumers is a much more complex process, where other factors intervene. A perfectly valid measurement of the salience of objects or their attributes could be done only through surveys of media consumers. Thus, the analysis of media content is rather a proxy measure of salience wherein the media's agenda-setting function is assumed rather than directly measured. At the same time, this assumption is supported by the existing body of the agenda-setting literature, where correlation between objects and attributes and their salience is consistently shown over time and across different domains and different levels of analysis.

Taking into account the above disclaimer, the goal of this section is to analyze what McCombs called the "content analytic" part of the agenda-setting process (M. McCombs, 2005). In line with Kiousis (Kiousis, 2004), we followed the occurrence and frequency of themes appearing in news – a measure of what and how often a particular theme appears (Kiousis, 2004). The section investigates the second-order agenda setting on coal mining – the salience of individual attributes, from which the media composes the object of "coal mining" as such.

Media articles

This section delves into the corpus of all media articles in the Czech press, which were retrieved via full-text search of national print media. Any article containing the phrase “coal mining” published in national print between January 1, 1996, and December 31, 2016 was included. The size of population forming this corpus is 6122 articles. The lowest annual number of articles is 163 in 1996; the highest number is 462 in 2006. The number of documents and their lengths are included in Table 5. The number of media texts varied greatly over time, with low coverage during the 1990s, and the highest spike in 2006. The coverage development between 1996 and 2016 is depicted in

. We also visualize the basic variation of article lengths in a per-year boxplot chart in Figure 4. The original corpus of all articles contained 2,994,603 words.

Figure 3 – corpus statistics: number of articles per year

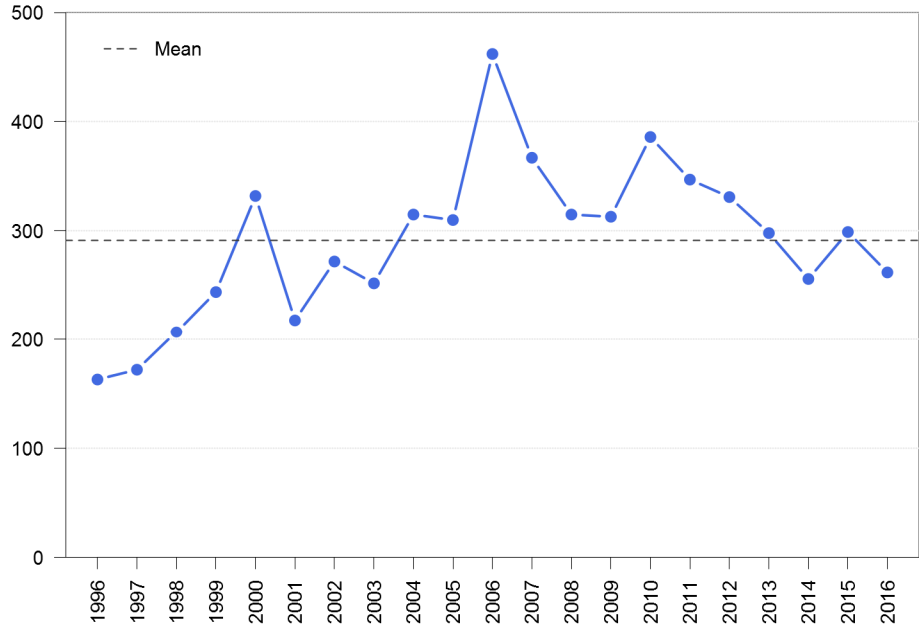
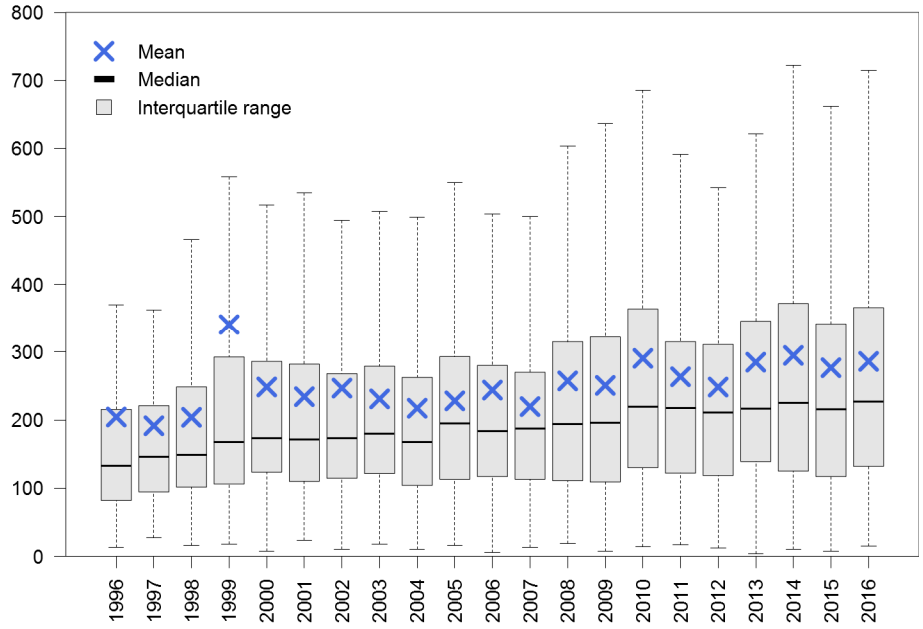


Table 5 – Corpus statistics: basic annual statistics at the level of articles

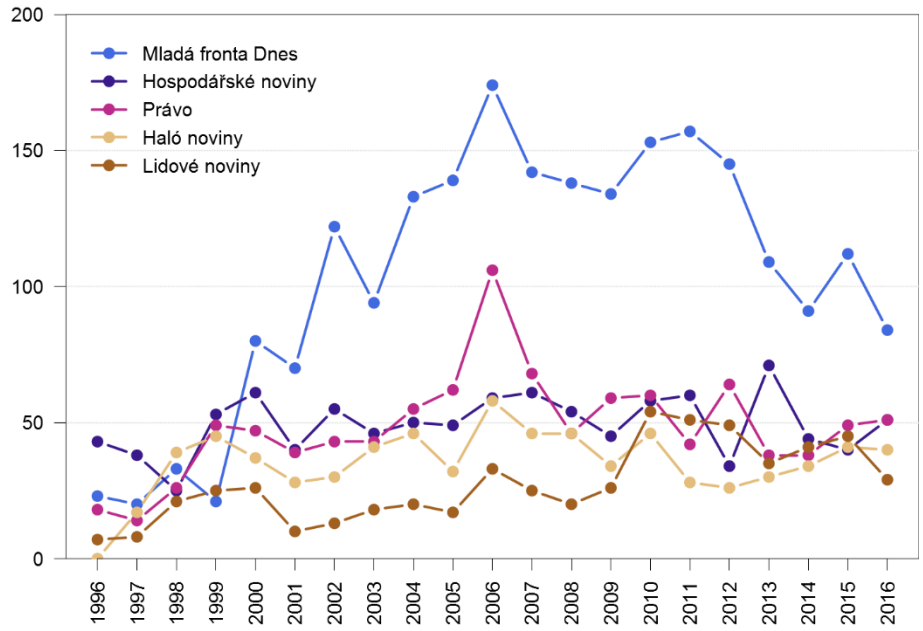
Year	Articles	Words	Min. length	Max. length	Average l.	Median l.
1996	163	33311	13	1133	204.36	133
1997	172	32938	27	911	191.5	145.5
1998	207	42217	16	1253	203.95	149
1999	244	83152	18	29556	340.79	167.5
2000	332	82490	8	4987	248.46	173.5
2001	218	51054	24	1804	234.19	171.5
2002	272	67123	10	4615	246.78	173
2003	252	58202	18	1392	230.96	179.5
2004	315	68426	10	1421	217.23	168
2005	310	70696	16	1157	228.05	195
2006	462	112415	6	2310	243.85	184
2007	367	80170	13	1925	219.64	187
2008	315	80806	19	1630	257.34	194
2009	313	78481	8	1264	250.74	196
2010	386	112157	14	1975	290.56	219
2011	347	91167	17	2225	263.49	218
2012	331	82196	12	1391	248.33	211
2013	298	84891	4	1770	284.87	217
2014	256	75486	10	1449	294.87	225
2015	299	82469	8	1957	276.74	216
2016	262	74942	15	2060	286.04	227

Figure 4 – Corpus statistics: article lengths in corpus (outliers are omitted)



The corpus may be described from the perspective of individual media outlets. The corpus contains articles from both what may be considered "quality" newspapers, as well as tabloids. The dailies *Právo*, *Hospodářské noviny*, *Mladá fronta Dnes*, *Lidové noviny*, *Haló noviny*, *Blesk*, *Sport*, *Metro*, and *Aha!* are still being published at the time of writing of the book. *Slovo*, *ZN Zemské noviny*, *Telegraf*, *Super*, *Impuls*, *Práce*, and *Šíp* have been discontinued (Anopress IT, n.d.). However, approximately 90% of the articles forming the corpus were published in *Právo*, *Hospodářské noviny*, *Mladá fronta Dnes*, *Lidové noviny*, or *Haló noviny*, with quality papers *Mladá fronta Dnes*, *Hospodářské noviny* and *Právo* being the first three. *Mladá fronta Dnes* surpassed any other daily in its coverage by a large margin, publishing far more articles per year than any other daily (35% of the whole corpus). For more detail, see Figure 5.

Figure 5 – Annual media coverage according to absolute frequency



It is worth noting that some of the papers in the sample were linked to coal-mining companies in certain periods of time, predominantly through ownership. One of owners of *Blesk* and *Aha!*, both tabloids, is Daniel Křetínsky, the primary owner of EPH, one of the largest coal operators in the country. The publishing house Economia, who is the publisher of *Hospodářské noviny*, was acquired by Zdeněk Bakala, owner of the mining company OKD between 2004 and 2016. The list of owners of the media houses as well as their circulation can be seen in Table 6.

The goal of content analysis is to uncover meanings and ideas through systematic processing, categorization, and interpretation of any communications. This requires extracting observations from the text data (Krippendorff, 2013; Neuendorf, 2017). In order to acquire the attributes of coal mining and their

Table 6 – Overview of Czech papers in the data corpus

Title	Published	Owner	Readership	Paper type
Blesk	1992 -	Czech News Center	1,237,000	Tabloid
MF DNES	1990 -	MAFRA	806,000	Broadsheet
Metro	1997 -	MAFRA	420,000	Broadsheet
Sport	1953 -	Czech News Center	359,000	Sport
Právo	1990 -	Pravo	289,000	Broadsheet
Aha!	2004 -	Czech News Center	254,000	Tabloid
Lidové noviny	1893 -	MAFRA	210,000	Broadsheet
Hospodářské noviny	1990 -	Economia	181,000	Broadsheet
Halo noviny	1991 -	Futura a.s.	-	Broadsheet
Slovo	1945 - 2000	-	-	Broadsheet
Zemské noviny	1996 - 2001	Vltava-Labe-Press	-	Broadsheet
Telegraf	1993 - 1997	INTEGRA, a.s.	-	Broadsheet
Super	2001 - 2002	e-Media, a.s.	-	Tabloid
Impuls	2003 - 2003	-	-	Broadsheet
Práce	1945 - 1997	-	-	Broadsheet
Šíp	2005 - 2009	Vltava-Labe-Press	-	Tabloid

salience, we relied on automated classification of texts. This approach is useful for the exploration of unknown categories that may be contained in the data sets. The categorization algorithm is based on finding regularities and patterns (latent structures) that cannot be observed in just a few documents, but may emerge from large corpuses (Grimmer & Stewart, 2013). We chose the most explored and well-known approach, called topic modeling, and its most widely used model,

called Latent Dirichlet Allocation (D. M. Blei et al., 2003). It is a fully unsupervised algorithm, which allows word clusters to be discovered. These clusters are called topics, and can be interpreted according to their specific content (D. Blei et al., 2010). Topics are useful since they may be interpreted as issues, events, or themes contained in text data. They emerge based on the "recurring patterns of occurrence" of particular words in articles, and as such they are understood as latent structures from which documents are created (Maier et al., 2018). Topics thus mirror the discursive terrain of texts, summarizing the overall content of any given text corpus (Jacobi et al., 2016). Another advantage is that they can be paired with document metadata, such as date, publication, or author, as described in the following paragraph.

In this research, we used a model with 50 topics, which could provide us with enough granularity while at the same time providing sufficient generalization. The process of selecting the number of topics is delicate and requires careful validation by the researcher (Grimmer & Stewart, 2013). For that reason, we created several topic models with varying numbers of topics and checked for interpretability of topics based on the test developed by Chang et al. (Chang et al., 2009). Once the suitable model was selected, the most probable words belonging to each topic were read, interpreted and assigned an adequate label. We than looked for similarities among the word clusters and grouped these into more general "categories" based on the most probable topic words. Thus, we were able to understand topics and their categories as media agenda attributes. After the interpretation of topics, we turned back to topic–article interaction. We found the most prominent topic in each article (i.e., we assigned a primary "general theme" to the article) and counted the frequencies of articles covering each specific topic. If a certain topic had the highest probability for the article, we would consider it as the main topic of such article. In case there were two equally likely topics for an article, we classified the article as belonging under both topics. These situations were, however, quite rare. Subsequently, we paired the topic information with the publication year and thus obtained the frequency of topics over time. The frequency of topics over time allowed us to approximate

salience of attributes in the media agenda. Finally, we created a random sample of articles within each of the aforementioned broader categories, drawing 5% of all articles in the category. We read these sampled articles to understand and evaluate whether themes and identified labels and categories were chosen appropriately (Maier et al., 2018). This final step also enriched the understanding of attributes in the media agenda and allowed us to interpret them in a more nuanced way. It is important to note that this step was done only after topic labels and categories were identified, thus serving primarily as a validation of results.

Media content

We can start by discussing the results of the topic discovery algorithm. The most basic insight – that of which topics actually appear in the corpus – are presented in Table 7, which lists all 50 topics by name (the label assigned by researchers), ordered by the frequency of a given topic appearing in articles (in other words, approximate salience). The two most frequent topics emphasize the importance of the Territorial Limits. In other words, the two topics related to the Limits were the most frequent topics in the corpus. The qualitative sample of articles corroborates this finding. The sampled articles show detailed reporting of the positions of stakeholders like representatives of Horní Jiřetín and the Ministry of Industry and Trade on the topic of the limits as well as frequent mentions of the limits in various contexts. A topic that was somewhat similar in nature ("mining_frenstat") occupies third place. It concerns media coverage of a never-implemented project for an underground hard-coal mine in the town of Frenštát in the Beskids. Local opposition to the mining activity prevented the mine from breaking ground. The qualitative sample shows these articles tend to cover the unclear future of that mining locality. In sum, all three of the first three topics focus on limits on preventing mining. Other major topics captured particular issues – specifically the reclamation of mining territories, miners' strikes for better working conditions, or tumultuous development regarding the OKD Company. It is also apparent that there were many topics that were only tangentially related to coal mining activities – most notably, these included topics around cultural landmarks and tourism.

Table 7 – Topics, article frequencies, and general categories

Topic	Frequency	Theme
limits_general_decision	319	limits

limits_horni_jiretin	255	limits
mining_frenstat	244	mining
energy_sources	235	energy
politics_elections	234	politics
economy_okd	229	economy
culture_landmarks	217	other
social_miners_strikes	197	other
environment_reclamation	194	environment
city	193	other
culture_general	191	other
energy_nuclear	189	energy
economy_profit	184	economy
mining_kladno	178	mining
economy_investment_eph	172	economy
economy_mus_sd	162	economy
tourism	149	other
energy_heat_prices	148	energy
politics_govenrment_state_energy_policy	139	politics
mining_opposition_activism	138	mining
social_employment	128	other
politics_government_members_operations	128	politics
environment_reclamation_subsidies	127	environment
residual_topic 5	126	residual

politics_ir_world	122	politics
environment_ecology	120	environment
politics_world_war_2	120	politics
mining_general_activity	119	mining
politics_region_usti	113	politics
mining_tragedies	111	mining
culture_vitkovice	107	other
mining_law	103	mining
transport	95	other
economy_production	85	economy
residual_topic 2	85	residual
legal_illegal_activities	77	other
politics_ir_eu	77	politics
economy_regional_growth	76	economy
residual_topic 3	74	residual
city_most_region	68	other
economy_company	65	economy
residual_topic 6	50	residual
economy_subsidies	47	economy
politics_state_general	46	politics
economy_general	40	economy
research_academy_science	40	other
czech_german_relations	37	other

residual_topic 4	13	residual
residual_topic 7	11	residual
residual_topic 1	8	residual

After we aggregated the frequencies from Table 7 into categories, the overall structure of the content of the media articles in the corpus becomes more apparent. Table 8 presents these aggregated results. The issue of Limits becomes less apparent relative to other categories. The importance of economic and political topics becomes very apparent. Not only is there a high number of topics related to the economy, but there are many articles among these topics – altogether, "the economy" is the second-most prevalent general category in the corpus. This also holds true for the articles belonging to topics subsumed under the category of "politics." These topics generally captured the decision-making process related to coalmining activities, or politics in general (ranging from local to international). Topics capturing the Territorial Limits, energy, and the environment were all approximately similar in their frequency. All three categories were far less frequent than the categories containing economy or politics-focused articles. The "environment" category was the least frequent non-residual category in the corpus. This is true despite the fact that the "environment" category covered both the reclamation of mining territories and the environmental impact of mining. The category "other" is the most prevalent. This is not surprising, as many unrelated but nevertheless important topics fell under category.

It is possible to disaggregate the frequencies of articles and categories displayed in Table 7, and reshape them to depict the development of these categories over time. To do so, we used time-series charts, which could display the development of categories, as well as a summarizing boxplot, which could also show the variation of a theme's coverage by year. The frequencies in all charts are visualized as a relative share of given category on the overall number of articles

published in each according year in order to control for the higher overall coverage per year.

Table 8 – Topic model results: frequencies aggregated into categories

Category	Absolute frequency	Relative frequency
other	1499	23.48%
economy	1060	16.60%
politics	979	15.33%
mining	893	13.99%
limits	574	8.99%
energy	572	8.96%
environment	441	6.91%
residual	367	5.75%
Total	6385	100.00%

The frequency of articles belonging to categories of "the economy," "limits" and "the environment" is depicted in Figure 6. The results clearly show that economic and political categories dominate the narratives about coal mining. There has been a noticeable focus on the economic performance of specific companies. Economic coverage was particularly important around the times when tumultuous developments in the coal sector were taking place. We can see more coverage at the end of the 1990s and the early 2000s, around the time that brown and black coal companies were taken over by questionable groups, and when the state sold the remaining shares of OKD and MUS to their respective majority shareholders. Another spike is visible from around the time when OKD started to encounter troubles and was considering a significant decrease in mining activity and worker layoffs between 2013 and 2014. The focus on economic performance

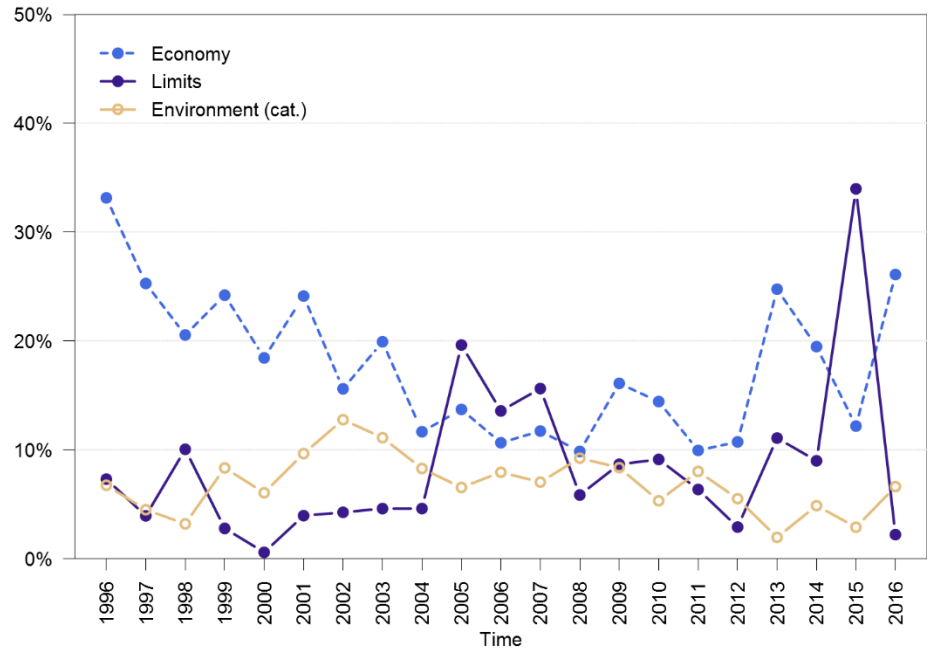
of companies and several associated topics suggest that coal mining is predominantly understood as an economic question. This is also apparent from the qualitative sample of articles, where the health of companies is discussed in detail – e.g., mining companies' revenues, income and financial health; mine closures; unclear future of OKD; and changes in the ownership structure of both brown and hard coal operations. Coal mining is also used as an example of an important economic issue in economy-oriented interviews. Some coverage is shorter and provides only reporting on the economic situation of companies (e.g., stocks, revenues).

It is clearly visible that the mining Limits attracted a lot of coverage during periods when decision-makers were debating the question. The conflict over the right to continue mining was well reflected in the media. This issue was and is very polarizing, driving a coalition of regional actors and environmental organizations against the mining companies and the Establishment. This means that in addition to from the clear cleavages, there were also easily identifiable actors with clear positions. Moreover, the destruction of settlements itself warranted media interest. Hence, it would not be surprising if the issue had always been interesting for journalists. 2015 was a point of culmination. That was the year the Ministry of Industry and Trade revoked the Limits at Bílina mine. Before the Ministry overturned the 1991 decision, there had been an escalation of pressure on all sides throughout 2014. Mining companies pursued a maximalist option, including the razing of Horní Jiřetín (see the background Section 2). Local representatives of the surrounding towns fought the decision vigorously together with environmental organizations, attempting to preserve the status quo. Despite political support from the Establishment, they outsourced expert opinions to external academic and research institutions to achieve higher legitimacy. The media followed this development closely, resulting in the very high coverage of 2015. The qualitative sample corroborates this, as discussed above.

The discussion of economy-related topics, as well as the Territorial Limits, share some basic characteristics. They are grounded in journalistic norms, especially their novelty and their shocking nature, which drive the interest of newspapers' readership. Moreover, these issues contain a conflict with clearly delineated sides. As such, it is easy to construct narratives that correspond to the specific media genre; this also follows standard journalistic norms (McQuail, 2010). Berglez suggested that this could be understood as staying within the media logic – attempting to present an issue as a digestible and comprehensible media product, which is then served to the audience (Berglez, 2011).

A comparison of economic and environmental topics is visible in Figure 7. Unlike Limits-related topics, economic and environmental topics do not suggest any particular pattern. The frequency of economic articles seems to decrease until around 2012, but after that, an increase follows. Environmental articles seem to occur without any particular fluctuation. The figure also clearly depicts the difference in coverage, showing the less frequent occurrence of environmentally-oriented articles. For comparison, the figure also visualizes the frequency of the topic on environmental impacts (topic "environment_ecology" in Table 7). This topic is depicted in bright green. The discrepancy between the overall frequency of environmental topics and the frequency of the topic "environment_ecology" suggests that environmental coverage is predominantly related to direct mitigation of adverse local impacts, specifically the reclamation of mined-out areas. Topics that address the emissions of greenhouse gases from mining, the impact of (coal) emissions on global warming, or similar discussions simply do not emerge. This neglect of the climate change issue is consistent over time. The frequency of the whole environmental category does not increase over time, even at times when important international events (e.g., international summits on climate change mitigation) had taken place. This is true despite the fact that the utilization of coal is a significant source of the Czech CO_2 emissions as well as other pollutants, as pointed out in the introduction. The qualitative sample demonstrates this clearly. Articles in the sample predominantly cover the process

Figure 6 – Tagged articles: the "economy," "environment," and "limits" themes



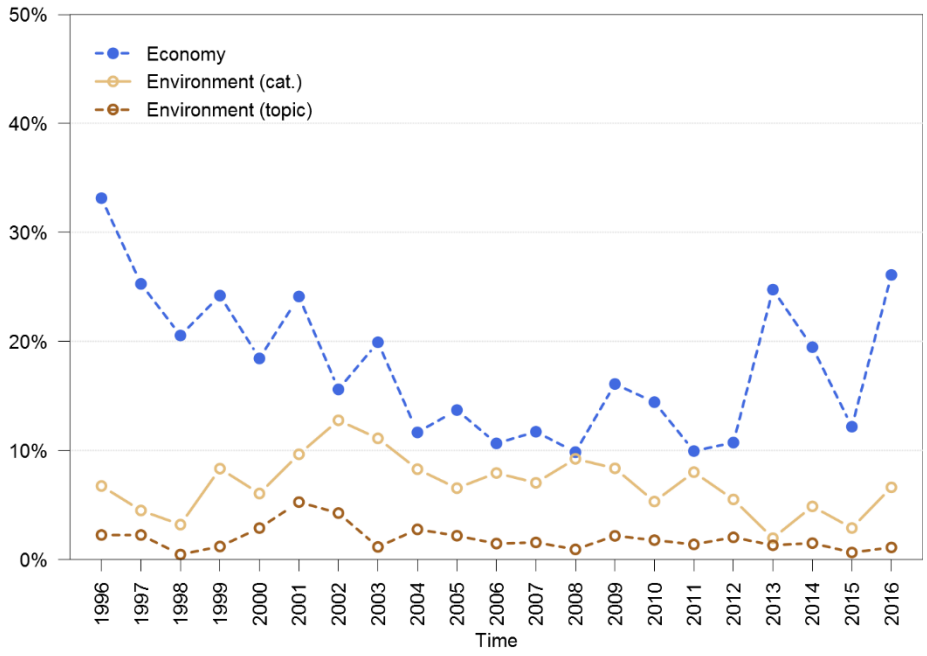
of reclamation of mined-out areas and former mining landscapes, e.g. flooding of open-cast mines. The negative impacts of mining (e.g., landslides, waste from mining and associated heavy industry) and potentially high costs of landscape revitalization are also covered, suggesting that even ecological themes are discussed from the economic point of view. At the same time, the potential of post-mining localities is discussed, for example, the use of former mining areas as new tourism locations.

The absence of discussion about the question of climate change is striking. It contradicts other studies on climate change representation in the media. Jari Lyytimäki has shown that news is mainstreaming the climate change issue. "Mainstreaming" means that the question is being included in many seemingly unrelated domains, which are consequently framed as climate-related (Lyytimäki, 2011). Angela Oels pointed out that even questions of hard security have been framed as related to climate change. She calls this process the

"climatization" of security (Oels, 2012). Moreover, comparative research has shown that media coverage of climate change is loosely proportional to pressure on mitigation efforts (Schmidt et al., 2013). However, this does not seem to be the case of coal mining reporting in the Czech Republic. On the contrary, results show that discussion on coal mining is largely decoupled from the discussion on climate change. The media approach this issue as if coal extraction was a separate domain, having no impact on climate change at all. In line with Olausson's reasoning (Olausson, 2009), we may hypothesize that this is caused by the discrepancy between the local and national perspectives in which the media usually operate, and the global long-term effects of climate change. The uncertainty over the causes of climate change results in an adaptation of issues as if they were purely national, governed within boundaries of national islands, or in their partial omission (Olausson, 2009). Boykoff and Boykoff argued that journalistic norms, such as the drive for fairness, objectivity, and balance, as well as the requirement for novelty, introduce bias into the media coverage of climate change. They claim that, due to the requirement for balance, climate skeptics are overrepresented in the media discourse in spite of their insignificant position in the scientific and expert discourse (Boykoff & Boykoff, 2004, 2007). In the case of coal mining, we may speculate newspaper editors may perhaps see the inclusion of environmental themes as imbalanced coverage. This question is warranted by some observations that the Czech public discourse is increasingly wary of the environmental movement, and "environmentalism" is perceived as a stigma (Krajhanzl, 2016).

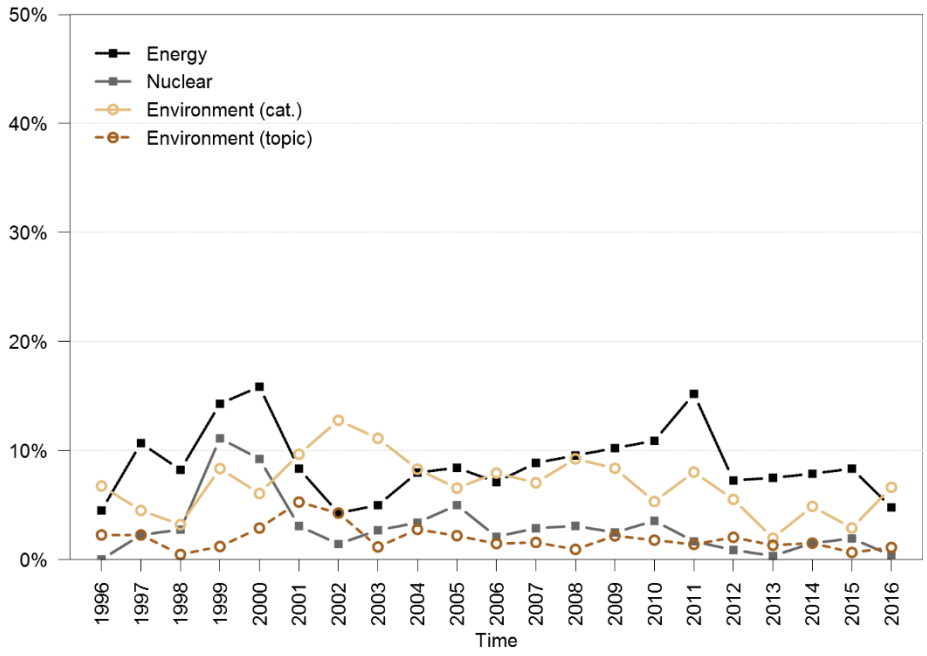
Figure 8 depicts the frequency of articles falling under energy-related topics compared to environmentally-oriented articles. The black line demonstrates all energy-related topics subsumed under the "energy" category. The gold line highlights a single topic – that of nuclear power. There is a surge of energy topics around the year 2000. This might have been caused by the nuclear-related topic. We depicted the topic in the figure, and this observation seems to be corroborated – the "nuclear" topic constitutes a large share of the "energy" category

Figure 7 – Tagged articles: the "economy" and the "environment" general categories, as well as the more specific the "environment_ecology" topic



in the year 2000. This might suggest that the upsurge was caused by the discussion of the NPP located at Temelín, which became operational that year. The commissioning of the two blocks of the plant was highly controversial at the time, causing strong negative response from both local environmental groups and Austria, which rallied against the nuclear power plant. Austria had even threatened it would prevent the Czech accession to the EU if the plant were to become operational (Hloušek et al., 2004). However, there was no spike in the media coverage of the nuclear topic around the time when the Fukushima disaster happened, nor later, when the tender on the Temelín expansion was being negotiated and later broken off by the Czech government; however, there was a surge in the frequency of energy-related articles around 2010 and 2011. This suggests that despite the importance of the issue of viability of nuclear power (Osička & Černoch, 2017), the salience of the nuclear issue became lower within the context of coal mining.

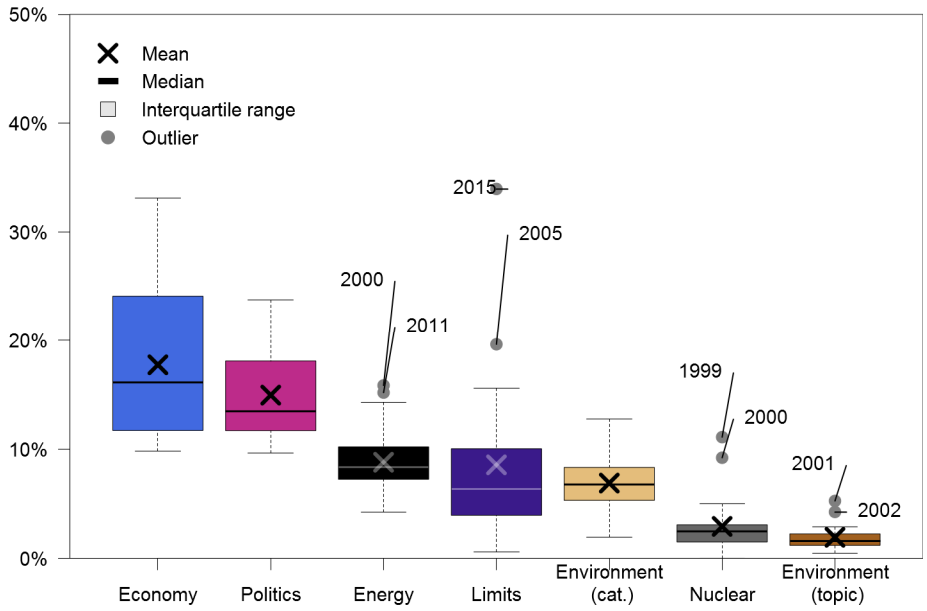
Figure 8 – Tagged articles: "energy" category, "environment" category, "energy_nuclear" topic and "environment_ecology" topic



It is useful to point out that unlike the discussion on climate change, discussions of energy issues or nuclear power plants indeed are connected to coal mining in the media. These observations are also corroborated in the qualitative sample, where energy-related topics connect coal mining with nuclear energy in various contexts. Nuclear energy is portrayed as a substitute for coal. In older articles published at the time of the commissioning of Temelín, nuclear is even portrayed as a means for improving the local environment as it leads to less mining and thus lower emissions in Northern Bohemia. Apart from this, the sampled articles under the energy theme cover heating, energy prices, state energy policy, but also concerns about sufficient supply of electricity due to the decline in mining.

The variation of coverage in all categories over time is captured in the boxplot chart in Figure 9. Spikes in the coverage of the Limits in 2005 and 2015 are clearly visible – these appear as outliers, far exceeding the average coverage.

Figure 9 – Tagged articles: temporal variation of frequency in categories and selected topics



The same can be said in the case of the "energy" category in 2000 and 2011. Spikes in the coverage of nuclear issues are visible in 1999 and 2000 (Temelín NPP). In the case of the purely environmental topic of "ecology," spikes appear in 2001 and 2002. However, these spikes are misleading, as these outliers are caused by extremely low coverage in the previous figures.

It is very interesting that the security framing of energy did not emerge from the data. The missing dimension of energy security in the media agenda contradicts the fact that the State Energy Policy stresses the security dimension. A strong appeal to security appears in the document, which cites the maximization of energy independence among the driving principles of its energy policy (Vlček &

Černoch, 2013). Since coal is the only commodity widely available in the country, this in turn means the preservation of coalmining activities (Ministry of Industry and Trade, 2015), or as the Raw Minerals Policy suggests, safeguarding the future capability to mine coal domestically (Ministry of Industry and Trade, 2017). In addition to that, the security of the supply of commodities (such as coal or gas) appears very often in the narratives of Czech representatives, as well as within the wider region (Osička et al., 2018).

SECTION 4

LOCAL OPPOSITION IN A RELATIONAL PERSPECTIVE

The development of modern societies is conditioned by ever growing complexity of infrastructure and land-use developments that unequally impact various stakeholders. This generates webs of collaborative as well as conflictual interactions among the stakeholders who struggle to preserve their interests across scales and jurisdictions. The opposition to land-use projects is an integral part of these contested processes where diverse actors, especially local communities and more broadly self-mobilized citizens, oppose local developments of various types, ranging from repositories of nuclear waste, through coal mining sites, to parks (Lake, 1987). The instances of local opposition in energy field have become highly visible at least since the beginnings of 1960s when an anti-nuclear social movement in the United States emerged (Daubert & Moran, 1985). Such contentions actions are, of course, not limited only to particular energy sources and particular types of energy infrastructures but can be observed across them (Ansolabehere & Konisky, 2009). The ongoing energy transition documents that local opposition frequently contests not only fossil fuels projects but also the "safe and clean" renewable energy sources (Devine-Wright, 2011; Fröhlingsdorf, 2011).

Local opposition thus soon became a burgeoning research area especially in field of environmental sociology (Devine-Wright, 2005; Ocelík et al., 2017) where it has been initially understood as a set of protectionist attitudes among local residents toward, often socially beneficial, site-specific projects (Burningham et al., 2006), a description labeled as the so called "not-in-my-backyard" (NIMBY) syndrome or framework. An influential definition of the NIMBY was coined by

Michael Dear (Dear, 1992): "*NIMBY refers to the protectionist attitudes of and oppositional tactics adopted by community groups facing an unwelcome development in their neighborhood.*"

Nevertheless, such view suffers from significant analytical, normative, as well as practical limitations and has been shown as empirically unsupported (Bell et al., 2005; Burningham et al., 2006; Devine-Wright, 2007; Gibson, 2005; Wolsink, 2000). Better understanding of the phenomena is thus required in order to effectively engage with all three dimensions. More specifically, it is argued that the NIMBY framework is *analytically* insufficient since it does not account for social as well as discourse structures which are considered crucial for mobilization and participation processes (Diani, 2003b). Second, it places a *normative* burden on the opposition actors by *a priori* assumptions of the public vs. private (local) interest's distinction and the agency based on a self-interested instrumental rationality. Third, resulting distorted image of local opposition does not allow to design policies that would facilitate efficient and legitimate negotiations of the stakeholders and, eventually, *practical* implementation of the project. All these reasons make the study of local opposition relevant not only to policy making, but also to a broader process of stakeholder management.

This section is organized as follows. It starts with discussion on the concept of local opposition that juxtaposes the NIMBY framework and the *relational approach* with a focus on the *social structure* and *discourse structure* layers of the local opposition. Special emphasis is paid to providing a comprehensive description of the core assumptions and concepts of Social Network Analysis. The chapter summarizes and contextualizes findings from the case studies based on the pre-prints of the articles *Beyond our backyard: Social networks, differential participation, and local opposition to coal mining in Europe* (Ocelík et al., 2021) and *Anti-fossil frames: Examining narratives of the opposition to brown coal mining in the Czech Republic* (Černoch et al., 2019).

Local opposition: The NIMBY syndrome and beyond

The beginnings of systematic examination of local opposition are closely linked to the NIMBY framework. It assumes a situation in which local residents accept a project or technology in general but they tend to oppose it when a particular project is to be sited in their proximity (Černoch et al., 2019). Another variant of this reasoning replaces the local residents' general acceptance of a project or technology *with general public acceptance* which is, however, opposed by the residents (van der Horst, 2007). Bell et al. (Bell et al., 2005) elaborate this distinction through concepts of a *social gap*, the latter, and *individual* gap, the former.

The two types of explanations are provided here: *collective action problem* and *limited participation problem* (Bell et al., 2005; Černoch et al., 2019). A *collective action problem* refers to a situation where individual-based incentives prevent cooperation on socially optimal outcome (Olson, 1971). In line with the argument, the local opposition results from individually rational calculations where expected individual costs exceed expected individual benefits which leads to a collective (social) loss. Free-riding is a specific case of such problem where individual consumers are not willing to share the costs of the supplied commodity (Feldman & Turner, 2014). Following this reasoning, although the coal mining expansion might be socially desirable outcome that produces public good, local residents, as rational individuals, are incentivized to free-ride.

The *limited participation problem* assumes that local opposition is driven by a dysfunctional decision-making process. Bell at al. (Bell et al., 2005) further differentiate two specific path-ways. First, *democratic deficit* pathway assumes that whereas majority of a public supports the project, the decision-making is targeted and blocked by an organized minority of highly motivated opponents.

Second, *qualified agreement* pathway then assumes that it is difficult to reach a majority acceptance if reservations and modifications that address potential harmful impacts of the project are not considered and included (Bell et al., 2005). Besides, Schively (Schively, 2007) differentiates the NIMBYs based on their impacts into two types. First type is defined by concerns about living quality and property value impacts, second type refers to concerns related to environmental and health impacts (Schively, 2007). Although Bell et al. (Bell et al., 2005) formulate these pathways as alternative explanations to collective action problem, they admit that these arguments can be used also as tactical maneuvers to cover opponents' self-interested motivations. Likewise Wolsink (Wolsink, 2000) argues that the NIMBY results from a combination of "positive attitudes", such as a perceived visual quality of the project, and egoistic incentives (Ocelík, 2015).

A third approach, contrary to the previous ones emphasizes *affective drivers* of local opposition and explicitly involves normative reasoning. Badera and Kocoń (Badera & Kocoń, 2015), for instance, argue that local elites use concept of *moral panic* as a mobilization tool. A moral panic unreasonably and exaggeratedly portrays particular events or social actors as threats to societal values and interests (Badera & Kocoń, 2015). This consequently leads to major socioeconomic and even political losses (Badera & Kocoń, 2015).

The abovementioned can be summarized into two characteristics that are common to most, if not all, of the NIMBY approaches: a largely implicit *normative appeal* that delegitimizes local opposition and assumption of a *homogeneity of independent individuals* (Černoch et al., 2019). The former refers to the "descriptions" of the local opposition that range from freeriding rational actors or a self-interested minority that pushes forward its interests at the expense of "silence majority", through ignorant and irrational individuals to over-emotional and anti-progressive forces that sometimes threaten not only local developments but even democratic governance as such (Burningham et al., 2006;

Černoch et al., 2019; Gibson, 2005; Ocelík et al., 2017; Schively, 2007). Thus, the NIMBY can be effectively used to delegitimize and stigmatize local opposition. In response, Schively (Schively, 2007) interestingly points at the potential re-framing of the NIMBY label which makes a connection to participatory and inclusive models of governance (Ocelík et al., 2017) where engagement of self-organized citizens, local communities, or marginalized groups empowers them against the competing interests of more powerful actors (Gibson, 2005). Gibson (Gibson, 2005) then criticizes a deep-rooted practice where project investors are typically depicted as "reasonable" actors promoting "public interest" and, at the same time, argues that emotional articulation of local opposition's arguments does *not* prevent them to represent the public interest.

Despite the conceptual vagueness of the NIMBY framework, it is possible to identify an underlying idea that defines the nature of its agency. More specifically, the different NIMBY explanations rest on assumption of a *homogeneity of independent individuals* who follow *a singular logic of action*. As argued by Černoch et al. (Černoch et al., 2019), in a narrow sense of rational choice theory, it corresponds with the *utilitarian* notion of *homo economicus* where actors' actions result from their cost-benefit calculations. Besides, there can be other, non-utilitarian, types of incentives that guide actors' actions including *cognitive-based*, such as a lack of knowledge (Bell et al., 2005) and distorted perception of risks (Kraft & Clary, 1991), and *affective-based*, such as irrational fear and moral panic (Badera & Kocoń, 2015). Importantly, the NIMBY framework neglects actors' interdependencies in terms of their embeddedness both within the social network structures (Ocelík et al., 2021) and prevailing frames (Ocelík et al., 2017) of the contested projects which, in effect, challenges also *spatial* homogeneity of the local opposition.

The NIMBY framework criticism stipulated emergence of wide variety of approaches challenging its core assumptions or/and focusing on omitted factors that are hypothesized to influence local opposition and public acceptance dynamics. In this context, Devine-Wright offers a comprehensive overview of

the debate where he recognizes (1) *sociodemographic*, (2) s*ociopsychological*, and (3) *contextual* types of factors (Devine-Wright, 2007). The first two types, sociodemographic and sociopsychological factors, are based on explanations where participation is driven by *individually-held* attitudes. As for the former, these include age, gender, education, and socioeconomic status. In general, sociodemographic characteristics are considered to be important drivers of protest participation, with young to middle-aged men being the most prone to participate (Context Matters: Explaining How and Why Mobilizing Context Influences Motivational Dynamics, 2009). As for the latter, participation is assumed to be driven by *degree of awareness and understanding* (how much individuals know about the project), *political beliefs* (traditional right-left socioeconomic cleavage), *environmental beliefs and concern*, *place attachment* (a positive emotional link to a familiar location), and *perceived fairness* of the decision-making process and *level of trust* among stakeholders (Devine-Wright, 2007).

Devine-Wright (Devine-Wright, 2007) argues that empirical studies typically indicate complex interactions among several of the factors and a substantial case context-dependence of the results. This contradicts a single logic of the NIMBY explanations and, more importantly, points at the *contextual factors* which further gain on relevance if the so-called *value-action gap* (Blake, 1999), i.e. a situation where actors' actions do not correlate with their values, is considered. Contextual factors then include *technological factors* that reflect nature and type of contested technologies or projects, *institutional factors* ranging from formal ownership structures to less formalized or informal cost distribution, mobilization and participation processes, and *spatial factors* that reflect regional and local specifics as well as include the "NIMBY variable" or spatial proximity (Devine-Wright, 2007). In similar fashion, Kemp (Burningham et al., 2006) stresses that interplay of contextual factors promotes particular forms of reasoning and participation in local opposition.

The relational approach: Discursive and social structure layers

This is a departure point for the two presented case studies that further explore importance of relational structures, specifically frames and social networks. Before that, meta-theoretical framework grounded in *social constructivism* and *relational perspective* is introduced.

The *social constructivism* posits that social world primarily consist of and is driven by immaterial objects – ideas, and as such rests on idealist ontology. The societies are being structured through processes of social construction where social and institutional facts, such as gender roles or political institutions, emerge, reproduce, change, and decline based on shared (intersubjective) understandings. These structures shape actors' identities that allow them to orient themselves and interact with others, while are being, at the same time, instantiated as emergent products of actors' routinized interactions (Searle, 1997). In this perspective, the social reality is intelligible to us through durable patterns of different types of interactions such as *social ties* or *conversations* that constitute the central staff of social life (Tilly & Tarrow, 2007).

The importance of *mutually constitutive relations* between the actors and structure is further underlined by the *relational perspective* (Emirbayer, 1997). Such perspective seeks processual understanding in which outcome, actors, and relations are endogenous (Abbott, 2007). In other words, it refuses methodological individualism which assumes that social reality results from a multiplicity of interactions among more or less independent actors with particular fixed properties. Relation perspective, in contrast, argues that individual actions of the actors are enabled only within a particular transactional context, i.e. structure of relations that is constitutive to social reality (Emirbayer, 1997). For

instance, power is not understood as an individually-held attribute of specific actor, but rather as *position* within a specific configuration of relations that actor may take (Ocelík, 2015). The focus is further on *discursive* and *social structure* layers. The former forms around broad topics through institutionalized uses of language by multiplicity of actors (Davies & Harré, 1990), the latter emerges from localized and, more or less, stable actors' interactions (Lusher et al., 2012).

As Fischer and Forester argue, the discursive layer is made of conversations of diverse actors that struggle to set "*the criteria of social classification, the boundaries of problem categories, the intersubjective interpretation of common experiences, the conceptual framing of problems, and the definitions of ideas that guide the ways people create the shared meanings which motivate them to act*." (Fischer et al., 1993) Hence, dominant discourses define what is considered to be true and accordingly (de)legitimize related institutional arrangements (Hajer, 1997). Social actors thus often use language *strategically* to (re)frame particular issues in a way that promotes their interests and thereby compete to establish a dominant discourse that would close the controversy in their favor (Černoch et al., 2019). Frames are then understood as share "*interpretative schemata*" used by actors to "*simplify and condense the 'world out there'*" (Snow & Benford, 1992) by highlighting particular parts of reality while suppressing others. Framing is thus essential also for mobilization and participation processes, where "*collective action frames*" provide "*sets of beliefs ... that inspire and legitimate the activities and campaigns*" (Benford & Snow, 2000). Since actors, typically, cannot establish a dominant discourse on their own, they tend to form coalitions around a particular shared set of ideas (Hajer, 1993). Hajer (Hajer, 1993) coined a concept of *discourse coalition* defined as a "*group of actors who share a social construct*". These assumptions are further explored in the separate section.

The social structure layer consists of patterns of various kinds of relations, such as professional or friendship relationships, affective ties or organizational affiliations, among various actors (Wellman & Berkowitz, 1997) – or, in other words, it is constituted by different types of social networks. In this context,

Lusher et al. (Lusher et al., 2012) formulate assumptions underlying social networks formation. First, social networks *emerge through actors' local interactions* such as information exchange among particular individuals. Second, network ties are organized by endogenous and exogeneous mechanisms. The former refers to *network-self organization* processes where likelihood of the presence (or absence) of the tie might be solely dependent on presence (or absence) of other ties. For instance, reciprocity mechanism assumes that if actor A sends information to actor B it creates an incentive for actor B to send information to actor A regardless of the actors' individual attributes. The latter refers to *external processes* which influence tie formation within the network. For instance, homophily mechanism assumes that there is an increased likelihood of the tie formation between a pair of actors who share particular property (such as political affiliation). Third, the abovementioned allows to assume that social networks typically emerge through *multiple operating processes* – for example, reciprocity and homophily can reinforce each other. Fourth, the *observed patterns*, such as number of reciprocated ties, within the networks can be seen as evidence of these ongoing processes. Five, social *networks are structured, yet stochastic*; meaning that randomness is involved in all tie formation processes (Lusher et al., 2012).

In the context of collective action, social networks can be seen as complex structures that facilitate and/or constrain the mobilization and participation processes of various actors engaged in (local) opposition (Ocelík et al., 2021). Thus, in line with the relational perspective, the network properties, i.e. specific patterns of relationships (such as clustering of the network), are considered to influence actors' actions typically more than their individual attributes (such as age or gender). These assumptions are further explored in the following section.

Social networks analysis

Social network analysis (SNA) is a methodological framework (Wasserman & Faust, 1994), which rests on a meta-theoretical assumption that social world is relationally organized (Wellman & Berkowitz, 1997). Social reality emerges from multiplicity of relations among mutually unreducible phenomena (*relata*) (Schneider, 2015). Thus, examination of relational mechanisms and their effects in particular empirical contexts where they operate constitutes the core of SNA research (Knoke & Yang, 2008). Knoke and Yang (Knoke & Yang, 2008) formulate three foundational assumptions of SNA. *First*, observed behavior is shaped *primarily* by structural relations. Network self-organization, such as triadic closure (*a friend-of-my-friend-is-my-friend*), thus typically overweight importance of the actors' individual attributes such as gender or ideology. *Second*, network structures influence perceptions, beliefs, and actions through multiple mechanisms that are socially constructed by interactions among actors. Actors are thus being influenced through their embeddedness within the network structures – or, in other words, by changes in others' actions. *Third*, structural relations evolve over time through actors' interactions and networks thus cannot be considered as static. The triadic closure is an instance of such processes where an actor closes the triangles by linking its neighbors' connections. This mechanism is assumed to produce cohesive subgroups which enhance social trust and control (Knoke & Yang, 2008). Network structures can be approached by formalized as well as interpretative research strategies (Domínguez & Hollstein, 2014). As Carrington (Carrington, 2014) argues, social network analysis is "*neither quantitative nor qualitative, nor a combination of the two, rather it is structural*" (in the abovementioned sense). This section focuses on quantitative SNA.

Social network is operationally defined as a structure that *consists of (at least one) set of nodes (social actors) and (at least one) set of relations among the nodes* (Wasserman & Faust, 1994). A graph is mathematical representation of the network. There are various types of networks whose definitions differ based on properties of ties (orientation, weight, and valence), number of sets of nodes, number of sets of ties, constraints that define how ties can be defined, and other parameters.

This section covers basic concepts and measures for *undirected* and *directed binary unipartite networks* – i.e., networks that consist of one set of nodes and one set of unweighted ties. A common way how to mathematically conceptualize unipartite networks is using *adjacency matrices* (see Table 9). The rows and columns of the adjacency matrix represent nodes and a cell value in row *i* and column *j* represents a tie from node *i* to node *j*. For unweighted networks represented by matrix M holds that $m_{ij} = 1$, if a tie from node *i* to node *j* is present, and $m_{ij} = 0$ otherwise. Typically, self-loops or reflexive ties (ties from nodes to themselves) are not allowed; for instance, reflexive cooperation ties are not meaningful. In this case, all diagonal values are by definition set to zero. For undirected networks, a matrix upper triangle and lower triangle are identical, the matrix is thus symmetric. By convention, rows represent outgoing (or sending) ties, whereas columns represent incoming (or receiving ties) in directed networks (Borgatti et al., 2018).

The matrices as used for network visual representations (see Figure 10 as visualization of Table 9) as well as calculation of network measures (Borgatti et al., 2018). Network visualizations can be useful, although rather complementary, tools for exploration of a network structure. Nevertheless, visualizations might be also misleading especially for larger and more complex networks. In general, it is thus not advised to make interpretations only based on them.

Table 9 - Adjacency matrix

	A	B	C	D	E	F	G	H
A	0	1	1	1	0	0	0	0
B	1	0	1	1	1	0	0	1
C	1	1	0	1	1	0	0	0
D	1	1	1	0	0	1	0	0
E	0	1	1	0	0	0	1	0
F	0	0	0	1	0	0	0	0
G	0	0	0	0	1	0	0	0
H	0	1	0	0	0	0	0	0

Figure 10 - Visualization of adjacency matrix

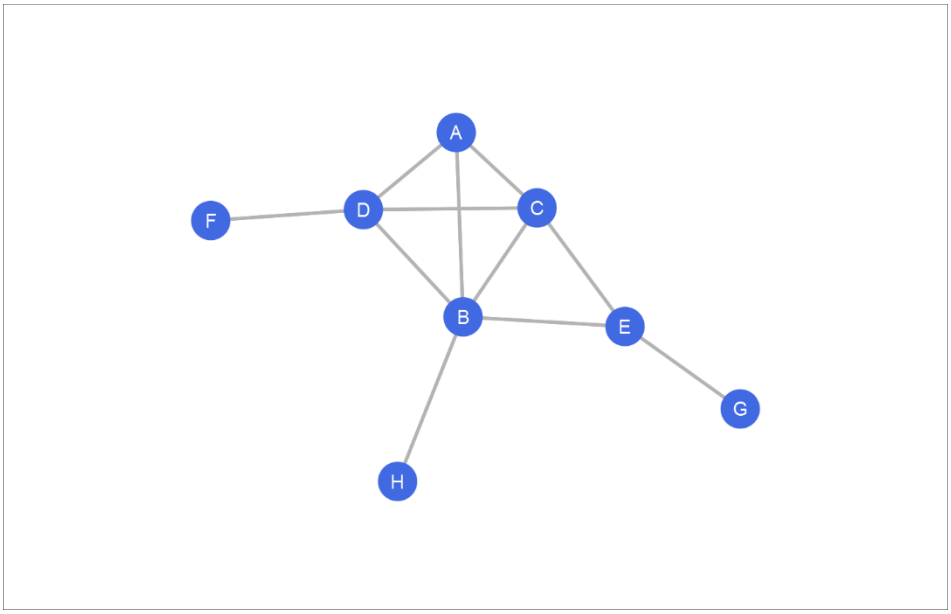
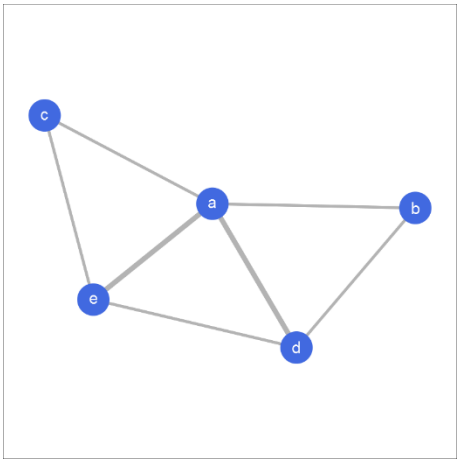


Table 10 - Adjacency matrix of co-affiliation network

	a	b	c	d	e
a	3	1	1	2	2
b	1	1	0	1	0
c	1	0	1	0	1
d	2	1	0	2	1
e	2	0	1	1	2

Figure 11 - Row-based one-mode projection: co-affiliation network



The complexity of the social world sometimes cannot be captured in unipartite networks. Thus, it might be useful, for instance, to capture affiliations between individuals and organizations in bipartite networks. A *bipartite network* consists of two disjoint sets of nodes and a single set of ties allowed only between these two sets of nodes. A bipartite network is represented by an incidence matrix (see Table 11). The rows of the incidence matrix represent first mode (individuals) and the columns represent second mode (organizations) and a cell value in row *i* and column *j* represents a tie from the first-mode node *i* to the second-mode node *j*. Thus, if a tie from node *i* to node *j* is present, the cell value equals 1; otherwise, it equals 0. Moreover, bipartite networks can be transformed to two one-mode projections. First, the row-based one-mode projection produces a unipartite network where individuals are tied through their organizational co-affiliations. Second, the column-based one-mode projection produces a network where organizations are tied through individual co-memberships. Technically, one-mode projections are produced via matrix multiplication procedure. The original incidence matrix is multiplied by its inverse to produce the row-based one-mode projection. To produce the column-based one-mode projection, the inverted matrix is multiplied by its original form. In our example, the bipartite network consists of 5 individuals {*a*, *b*, *c*, *d*, *e*} and 3 organizations {A, B, C} and

undirected ties between them (see Figure 12). The resulting row-based one-mode projection (i.e., individuals' co-affiliation unipartite network) is displayed in Figure 13 and represented by the adjacency matrix in Table 12.

The resulting column-based one-mode projection (i.e., organizations' co-membership unipartite network) is displayed in Figure 14 and represented by the adjacency matrix in Table 13. Note that there are weighted ties in both one-mode projections. The weights reflect the number of connections to the other node set (organizations) that the two nodes (e.g., activists) share. For instance, activists *a* and *d* are both affiliated to organizations A and B. Thus, they share two organizational affiliations, and the corresponding tie weight is 2. Likewise, organizations B and C are both affiliated with activists *a* and *e*. Thus, they share the memberships of the two activists, and the corresponding tie weight is 2. Note also that diagonals have non-zero values. The diagonal values in one-mode projections refer to the sum of the observed connections a given node has in the bipartite network. For more details on the analysis of bipartite networks as well as the one-mode projections and related issues, see Borgatti et al. (Borgatti et al., 2018).

Table 11 - Incidence matrix

	A	**B**	**C**
A	1	1	1
B	1	0	0
C	0	0	1
D	1	1	0
E	0	1	1

Figure 12 - Bipartite network

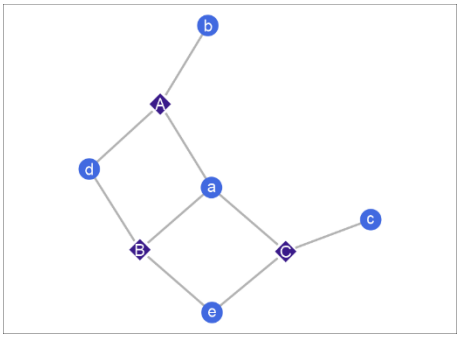


Table 12 - Adjacency matrix of co-affiliation network

	a	b	c	d	e
a	3	1	1	2	2
b	1	1	0	1	0
c	1	0	1	0	1
d	2	1	0	2	1
e	2	0	1	1	2

Figure 13 - Row-based one-mode projection: co-affiliation network

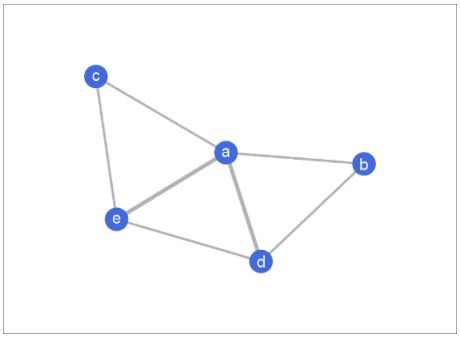
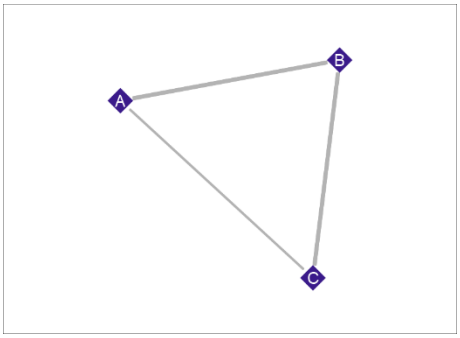


Table 13 - Adjacency matrix of co-membership network

	A	B	C
A	3	2	1
B	2	3	2
C	1	2	3

Figure 14 - Column-based one-mode projection: co-membership network



Quite often it is necessary or useful to simplify network data. Binarization (or dichotomization) and symmetrization are two widely used operations that enable such data reductions. *Binarization* refers to a procedure whereby originally weighted ties are changed to binary ties, typically with values 0 (absence of a tie) and 1 (presence of a tie). For instance, one-mode projections of bipartite networks of activists and organizations will include weighted ties with values larger than 1 if there are at least two activists sharing more than one organizational affiliation and/or at least two organizations with a joint membership of two or more activists. We may decide that only co-affiliation or co-membership ties (i.e., ties among activists or among organizations) with a value greater than 1 will be kept

for the analysis. This means that all ties valued at 1 will be changed to 0 (i.e., tie is absent), while all ties with a value greater than 1 will be changed to 1 (i.e., tie is present). Thus, if $m_{ij} > 1$, then $m_{ij} = 1$; otherwise $m_{ij} = 0$. In our example of the row-based one-mode project (see Figure 13), this process means that ties *a-b*, *a-c*, *b-d*, and *c-e* are removed as their original weight is 1 and only *a-d* and *a-e* with original weights of 2 are kept (see Figure 15 and Table 14). Furthermore, the diagonal values are changed to 0. Of course, the definition of the binarization threshold is an important analytical decision, which must be credibly justified. This typically also includes a sensitivity analysis to examine how the results change based on the selection of various binarization thresholds (Ocelík et al., 2021).

Figure 15 - Network binarization

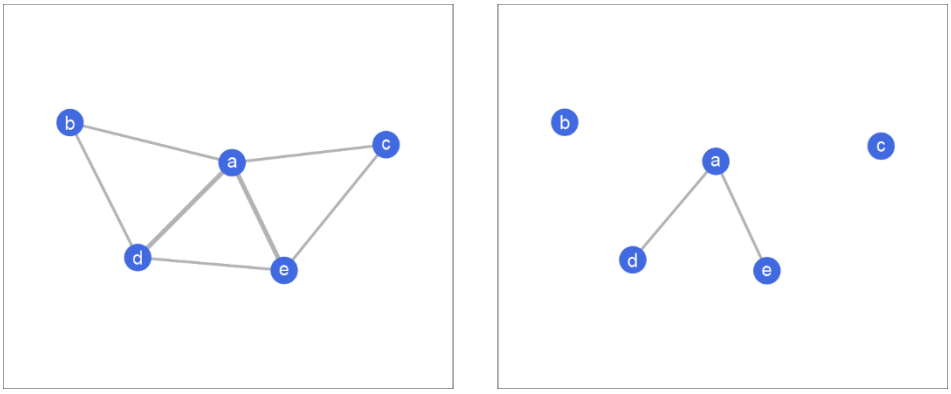


Table 14 - Binarized co-affiliation adjacency matrix

	a	**b**	**c**	**d**	**e**
a	0	0	0	1	1
b	0	0	0	0	0
c	0	0	0	0	0
d	1	0	0	0	0
e	1	0	0	0	0

Symmetrization can be performed only for directed networks and refers to a procedure where differing values in ordered pairs are changed to a single value – thus making the upper and lower triangle of the matrix symmetrical and changing the directed network to an undirected one. Symmetrization is often used for questionnaire data collected for relationships which are assumed to be mutual, such as collaboration. Nevertheless, in practice, we never obtain symmetrical matrices reconstructed based on questionnaire responses due to noise in the data (differing perceptions of the respondents, recall errors, etc.) and other factors. In our example (see Figure 16 A), we can observe that activist B reports collaboration with activist D, but activist D does not report collaboration with activist B. After symmetrization, we change the B-D relationship to an unorder pair with either present or missing tie, depending on the symmetrization method used. The two most used methods are symmetrization over the minimum (or strong symmetrization, Figure 16 B) and symmetrization over the maximum (or weak symmetrization Figure 16 C). To illustrate, let us use a binary directed network with 4 nodes {A, B, C, D} and 6 ties A-B, A-C, B-A, B-D, C-A, C-B (see Table 15 A). For symmetrization over the minimum, we use the smaller value within the ordered pair to replace the larger one. Thus, for ordered pair {C, B} we initially have values of 1 for C-B and 0 for B-C (see Table 15 A). After applying symmetrization over the minimum we are left with an unordered pair with an absent undirected edge (0) (see Table 15 B). For symmetrization over the maximum, we use the larger value to replace the smaller one within the ordered pair. Thus, for the same ordered pair {C, B}, symmetrization over the maximum yields an unordered pair with a present edge (1) (see Table 15 C). As with binarization, symmetrization is an important analytical decision which must be credibly justified (Mazák et al., 2017). This typically also includes a sensitivity analysis to examine how the results change based on the different symmetrization methods.

Table 15 - Adjacency matrix symmetrization

A - original adjacency matrix of the directed network

	A	B	C	D
A	0	1	1	0
B	1	0	0	1
C	1	1	0	0
D	0	0	0	0

B - symmetrization over the minimum

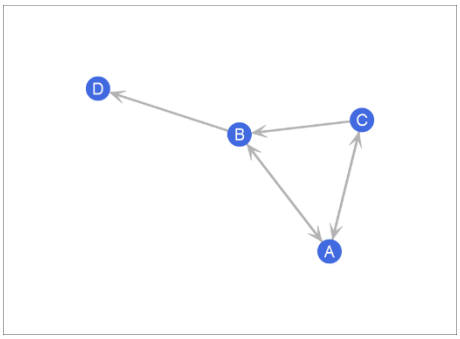
	A	B	C	D
A	0	1	1	0
B	1	0	1	1
C	1	1	0	0
D	0	1	0	0

C - symmetrization over the maximum

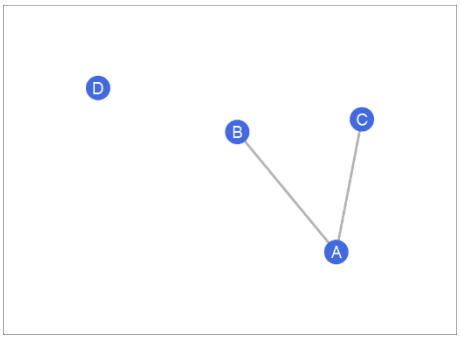
	A	B	C	D
A	0	1	1	0
B	1	0	0	0
C	1	0	0	0
D	0	0	0	0

Figure 16 - Network symmetrization

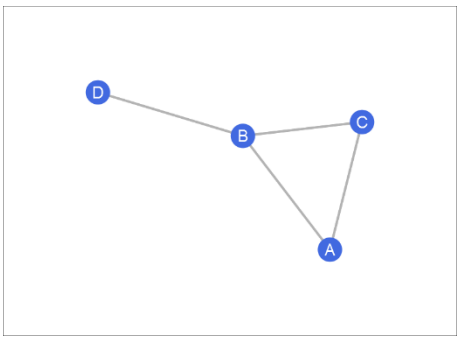
A - original directed network



B - strongly symmetrized network



C - weakly symmetrized network



A network topology (network shape) is described by two main analytical categories: *connectivity* and *centrality*. The move along a tie between two nodes is called a step. A walk is any sequence of steps. A path is a sequence of steps where each node and each tie can occur just once. A shortest path (or geodesic) is a path with the least number of steps. An undirected tie is called an edge; a directed tie is called an arc (Wasserman & Faust, 1994).

It is thus possible to examine direct as well as indirect connections between nodes and, consequently, measure *distances* between them. *Direct connection* refers to a situation where nodes (e.g., activists) are linked by a single edge in an undirected network. Such two nodes are *adjacent*. All nodes directly connected to a particular node then constitute its *neighborhood*. Directed networks, however, are more complex. For example, in Figure 17 we can observe an arc (directed tie) from activist A to activist B but not from B to A. Thus, A is adjacent to B, but B is not adjacent to A. Looking at the whole network including the three other activists (see Figure 17 and Table 16), we can also examine indirect connections among the five nodes. Let us assume that direct ties represent transmission of information.

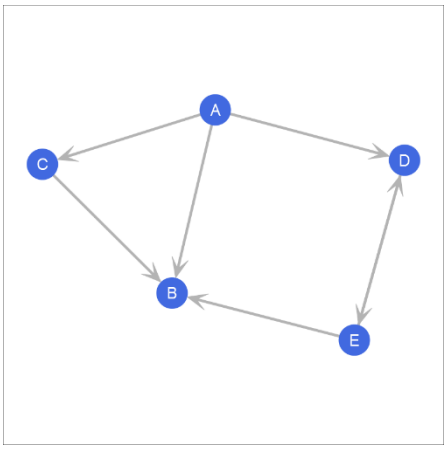
First, we can determine the *reachability* of the nodes. That is, whether there is, at least, a single shortest path (or geodesic) between the given node and the other nodes. For instance, node A has three ties, all outgoing. Thus, node A cannot be reached from any other node unless we neglect the direction. In contrast, node B with its three incoming ties can be reached from all the remaining nodes but cannot itself reach any other node. Such a network corresponds to a situation where activist A only sends information to others and receives none, while activist B only receives information and sends none. The reachability of the nodes can be expressed through a reachability matrix. For a directed network represented by reachability matrix R, hold that $r_{ij} = 1$ if a shortest path from node i to node j is present; otherwise, $r_{ij} = 0$. By convention, for directed networks we

distinguish between rows and columns. Thus, for our pair {A, B} we have r_{AB} = 1 and r_{BA} = 0 (see Table 17).

Table 16 - Adjacency matrix of activists' information exchange network

	A	B	C	D	E
A	0	1	1	1	0
B	0	0	0	0	0
C	0	1	0	0	0
D	0	0	0	0	1
E	0	1	0	1	0

Figure 17 - Activists' information exchange network



Second, we can determine *geodesic distances* among all nodes. For pairs with unreachable nodes, the geodesic distance is undefined (n.d.), or in statistical software often expressed as infinitely large. For pairs with reachable nodes, the geodesic distance is given by a walk with non-repeating nodes and edges containing the fewest steps — that is, by the shortest path. For instance, the geodesic distance from A to B is 1, while from A to D it is 2. As in the previous case, the geodesic distances among all nodes can be expressed through a geodesic distance matrix. For a directed network represented by geodesic distance matrix G, g_{ij} equals the number of steps in the geodesic. By convention, for directed networks we distinguish between rows and columns. Thus, for our pair {A, B} we have g_{AB} = 1 and g_{BA} = n.d. (see Table 18). The largest geodesic for a given node is called its *eccentricity*, and the largest geodesic in the network is called the *diameter*. In our example, the diameter value is 2.

Table 17 - Reachability matrix

	A	B	C	D	E
A	1	1	1	1	1
B	0	1	0	0	0
C	0	1	1	0	0
D	0	1	0	1	1
E	0	1	0	1	1

Table 18 - Geodesic distance matrix

	A	B	C	D	E
A	0	1	1	1	2
B	n.d.	0	n.d.	n.d.	n.d.
C	n.d.	1	0	n.d.	n.d.
D	n.d.	2	n.d.	0	1
E	n.d.	1	n.d.	1	0

Third, we can also calculate distance measures allowing to compare node profiles. A node profile is a row or column vector of the corresponding node. Such profiles or their subsets can be compared in various ways (Wasserman & Faust, 1994). The most common measures are Jaccard's coefficient and Euclidean distance. *Jaccard's coefficient* (see Lizardo, 2021) is defined as the intersection of the neighborhoods (adjacent nodes) of two nodes divided by the union of their neighborhoods. Since we have a directed network, it is necessary to distinguish between incoming neighborhoods and outgoing neighborhoods. The former refers to incoming neighbors – i.e., nodes directly connected by incoming ties; the latter refers to outgoing neighbors – i.e., nodes directly connected by outgoing ties. An intersection is observed if there is joint presence (but not joint absence) of a tie in the neighborhoods. For instance, the out-neighborhoods for activists A and E are {B, C, D} for A and {B, D} for E. Thus, the out-neighborhoods union of A and E is {B, C, D}, and both A and E have outgoing ties to B and D, which counts as an out-neighborhood intersection {B, D}. The value of Jaccard's coefficient is then {B, D} / {B, C, D} or 2 / 3 = 0.66. Again, we can calculate Jaccard's coefficient values for all ordered pairs and organize them in a matrix (see Table 19 and Table 20). The calculation is analogous for undirected networks – Jaccard's coefficient is calculated as the intersection of two nodes' neighborhoods divided by the union of the nodes' neighborhoods.

Table 19 - Jaccard's coefficient matrix: outgoing neighborhoods

	A	B	C	D
B	0	-	-	-
C	0.33	0	-	-
D	0	0	0	-
E	0.66	0	0.50	0

Table 20 - Jaccard's coefficient matrix: incoming neighborhoods

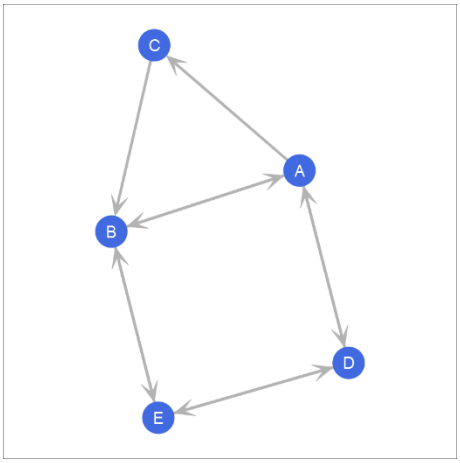
	A	B	C	D
B	0	-	-	-
C	0	0.33	-	-
D	0	0.66	0.50	-
E	0	0	0	0

Euclidean distance (ED) compares two nodes based on their distances to all other remaining nodes in the network (Wasserman & Faust, 1994). Recall that the distance of unreachable nodes is undefined. In case there are unreachable nodes, we can decide to exclude them from the calculation or use an alternative measure which is not so sensitive to the presence of unreachable nodes, such as Jaccard's coefficient. Here we use a modified version of our example where all nodes are mutually reachable (see Figure 18). Let us calculate the ED of nodes A and E. The calculation can be broken down into three main steps. First, we calculate the geodesic distances of A and E to all other remaining nodes {B, C, D}. Since the network is directed, we need to distinguish the order of the pairs. For instance, take pairs {A, C} and {C, A}. The corresponding geodesic distances are $g_{AC} = 1$ and $g_{CA} = 2$ (C-B-A). Second, we take the squared differences of the geodesic distances for all corresponding pairs involving A and E. Third, we sum the squared differences and then take a square root to return to the original units of measurement. For a more detailed explanation of the calculation, see Wasserman and Faust (Wasserman & Faust, 1994). As in the previous cases, ED values can be calculated for all ordered pairs and organized in a matrix (see Table 21).

Table 21 - Euclidean distance matrix

	A	B	C	D
B	2.23	-	-	-
C	1.41	1.73	-	-
D	2.24	0	1.73	-
E	1	2	1	2

Figure 18 - Modified activists' information exchange network



The calculation is analogous for undirected networks, where we do not distinguish the order of the pairs. Likewise, if ED values are organized into a matrix, the upper and lower triangle are identical (Wasserman & Faust, 1994).

Connectivity measures describe interconnectedness of the whole networks. Fundamental measure of connectivity (or cohesion) is network *density*. Density is the number of observed ties divided by a maximum number of ties possible in a network of such size (given by number of nodes). The possible number of ties is given by a total number of node pairs in the network defined by $n*(n - 1)$, where n represents the number of nodes, for ordered pairs (directed networks), respectively $n*(n - 1)/2$ for unorder pairs (directed networks). For more details see Wasserman and Faust (Wasserman & Faust, 1994).

Connectedness (sometimes called Krackhardt's connectedness) is defined as the proportion of pairs of nodes that can reach one other by any number of steps – thus, they have to be directly (1 step) or indirectly (2 and more steps) connected (Krackhardt, 1994). As Borgatti et al. (Borgatti et al., 2018) show, 1 minus

connectedness complementary represents network *fragmentation* which can be used to evaluate changes in the network after an intervention or external event.

Average local clustering coefficient is a popular measure of clustering in the network. It firstly measures embeddedness of individual nodes by calculating the density of their neighborhood (adjacent nodes). The average value for all nodes in the network is then a whole network measure (Watts & Strogatz, 1998). Reciprocity is defined as the proportion of reciprocated ties (typically multiplied by two since reciprocated tie consists of two arcs) to the number of reciprocated and non-reciprocated (asymmetrical) ties. Likewise, triadic closure or transitivity is measured as the proportion of the closed triangles to the number of closed and opened triangles. Nevertheless, there are different measurements of reciprocity and transitivity, for more information see Wasserman and Faust (Wasserman & Faust, 1994).

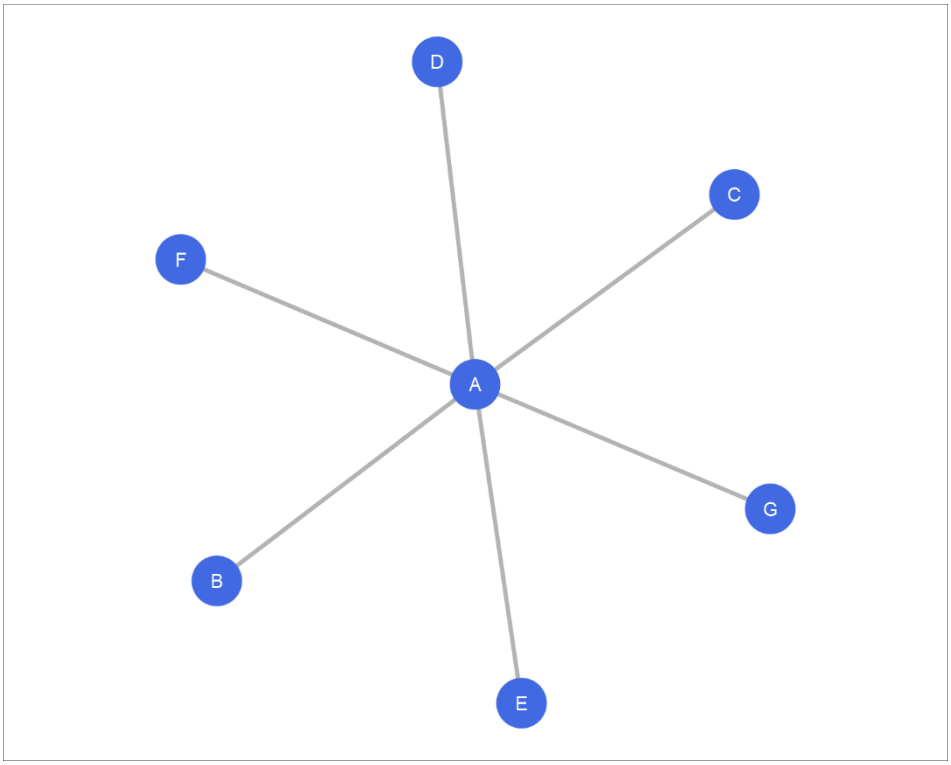
Centrality measures are local measures that focus on position of individual nodes within a network. *Centralization* measures are global measures that describe whole network properties based on distribution of individual centrality measures' scores (Wasserman & Faust, 1994). The concept of centrality builds on an idea that some nodes are due to their position more important for the overall connectivity of a network than the others. Freeman (L. C. Freeman, 1978) codified three basic measures of centrality: *degree*, *closeness*, and *betweenness*. Interpretations of centrality scores, same as other network measures, depend on nature of the network ties. *Degree* centrality is defined simply as the number of ties that a node has. For undirected network represented by a matrix M, it is sum of row or column values. For directed network, indegree and outdegree centrality scores and distinguished. The former is equal to a sum of column values, the latter to a sum of row values of the underlying matrix. *Closeness* centrality measures average shortest distance of a given node to all other nodes. More specifically, it is calculated as the reciprocal of the sum of the shortest paths between the node and all other nodes in the network. Closeness is typically interpreted as a potential

for efficient diffusion. *Betweenness* centrality measures how many times a given node lies upon a shortest path between any other two nodes. This number is then divided by a total number of shortest paths between all other nodes. Betweenness is typically interpreted as a potential for brokerage and flow control within the network. For directed networks, closeness and betweenness centrality are applied to their symmetrized matrices, i.e. underlying connected graphs. All three centrality measures are typically normalized by accounting for a size of the network which allows for comparisons across different networks (Wasserman & Faust, 1994).

Centralization measures the proportion of the observed variance of the centrality scores to a maximum possible variance of the scores within the network (Wasserman & Faust, 1994). High centralization, i.e. a situation where a few nodes have high centrality scores, is typically interpreted as indication of hierarchy and vice versa. A star configuration is an ideal type of such network that exhibits maximum possible variance in centrality scores (see Figure 19) and its degree, closeness, as well as betweenness centralization thus equals 1 (theoretical maximum). Another way how to explore network centralization is to plot centrality distributions – especially degree distribution is used as an indication of particular network properties. For instance, free-scale networks are extremely centralized since their degree distribution follows a power law (Barabási & Albert, 1999).

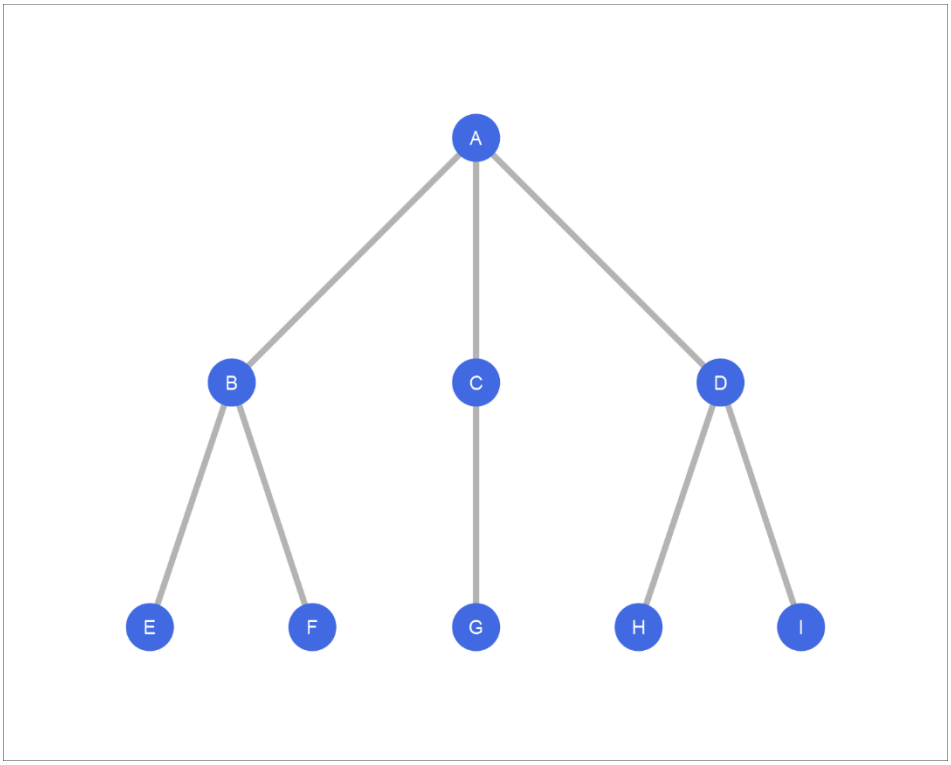
Positional analysis then looks for similarities between actors based on their position and offers various methods for their classification. It rests on idea that nodes which are connected to others through same patterns of ties are *structurally similar* and that such actors exhibit similarities in their behavior (Burt, 1976). Note that this is different from the cohesion-based measures that identify groups of *mutually* interconnected nodes. There are different ways how to measure structural similarity (Borgatti et al., 2018); one of the most used measures is

Figure 19 - Star configuration



Euclidean distance. *Euclidean distance* of a pair of nodes is given as the root square of the sum of the squared distances between them (Wasserman & Faust, 1994); if its value is a zero, then it means that the nodes are connected exactly the same way to the rest of the network or, in other words, they are *structurally equivalent*. This is the case of the pairs {E, F} and {H, I} in Figure 20. B and D are in *structurally automorphic* position since switching them would not change distribution of distances in the network. Lastly, nodes {A}, {B, C, D}, and {E, F, G, H, I} are similarly tied to the rest of the network and are thus in *structurally regular* position (Hanneman & Riddle, 2005).

Figure 20 - Structural similarity (Hanneman & Riddle, 2005)



Discursive and social structure layers of local opposition

As argued above, local opposition can be seen as relational phenomenon where actors actions are interdependent since they take into account how much others contributed to a collective action (Oliver et al., 1985). This is consistent with understanding of collective action as "*collectivities of individuals working together to realize a common goal usually through relatively noninstitutionalized means*" (Tindall et al., 2015). Frames (Benford & Snow, 2000) as well as inter-personal and inter-organizational networks then can be seen as structures that enable or constrain of the collective identities and that dis/incentivize mobilization and participation (Della Porta et al., 2015; Diani & McAdam, 2003).

Local opposition and collective action frames

At the discursive layer, opposition is seen as a product of rather complex interactions, where language and discourse play important (even crucial) role (Hajer, 1995). The opposition is to a large extent formed by the shared narratives, as well as ongoing "struggles over meanings, identities and interests" (Della Porta & Piazza, 2007). It is the particular aspects of narratives, which matter the most. Here, we turn to concept of frames and framing, introduced by Erving Goffman. Frames are constructed interpretive regimes, upon which one distinguishes actions of others. He terms such interpretive regime a "primary framework", which "allows its user to locate, perceive, identify, and label a seemingly infinite number of concrete occurrences defined in its terms". Primary frameworks may be natural and social. While natural frameworks are products of brute facts, social frameworks are given and negotiated culturally. This framing is occurring mostly unintentionally (Goffman, 1974). Even though Goffman provides general

sociological theory of framing, he points out that framing may be well present in the domain of verbal expression and framing mechanism may be traced via textual or verbal sources (Goffman, 1974). Tuchman cites Goffman, pointing to the fact that frames are important as they provide a scheme in otherwise fragmentary items of information or experience (Tuchman, 1978). Frames help to "make sense of new experiences, relating them to familiar assumptions about the way the world works" (Cox & Pezzullo, 2016). Gamson and Modigliani perceive frames as "organizing principles". They contain specific symbols, which suggest "positions in shorthand" (Gamson & Modigliani, 1989).

One of the most often cited definitions of framing comes from Entman, who attempted to define framing in the media research and offer a more conceptually clear representation of framing (Entman, 1993). According to him, "[t]*o frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation*" (Entman, 1993). This means actors use language in a well calculated and strategic way in order to swing and shape the issue at hand in line with interests actors hold (Snow & Benford, 1992).

Research of role of frames was utilized in various types of actors, who communicate their positions. Apart from the media domain (Entman, 2007; Scheufele & Tewksbury, 2007), framing was utilized also in research of policy formation and policy actors (see van Hulst & Yanow, 2016) and in research of social movements (Snow & Benford, 1988). The last domain is of high relevance for our research. For example, Usher (Usher, 2013) investigated how local groups in United Kingdom frame their own opposition to coal mining, showing a competing frames over the impact of coal extraction on the local community. Lis and Stankewicz (Lis & Stankiewicz, 2017) showed how dominant players successfully framed opposition to shale gas mining as incompetent, which warranted exclusion of the opposition from the policy process.

Frames in social movements provide simplifications which allow construction of meaning – "people come to embrace a particular version of reality" (Futrell, 2003) through frames. The activity is pertinent to groups as such, within which "collective framing processes" lead to frame construction (Futrell, 2003). From the social movement perspective, frames act as "sets of beliefs… that inspire and legitimate the activities and campaigns" (Benford & Snow, 2000) and thus act as means of mobilization of groups, which embrace particular framing of the situation. Snow and Benford (Snow & Benford, 1988) argue that frames fulfill diagnostic, prognostic, and motivational functions.

The "diagnostic" function is manifested as the definition of the problem. Causal agents who created the problem are identified, as well as blame and responsibility for the problem is attributed. The "prognostic" function is manifested when members of social movements propose solutions to the identified problem. Strategies, tactics and targets are specified and suggested, distinguishing which actions are legitimate and desired and which actions should be avoided. The "motivational" function of the frame is manifested through justifications of necessity of an action, providing impetus for participation (Benford & Snow, 2000; Snow & Benford, 1988).

Local opposition and social networks

Although the relevance of social networks is well-recognized in literatures on collective action and, especially, on social movements (Diani & McAdam, 2003), there is not much of such research in the analysis of local opposition. The role and effects of social networks are here considered rather as perspective research avenues (Devine-Wright, 2005; Toke et al., 2008). Nevertheless, the mere acknowledgement of social networks relevance is, of course, not sufficient, the social movements literature, as well as other research fields, thus soon started to

ask not whether networks matter, but how they matter (Diani, 2003b; Passy & Giugni, 2001). Ocelík et al. (Ocelík et al., 2021) identify at least four general understandings of the social networks importance for local opposition dynamics. More specifically, social networks (1) as *micro-mobilization* structures, (2) sources of *social capital and trust*, (3) conduits for *information and ideas diffusion*, and structures mediating (4) *access to resources*.

First, social network structures have been found instrumental for the *supply-side of participation* since they provide information exchange infrastructure trough which actors can learn about the actions and intentions of the others (Klandermans, 2007). In this context, social networks are expected to decrease transaction and organizational costs, dissuade freeriding through increased levels of peer pressure and social control, and thus reduce individual participation costs in collective action (Mitchell & Carson, 1986). Kitts (Kitts, 2000) as well as Ocelík et al. (Ocelík et al., 2021) show that network self-organization effects, such as activity, have been stronger predictors of participation in local opposition than sociodemographic and socio-psychological drivers, such as environmental concern or place attachment, measured at the individual level. Networks can also substitute or parallelize formal institutions of political participation, such as local governance structures, if there is a lack of trust to such structures or elites that control them (Shemtov, 2003). Likewise, pre-existing social networks can facilitate mobilization against the planning and siting processes negatively impacting local communities. Anderson (C. Anderson, 2013) documents how a network of local opposition was formed in response to a land-use that was threatening rural community.

Second, it has been shown that *social capital* is drawn from resources embedded in structure of social networks (Burt, 1992; Granovetter, 1973; Nan Lin, 2017). In line with this reasoning, Devine-Wright (Devine-Wright, 2005) assumes that local social networks, such as kinship and friendship relationships, might substantially affect public acceptance of the siting processes. Further, it was

documented that interpersonal network structures could facilitate trust-building not only among local communities, but also between the communities and locally-based siting staff (Venables et al., 2009). Networks, nevertheless, can be treated also at the outcome variables that are impacted by external events. Unwanted land-use processes thus might disrupt or recompose local networks and, in results, negatively affect levels of social capital and trust within the local communities (Devine-Wright, 2009; Nadaï, 2007).

Third, social networks function as conduits that *enable or constrain flows of information and ideas* (Valente, 1996). Such diffusion processes are expected to substantially affect actors' attitudinal and perception characteristics. Cash (Cash, 2001), for instance, shows that networks facilitate common problem perceptions which consequently enhances decision-making. Toke at al. (Toke et al., 2008) thus consider social networks as "an important institutional variable" that influences the planning and siting processes. Their study of wind power plant sittings shown that negative attitudes alone are not sufficient to hamper the siting process since it is more important how these attitudes are distributed within networks at the decision-making level (Toke et al., 2008). In addition, local networks have been found to facilitate diffusion of media contents which in turn influence affects and affective evaluations of the planning and sitting (Stern, 2008).

Fourth, social networks provide *access to various resources*. Besides a general social capital, this can include access to decision-making, organizational memberships, as well as to spatially or otherwise distant social groups. Mitchell and Carson (Mitchell & Carson, 1986) shown how events related to planning and sitting processes, such as public hearings, mediated access to decision-making actors. As shown by Granovetter (Granovetter, 1973), social networks tend to span across local social circles through the so called *weak ties* which facilitate transfer of non-redundant information and resources. In similar fashion, networks that emerged in local communities often reach outside their boundaries and

provide access also to organizations that operate at different spatial and juridical scales (Bebbington et al., 2008; Keck & Sikkink, 1998). It is contented that such *brokerage opportunities* have a potential to contribute to nurturing leaders and shaping discourses, nevertheless, presence of actors with diverging goals might cause fragmentation of the network.

Social networks as micro-mobilization structures: A case study

This section summarizes findings of the second case study as presented in Ocelík et al. (Ocelík et al., 2021). It focuses on *inter-personal long-term cooperation network* of (local) opposition to rescission of the coal mining limits. As discussed before, social networks are considered as important conduits that enable and/or constrain participation in collective action (Diani & McAdam, 2003; Tindall, 2008). We follow this reasoning and focus on the role of social networks as *micro-mobilization structures* (Kitts, 1999) with an emphasis on individual *differential participation* (Passy & Giugni, 2001). In other words, we are interested why some opposition members participate more than others.

Research design

There were two main research objectives:

(1) to explore the opposition network and

(2) to examine mechanisms that contribute to differential participation in the opposition.

More specifically, we investigated influence of particular network mechanisms on *differential participation*, an outcome variable of the study, which is understood as *an intensity of involvement in collective action through specific activities* (Passy & Giugni, 2001). Due to modeling requirements, the differential participation variable was binarized into the *low-participation* and *high-*

participation values. Besides, we controlled for standard sociodemographic, such as age or socioeconomic status, and sociopsychological, such as environmental concern of place attachment, individual attributes (Devine-Wright, 2007).

As for the network mechanisms, we focused on *attribute-based activity* measured at the individual level simply as a node degree. Node degree can be considered as a potential for communication activity that is hypothesized, through increased information flow and interaction opportunities, to have a positive effect on differential participation (Kitts, 1999; Tindall, 2008). Considering the above, we tested following hypothesis:

H1: *The probability of high-level participation is higher for actors with more long-term cooperation ties to others (activity mechanism)*

Social contagion (Teo & Loosemore, 2011) was the second examined network mechanism, which builds on the assumption that actors are being influenced, both intentionally and unintentionally, through their embeddedness within the network structure (Knoke & Yang, 2008). This in turn can also affect their individual attributes, such as differential participation. Our focus was on *simple contagion* that assumes a single source of influence (Centola & Macy, 2007). An adjacent actor in the connected dyad defined by the outcome attribute (a high-level participation) is considered as evidence or this process (Daraganova & Robins, 2012). In this context, the long-term cooperation is considered a strong tie (Granovetter, 1973) or social bond which assumes increased commitment and peer-pressure (Baldassarri & Diani, 2007). It is thus expected that the effect of contagion on differential participation is positive. Considering the above, we tested the following hypothesis:

H2: *The probability of high-level participation is higher if adjacent long-term cooperation network partners have high-level participation* (contagion mechanism)

We controlled for individual-level attributes hypothesized to influence differential participation. More specifically, age, education, gender, and household income as standard *socioeconomic variables* (Gillham, 2008; Context Matters: Explaining How and Why Mobilizing Context Influences Motivational Dynamics, 2009). Besides, we included three sociopsychological variables. *Environmental concern*, a variable measured by *new ecological paradigm* scale that differentiates between the ecocentric and anthropocentric attitudes (Dunlap et al., 2000). *Perceived efficacy*, a variable that captures perception of having an impact through participation activities (Klandermans, 1984). *Place attachment*, a variable that represents a positive emotional connection to the location (Devine-Wright, 2009). And finally, *spatial proximity* of respondents to the mining areas which was included as a measure of the proximity-based NIMBY syndrome (van der Horst, 2007).

We used structured face-to-face interviews based on the survey questionnaire that included also an open-ended section to obtain qualitative inputs from respondents. The data collection was done between April 2017 and February 2018. We used a snowball sampling technique which is adequate for hard-to-reach or hidden populations (Goodman, 1961). Each respondent nominated 0 to 7 persons with whom the respondent engages in long-term cooperation. The resulting network consists of 39 respondents who have been classified into three categories based on their organizational affiliations: (1) “locals” (n = 21) – opposition members who live in the locality, (2) “professionals” (n = 12) – opposition members whose participation cannot be separated from their occupational tasks, and (3) “grassroots” (n = 6) – non-resident opposition members who participated in nation-wide climate campaigns.

We applied autologistic actor attribute models (ALAAMs) to data (Daraganova & Robins, 2012). The ALAAMs allows to predict an outcome individual-level attribute (a high-level participation) while accounting both for network interdependencies, represented by specific network mechanisms, as well as for standard individual-level variables (Bryant et al., 2017). Moreover, it is argued that ALAAMs are especially useful for snowball sampled data which, by definition, include observation dependencies (Kashima et al., 2013). Based on the theoretical expectations, we specified three models including different sets of control variables, specifically: (1) *structural*, (2) *socio-psychological*, and (3) *sociodemographic* models, to predict the *high-level participation att*ribute. All three models included *attribute density* term which describes occurrence of the outcome attribute (high-level participation) and provides a baseline for interpretation of other effects (Kashima et al., 2013) as well as both network mechanisms represented by the *attribute-based activity* (H1) and *attribute-based contagion* (H2) terms. The *structural* model includes only the network terms. The *socio-psychological* model includes the network terms as well as socio-psychological variables (environmental concern, place attachment, and perceived efficacy) and the NIMBY variable (spatial proximity). The *sociodemographic* model includes the network terms, sociodemographic variables (age, education, gender, and household income), and the NIMBY variable.

Findings

To meet the first research objective, we explored structural properties of the *long-term cooperation network* as described in Table 22. It has density 0.16 at a node count of 39, 120 present edges, and average degree of 6.15. There are no isolates, only a connected dyad separated from the rest of the network. The values of Louvain modularity (0.37) and average clustering coefficient (0.66) indicate a pronounced segmentation of the network. The degree centralization of the network is relatively high (0.52) reflecting presence of two outliers identified as

nodes with degree (> 15.5) which is 1.5times higher than the degree centrality upper quartile value; one of the outliers has a high-level participation status. The betweenness centralization is comparatively lower (0.37) with three outlier nodes whose normalized betweenness is higher than 0.073; two out of the three outliers have high-level participation status.

If we compare average degree and average betweenness of all 20 high-level participation opposition members to the overall network average, the differences are following. The average degree for high-level participation opposition members is slightly higher (7.1 compared to 6.15) whereas their average normalized betweenness is about 25% higher (0.037 compared to 0.029). It can be argued that the high-level participants are important for the overall network connectivity and facilitate *bridging* between cohesive segments of the network and, at the same time, function as *leaders* in their well-connected social circles (Diani, 2003a). The heterogeneous composition of the high-level participation opposition members supports this finding. The group consist of 11 local community members, 3 grassroots activists, and 6 professionals working for various environmental non-governmental organizations. Considering qualitative insights from interviews and field work, we expect that the organizational heterogeneity reflects intentional division of labor and differentiated protest repertoire. Overall, the long-term cooperation network resembles a *polycentric structure* characterized by multiple and sometimes competing centers of influence (Gerlach, 1999).

To meet the second research objective, we fitted three autologistic actor attribute models to the *long-term cooperation network*. Remarkably, there were no significant effects of the individual control variables with the exception of the *perceived efficacy* in the sociopsychological model which take on high values for 18 out of 20 high-level participants. We argue that this might be related to a general distrust to political elites and institution that are not able

Table 22 - Long-term Cooperation Network Structural Properties

Network property	Long-term cooperation
Node count	39
Edge count	120
Mean degree	6.15
Degree standard deviation	4.72
Density	0.16
Connectedness	0.90
Degree centralization	0.52
Betweenness centralization	0.37
Average clustering coefficient	0.66
Louvain modularity	0.37

and/or willing to resolve the conflict (Ocelík et al., 2017), protest tactics thus can be seen as a more efficient way how to make a difference than the "standard political participation". Importantly, the proximity-based NIMBY variable was insignificant in all model specifications. The individual-level variables, in general, exhibited low variance since most opposition members were highly educated middle-aged men with ecocentric environmental attitudes, strong place attachment, and high perceived participation efficacy (Frantál, 2016). These findings document that individual attributes are *not* sufficient to explain differences in the individual participation within the local opposition. For a more detailed summary of the models see Ocelík et al. (Ocelík et al., 2021).

The results for network terms have been consistent across all three models. The *attribute-based activity* was the only other (besides the perceived efficacy) significant effect. Its strength slightly increased in the sociodemographic model indicating a positive interaction effect. *Attribute-based contagion* effect was, to the contrary, insignificant in all three models. This shows that high-level participation opposition members have not been influenced through long-term cooperation ties to other high-level participants. These findings indicate that social networks function as *micro-mobilization structures* through increasing the incentives and opportunities to participate rather than through peer-pressure and norm diffusion processes (Kitts, 1999; Passy & Giugni, 2001; Tindall, 2008). We concluded that these results provide a robust support to the *activity hypothesis* (H1) and do not support the *contagion hypothesis* (H2).

We argue that the results have two general *policy implications*. First, relevance of *underlying network structure* of local opposition for individual participation makes a case that any future communications and negotiations should consider the opposition' informal organization. Besides, identification of central actors who "hold network together" can be used for facilitation of policy learning (Heikkila & Gerlak, 2013; Howlett et al., 2017) and compromise-seeking. Second, *organizational, ideological, as well as spatial heterogeneity of the opposition* (Černoch et al., 2019) calls for a more inclusive and participation-oriented approaches to planning and siting processes that would reflect relational embeddedness of the opposition, as this case study shown, as well as its discursive contexts (Černoch et al., 2019).

SECTION 5

CONCLUSION

The analysis presented here deals with the opposition movement against the expansion of coal mining in the Czech Republic. It focuses mainly on the relational and individual factors behind the high-level participation on the movement, and on the sociopolitical context in which the opposition movement is embedded. Throughout the research, we examined the nature of the connections among the opposition members and their individual socioeconomic characteristics, opinions, and attitudes. We interpreted the resulting findings through the lenses of the existing policies and public debates defining the coal question in the Czech Republic.

Our findings show that the opposition network is a complex structure, consisting of a relatively homogenous group of people. The individual attributes of the opposition members suggest that it is highly educated middle-aged men (Context Matters: Explaining How and Why Mobilizing Context Influences Motivational Dynamics, 2009) who hold ecocentric views about the environment, who are deeply attached to the affected locations emotionally, and who are strongly convinced that their engagement in the opposition has led or will lead to policy change (Passy, 2001).

With regard to other individual attributes, with the exception of *perceived efficacy*, we did not find any significant impact of sociodemographic or sociopsychological variables on high-level participation on the opposition. Moreover, the participants showed a similar level of attachment to the affected localities regardless of their domicile, suggesting that the residency variable is of

fairly limited importance in explaining their participation (Badera & Kocoń, 2014, 2015). The network structure, on the other hand, is far from being homogenous. In fact, it includes multiple centers of influence. These centers may be of a temporary nature, and their approach and actions vis-à-vis the issue in question may be convergent or divergent. The network dynamics appear to be driven far more by actor activity than by the mechanism of contagion. In other words, the results suggest that high-level participation is not triggered by the directly connected members of the movement. Instead, the sheer amount of active connections with other opposition members appears to be the most important predictor of high-level participation. This is in line with the existing research, which suggests that multiple network connections increase the incentives and opportunities to participate (Tindall, 2008) as well as strengthen cohesion inside the movement (Kitts, 1999; Passy & Giugni, 2001).

Future policies should particularly account for (1) the interdependency of individual participation in the opposition and (2) its heterogeneous composition. With regard to the former, the opposition network can be characterized by interdependent collective action driven primarily by actor activity, i.e. the degree to which the actor is connected with the others. Future communications and negotiations should therefore take into account the informal organization of the opposition network. Such communication should be directed primarily to opposition members who facilitate collective learning (see Heikkila and Gerlak, 2013; Howlett, Mukherjee and Koppenjan, 2017). More specifically, these include the "coordinators" of the network, i.e. the people who bridge the otherwise separated or weakly connected clusters of the opposition, and the network's "gatekeepers" and "representatives," i.e. those who link it with stakeholders outside the opposition. This also inevitably compromises the efficiency of campaigns targeted to the "average joe" or the median citizen.

With regard to the heterogeneity of the opposition, it is important to acknowledge the complex geographical, organizational, and ideological structure of the

network. The geographical composition of the opposition is rather diverse. Both "typical members" and high-level participants consist of a comparable amount of residents and non-residents (Della Porta & Piazza, 2008; Della Porta & Rucht, 2002). In terms of the organizational structure, the opposition consists of municipal representatives, local civic associations, and professional NGOs, as well as a radical grassroots movement. This translates into divergent approaches towards the preferred course of action – ranging from petitions to direct action – as well as to ideological plurality. The distinctive streams of opposition differ in their ideological positions, especially in their perspectives on democracy (be it direct or representative), ecological modernization, and systemic change. These differences give rise to three distinctive frames within the opposition.

The first frame focuses on the local impact of coal. It emphasizes aesthetical value of the local environment and the way of life of the local communities. In line with the concept of place attachment (Devine-Wright, 2007), this frame prioritizes the local context over the national one. National policy concerns, such as the competitiveness of coal-dependent industries or energy self-sufficiency, do not outweigh the local interest in preserving the local environment and local settlements. This reasoning is further developed through its connection with a specific perspective on national governance. In this perspective, a distrust of state institutions dominates. These institutions are deemed to be aloof from local communities and uninterested in improving their living conditions. In the conflict between the coal industry and the coalmining opposition, opposition members in this frame believe that the institutions side with the industry, which renders them unfit to draft sound policies and, in a wider sense, play the role of a trustworthy partner for the local community and the opposition (Botetzagias & Karamichas, 2009; Della Porta & Piazza, 2007; Özen, 2009). In the social environment defined by this "crisis of representation," extra-institutional forms of political participation, such as building an opposition movement (Della Porta & Rucht, 2002; Usher, 2013), are seen as legitimate and efficient means to counter the envisaged expansion of coal mining.

The second frame builds on Environmental Modernism (Hajer, 1995; Van Der Heijden, 1999). It puts the climate change problem to the fore and is much less concerned with local conditions. This frame positions the opposition movement as an important building block in the struggle between the status-quo actors (with vested interests in the continuation and further expansion of coal mining) and a progressive coalition (campaigning for a gradual phase-out of coal). In this perspective, local opposition movements complement efforts at the national and international level focused on increasing the legitimacy of the anti-fossil coalition and influencing the public debate and policy process (Della Porta & Tarrow, 2005). The Czech context, both according to our results and the interviewed opposition representatives, is unique for the very little emphasis the climate problem receives in the public discussion. While the negative effects of coal mining and use on the local environment are widely acknowledged, the climate change issue is neglected, even by the citizens of the coal regions. Here, it is the environmental NGOs active nationwide who have introduced the issue into the opposition's agenda. With regards to legitimate means of introducing the desired change, this frame views direct action as a last resort option, as it may prove disruptive for the cohesion of the coalition, and thus counterproductive.

The third discursive stream is very much climate-centered. Unlike the second stream, it does not see a gradual coal phase-out happening within the context of the contemporary socioeconomic system as an efficient means of tackling the problem. Instead, it envisages a more radical solution. The climate crisis is closely associated with global capitalism, and can only be mitigated by changing the system (Dryzek, 2005; Usher, 2013). The conflict over the future of coal mining is seen as yet another battleground between the status-quo "capitalist" forces and their challengers. Similarly, the entanglement of the marginalized local communities and (trans)national radical climate and environmental movements is understood as a basis for igniting changes beyond the scope of energy policy. Naturally, direct action and civil disobedience emerge as the main tools for bringing about these changes (Adams & Shriver, 2016; Novák, 2013).

These differences clearly stem from the actors' deeper ideological orientations (Černoch et al., 2019; Litmanen, 1996; Ocelík et al., 2017). Notions of economic utility or a cost-benefit approach towards the issue are, on the other hand, barely present in the overall discourse of the opposition. The primacy of ideological motivation and its diversity enables the opposition movement to mobilize different concerned social groups and increases the capacity of collective action, while rendering it largely nonresponsive to the material aspects of various policies, such as the (re)distribution of costs and benefits.

In terms of the wider political context in which the opposition operates, we identified three factors which shaped the country's coal policy in the affected area, and four factors which are likely to determine its future. With regards to the historical factors, the first is the ambiguity with which the dominant political parties have approached the issue. The parties which have mainly governed the country since 1991 have not managed to end the debate of mining coal beyond the established Limits once for all. They have either remained undecided (The Civic Democratic Party, ODS) or internally split on the issue (Czech Social Democratic Party, ČSSD), or have changed their positions over time (Action of Dissatisfied Citizens, ANO; Christian Democratic Party, KDU-ČSL). Strong opinions on the issue have only been held by parties with marginal influence on the country's politics: the Communists (KSČM), who have been in favor of maximum utilization of the domestic coal reserves, and the Greens (SZ) who have campaigned for writing off the reserves beyond the Limits permanently.

Second, there have been major disagreements and conflicts inside the coal industry itself, which have compromised the pressure the industry has exerted on decision-making institutions. These conflicts mostly concerned the price of coal collected by the mining companies from electricity and heat producers, and frequent changes in ownership of the mines and associated facilities.

Third, the country's coal policies have not been aligned with each other. Most notably, the recent strategic documents issued by various state agencies pursue mutually exclusive goals. The legally binding State Energy Policy Update of 2015 (Ministry of Industry and Trade, 2015) calls only for a slow decrease in the use of coal, while another document by the same ministry, the Raw Minerals Policy, generally leaves the question of coal open (Ministry of Industry and Trade, 2017). In contrast, the documents prepared by the Ministry of the Environment – the "Policy of Climate Protection" and the "Policy of Air Protection" (Ministry of Environment, 2016, 2017) – call for much stricter measures, leading to a faster decline in the use of coal. Similarly, the country's policies fail to navigate between climate, energy, and social policy in a coherent and predictable way (Ocelík et al., 2019). This results in unintended lock-ins which prolong the time period for which coal will be required. Examples of such lock-ins include the subsidized refurbishment of household boilers (coal-firing units were also eligible for the funding) and the procurement of a new coal-fired power plant, Ledvice, by the partially state-owned ČEZ, which led to partial expansion of mining at the Bílina mine.

We have also identified four factors in particular that will influence the future of coal mining and use in the country. First, the troubled expansion of nuclear power could bring the country back towards greater use of fossil fuels, including coal, if it eventually fails and no new nuclear units are installed. Second, the capability of the heating industry to switch from coal to an alternative source of energy will be crucial. The price of heat in the country's district heating system is a very sensitive issue from a socioeconomic and political standpoint. So far, in many regions the relatively low price of heat was only possible due to low prices of lignite, making it an important component of the country's social welfare policy. Third, mining operations at the largest mine – the Czechoslovak Army Mine, are approaching the Territorial Limits. If mining is to continue beyond them, the decision to do so would need to be undertaken soon, before current operations end – and with them, the revenues needed to prepare the new areas for mining. Fourth, the strength of the opposition movement and public opinion on the issue

certainly will affect the results of the political process, especially considered the ambivalence with which the main political forces in the country approach the issue.

Apart from past and current policies, the political context in which the opposition movement operates is affected by the public discourse. In our research, we focused mostly on the media discourse, which we approached as a proxy for public discourse in general (McQuail, 2010). We studied the Czech media discourse using a theoretical lens of second-order agenda setting (M. McCombs, 2005) and therefore focused on the attributes (such as categories or issues) that constitute "coal mining" in the media, as well as on the salience of these attributes in the media discourse. We conducted two separate inquiries into the media discourse: the first utilized quantitative, computer-assisted content analysis of all newspaper articles about coal mining published between 1996 and 2016, while the other offered qualitative insights into articles about the future of coal published six months before and six months after the Paris Conference (December 2015). The second inquiry also opened up a comparative perspective, presenting the same analysis for the other two important coal countries in Central Europe: Germany and Poland.

Our results show that the Czech media discourse around coal is fairly narrow. It is mainly concerned with the topic of mining itself, with particular attention to the issue of the Territorial Limits. After 2011, the issue of the declining price of hard coal and the subsequent economic problems of the country's sole producer of the commodity – the OKD Company, also received some attention. Interestingly, other important issues typically associated with coal were barely reflected or missing altogether. One of them was the energy security perspective. Despite the strong emphasis on the security of supply in the country's official energy policy (Osička & Černoch, 2017) and a general preference for utilizing domestic sources of energy with the aim of minimizing the dependence on energy imports (Ministry of Industry and Trade, 2004a, 2015), this aspect barely made

it into the news. The results of the qualitative analysis showed a few traces of security narratives, especially patterns of meaning associated with the role of coal-fired power plants in the stable operation of the national grid, and the lack of functionally comparable alternatives to these plants, but overall, the presence of these security narratives is rather scarce.

The biggest surprise came from the generally low salience of environmental topics and the near absence of the climate issue in the discourse. Throughout the past two decades, only the issue of environmental reclamation of the areas where mining took place gained some attention. Only in recent years has the issue of the impact of coal mining on the local environment gained traction and become the chief concern related to coal mining in a typical line of argumentation in the analyzed media. The climate issue, however, is missing entirely from the discourse. The results indicate that the media fail to acknowledge the inevitable link between coal production and its use and treat coal mining as if it was a separate industrial activity with separate environmental effects. Especially in the case of brown coal, where there is very little international trade with this commodity and what is produced is typically consumed locally (Starý et al., 2017), such an approach appears rather surprising. It is, nevertheless, a shared conclusion from both of our media analyses that the production of greenhouse gases and the climate issue is simply not reflected in the discourse. It is noteworthy that out of 362 investigated articles about the future of coal published around the conclusion of the Paris Agreement, only six of them somehow reflected the results of the conference; only two of them made the conference itself the primary focus. These findings widely echo the general observation by Healy and Barry, who have pointed out that while the issue of greenhouse gas emissions is discussed intensively in (international) climate negotiations, approaches seeking to specifically limit and end fossil fuel extraction are largely marginalized (Healy & Barry, 2017).

By presenting the coal question as a dilemma between inflicting damage to either the local environment or to the local economy and the well-being of the local community, the media has shown a notable concern for the economic condition of the coalmining companies. Especially around the time of the demise of OKD and during the government negotiations about the future of the mining Limits, the media associated the socioeconomic development of the coal regions with the prosperity of the mining companies. Along these lines, it is important to acknowledge that the high salience of the companies' prosperity makes it seem like a crucial issue for the discourse. In such a discursive environment, the economic problems of the companies will be generally perceived more cautiously by the public and policymakers. This will incentivize the latter to undertake extraordinary measures to tackle this salient problem. Such measures may include direct or indirect subsidies or allowing the continuation of mining.

Interpreted through the lens of the agenda-setting theory, we can conclude that the Czech media co-create and cultivate a discursive environment in which the question of coal mining and coal use is reduced to a dilemma between the local environment and local employment. With public discourse conditioned in such a way, it is hardly surprising that climate protection policies would be more difficult to implement (the salience of the climate issue is chronically low) and, on the other hand, policies aimed at keeping the coalmining companies alive and well would be more likely to gain traction among policymakers and would be more easily accepted by the public.

Such policies will, however, intensify the response of the opposition movement. The clash between pro-coal industries and the opposition, mediated by the undecided establishment and uninterested press can be expected to heat up once the excavators approach the established Limits and as national discussion about the future of coal intensifies. In such a context, future policy planning could benefit from putting more emphasis on defusing the situation. Specifically, a shift from technocratic, elite-based policy formulation towards a more participatory

and engaging approach (Durdovic, 2016) could be a more efficient solution in negotiating compromises between the opposition and non-opposition stakeholders. Our results also suggest that the future interaction between the opposition and decision-makers could benefit from a more credible acknowledgement of the living conditions near the mines, the close connection between coal mining (and use) and climate change, and the potential of technological alternatives to cheap coal in electricity generation and heat production.

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