

JUGGLING RISK: LAY PERCEPTIONS OF ECOLOGICAL AND HEALTH RISK  
IN POST-SOVIET MONO-INDUSTRIAL TEMIRTAU

ҚАТЕРМЕН ОЙНАУ: ПОСТКЕҢЕСТІК МОНОИНДУСТРИЯЛЫ ТЕМІРТАУДАҒЫ  
ЭКОЛОГИЯЛЫҚ ҚАУІП-ҚАТЕР МЕН ДЕНСАУЛЫҚ ЗАРДАБЫ ТУРАЛЫ КҮНДЕЛІКТІ ТҮСІНІК

ЖОНГЛИРУЯ РИСКОМ: БЫТОВОЕ ВОСПРИЯТИЕ ЭКОЛОГИЧЕСКОГО РИСКА  
И РИСКА ДЛЯ ЗДОРОВЬЯ В ПОСТСОВЕТСКОМ МОНОИНДУСТРИАЛЬНОМ ТЕМИРТАУ

by

XENIYA PRILUTSKAYA

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Juggling risk

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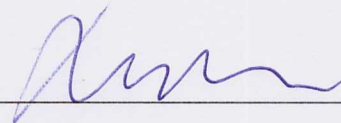
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BY  
Xeniya Prilutskaya  
NU Student Number: 201417590

**APPROVED**

BY  
Dr. John Schoeberlein

ON  
The 22nd day of June, 2016.



Signature of Principal Thesis Adviser

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by

XENIYA PRILUTSKAYA

Principal adviser: Dr. John Schoeberlein  
Second reader: Dr. Beatrice Penati  
External reviewer: Dr. Cynthia Werner

Electronic Version Approved: ✓

Prof. Alexander Morrison  
Director of the MA Program in Eurasian Studies  
School of Humanities and Social Sciences  
Nazarbayev University  
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## Table of contents

Abstract .....	v
Acknowledgment .....	vii
Introduction .....	1
Historical background .....	3
Theoretical framework .....	5
<i>Risk and danger</i> .....	6
<i>Environmental risk as addressed in the scholarly literature</i> .....	9
<i>Structure of the thesis</i> .....	12
Chapter 1 Methodology and sample .....	15
Sample .....	19
Historical content analysis of the local newspaper .....	22
Chapter 2 Trust .....	25
Trust in the Soviet Union .....	25
Historical analysis of trust in the case of Temirtau .....	29
<i>The era of protection (the early 1980s)</i> .....	30
<i>Glasnost: doubt and rethinking (the late 1980s- the early 1990s)</i> .....	35
<i>Crisis of trust?</i> .....	40
Chapter 3 Lay knowledge as opposition to expert knowledge .....	42
Lay notion of health .....	44
Lay notion of ecological risk .....	48
Who is an expert? .....	50
Chapter 4 Sources of lay knowledge .....	58
School and textbooks .....	59
Periodicals .....	61
Gossip .....	62
Internet resources .....	63
Newspapers .....	65
Chapter 5 Perceptions of environmental risk .....	68
Coping strategies of Temirtau residents .....	70
Conclusion .....	75
Bibliography .....	78

## Abstract

Temirtau is a mono-industrial post-Soviet city in Central Kazakhstan. Its large steel mill has caused serious environmental pollution for several decades already. This thesis focuses on how residents of Temirtau think about and deal with environmental and health risk. It considers how environmental discourse began to develop during the Soviet era and how it changed across the post-Soviet years, emphasizing the influence of political and cultural factors.

Based on the analysis of the media discourses on environmental problems and industrial risks in Temirtau starting from the 1980s until the late 1990s, I argue that although Temirtau has not experienced natural or anthropogenic disaster such as those witnessed in Chernobyl or Fukushima, nevertheless Temirtau residents experienced a breakdown in public trust over the period from the late 1980s to the early 1990s. This breach of trust was connected with Perestroika and Glasnost. However, this breakdown in Temirtau manifested itself not only in the rise of environmental activism, but also in a process by which there was rethinking of ecological knowledge and expertise. Residents gradually came to understand that the knowledge on environmental risk and measures to reduce it that residents possessed so far was inadequate.

I argue as well that after the period of breakdown in trust laypeople had to find a way of coping with the remaining problems while having less than ever hope and trust that the city can handle environmental problems. Some people left Temirtau, though it was not only because of the ecology, but also due to economic decline. Residents who stayed had to develop strategies how to live with the new perceptions of ecological risk in a situation where ecological problems became evident and could not be concealed and explained as

potentially easy solvable any more. As I found out in my interviews, Temirtau residents adopt different coping strategies. These strategies have some relation to social and educational background, age and occupation of the respondents.

I also discuss the question about the opposition of lay and expert knowledge on ecological risk and on ecological expertise in Temirtau. I answer the question, in the case of Temirtau, who residents think is an expert in defining and evaluating ecological health risk and what is the source of lay knowledge on ecological problems. The discrepancy in defining the role of experts, as well as a lack of lay participation in decision making processes, make the gap between lay and expert knowledge wider and political mistrust among citizens even deeper. Today residents of Temirtau continue to see ecological experts ambivalently and continue to be excluded from the decision making process regarding the environmental problems of the city. The strategies that residents of Temirtau use to cope with environmental risks are often based on the psychological effort to shield themselves from a situation of perceived helplessness and to cope with their feelings of anxiety about a worsening environmental and economic situation.

This MA thesis is based on data gathered in qualitative interviews with factory workers, inhabitants of workers' neighbourhoods in Temirtau and ecology specialists. I tried to diversify the range of opinions by taking a variegated sample, including respondents from different social, ethnic, educational and age groups. I also tried to combine anthropological methods of interviewing with the historical method of content analysis of newspaper articles.

### **Acknowledgment**

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## Juggling Risk: Lay Perceptions of Ecological and Health Risk in Post-Soviet

### Mono-industrial Temirtau

#### Introduction

In late 2013 I worked as a fieldwork assistant for an anthropologist who was carrying out his research at the steel mill in Temirtau, a Soviet-built metallurgical town in Kazakhstan.<sup>1</sup> One day one of the female factory workers was complaining about her health problems after a long work shift underground. She worked as a conveyor belt operator in the underground section of the steel mill's crushing and sorting plant (*drobil'no-sortirovochnaia fabrika*) where iron ore is being transferred from one production section to the other. She linked her poor health condition to the environment at the factory and exclaimed with passion that if somebody would switch off the light when workers come out from the underground section, then everybody would see how workers' bodies shine due to the radiation that workers absorb from the ore. At the time, I was surprised to hear that some factory workers have such a perception of the health risk entailed in their industrial jobs. However, this kind of evaluation of the risk drew my attention because it was rather the exception than the rule. Later on, when I was doing my own research in the Temirtau City Library, I found an article published by a local newspaper about an experiment made by a correspondent to evaluate participation of Temirtau residents in the Earth hour initiated by the World Wide Fund for

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<sup>1</sup> Dr. Tommaso Trevisani conducted his anthropological field work in Temirtau in 2013 - 2014 in the framework of a project at the Max Planck Institute for Social Anthropology. During my assistance work as a research assistant (October 2013 - May 2014) I found my inspiration for my MA thesis topic and established important contacts for my MA research. I would like to thank Dr. Trevisani for this.

Nature in 2007, when everybody should turn off the electricity in order to draw attention to environmental problems and to climate change in particular.<sup>2</sup> The author of the article wrote with surprise that residents of Temirtau were practically ignoring this event although the town evidently suffered from ecological problems and citizens should be more concerned about drawing attention to and solving of the environmental problems, whilst Astana, Almaty and many other cities in Kazakhstan, as well as other cities from all over the world participated more actively.<sup>3</sup> I was wondering what could be the reason for Temirtau residents to think and to perceive the ecological situation so differently (varying from a complete ignorance to a desperate anxiety): is it their social position, origin or experience of work at the industrial plants that cause the environmental problems?

Temirtau differs from other cities of Central Kazakhstan because of its unique history linked to the construction of the steel mill and because of its social and ethnic composition. Today the population of Temirtau is about 185,500 inhabitants.<sup>4</sup> Although many of them left Kazakhstan in the post-independence period, Russians in Temirtau constitute the absolute majority (55% of Temirtau population are Russians, 31% are Kazakhs).<sup>5</sup> The city has 928 enterprises and five of them are large plants and factories causing very heavy environmental pollution.<sup>6</sup> Many residents are either directly employed by the steel mill or they work in the steel mill as contract workers. Temirtau also differs from the other places such as Chernobyl and Semei (also known by its former Russian name, Semipalatinsk), where either sudden or

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<sup>2</sup> Earth Hour. Accessed March 26, 2016. <https://www.earthhour.org/>.

<sup>3</sup> See: Svetlova, Alexandra. 2011. "Nam "Zemli chas" - ne ukaz!" *Temirtauskii rabochii* (Temirtau), March 30

<sup>4</sup> Komitet po statistike. Accessed May 23, 2016.

[http://stat.gov.kz/faces/wcnav\\_externalId/homeNumbersPopulation?\\_afLoop=35889190986507483#%40%3F\\_afLoop%3D35889190986507483%26\\_adf.ctrl-state%3DdimtylrI0I\\_71](http://stat.gov.kz/faces/wcnav_externalId/homeNumbersPopulation?_afLoop=35889190986507483#%40%3F_afLoop%3D35889190986507483%26_adf.ctrl-state%3DdimtylrI0I_71).

<sup>5</sup> Ibid.

<sup>6</sup> Shcherbakova, K. 2012. "Spasite prirodu!" *Temirtauskii rabochii* (Temirtau), October 3.

prolonged environmental disasters occurred and where people have to struggle with the consequences.

In my research I decided to try to find answers to the following questions: What do residents of Temirtau think about industrial ecological risk? How do they perceive, evaluate and cope with the ecological problems, threats and consequences and what does it tell us about the Temirtau community and Kazakhstani society in general? Do the Temirtau steel mill workers react to ecological risk differently or similarly in comparison to those residents who work in town? Are there other reasons for differences in the perception of ecological risk and hazard? Or, in other words: how successful and how different are the Temirtau residents in *juggling ecological risk*?

In this introductory section I will first present the historical background of Temirtau, its community and its social composition. Then I will lay out the theoretical debates around the key terms of risk and danger adopted in this thesis and explain which definitions I use. Subsequently, I will relate to the works of other scholars, who work in research settings similar to Temirtau. In the last part of introduction I will present my argument and explain the structure of the following chapters.

### **Historical background**

The history of the construction of Temirtau is similar to the history of Magnitogorsk, which is described by Kotkin in his book, *Magnetic Mountain* (1995). However, the Temirtau steel mill, although planned during the late Stalin period, was built after the death of Stalin, in the late 1950s, therefore 30 years later than the one in Magnitogorsk. Unlike Magnitogorsk, Temirtau was built on the foundation of a pre-existing industrial infrastructure (with the

access to water, coal and iron ore) and engineers' experience of building big metallurgical combines.

The community that lived in Temirtau was similar to the "quicksand society" of Magnitogorsk, where many people were constantly moving in and out because of the severe climate and bad living conditions (Kotkin 1995, 73). In 1958, the Temirtau steel mill was declared a "Komsomol shock construction site" and was meant to expand proletarian urban culture into the Kazakh steppe. Unlike Magnitogorsk, where people were recruited from collective farms, in Temirtau young people were attracted to the construction site through calling out a *komsomol'skaia putëvka* (Popov and Zverev 1958, 12), an all-Union level call to young people to join the work on construction sites all over the Soviet Union. Moscow decided to send 26,000 construction workers to Temirtau from all over the USSR (Popov and Zverev 1958, 14). Additionally, a great number of future Temirtau residents came to join the construction work voluntarily (Popov and Zverev 1958, 22).

The Karaganda Province is known for being at the centre of a galaxy of Gulag camps with many prisoners. Many Karlag (one of the Gulag camps situated in Karaganda Province) prisoners worked on the construction of the steel mill. Moreover, there was a large number of foreigners in Temirtau, especially Bulgarians (1,070 people). They came to Temirtau as specialized workers, but some of them were unskilled and were trained only after arriving to Temirtau (Shaimukhanov 1966, 133). The overall population of Temirtau increased from 25,000 people in 1945<sup>7</sup> to 113,900 in 1961, and reached 250,000 in 1988.<sup>8</sup>

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<sup>7</sup> See: Bondar, A. 2009. "Kak Temirtau shagal v step'." *Vecherniaia gazeta* (Temirtau) February 25.

<sup>8</sup> Data provided to Dr. Tommaso Trevisani from the City Statistical Committee (*Gorodskoi statisticheskii komitet*), Temirtau, in July 2014. I thank Dr. Trevisani for these data kindly provided to me.

Once construction of the plant was completed, it “covered some 5,000 hectares in the town of Temirtau just 20 km north of Karaganda” (Peck 2004, 112) and became the second largest integrated metallurgical plant in the Soviet Union. “It had four blast furnaces with a total capacity of 5.1 million tons of pig iron” (Peck 2004, 112). The decline in production in the early 1990s was a source of concern and the government attempted to attract foreign investment. In October 1995 the steel mill was bought by Ispat International, a division of the UK-based LMN Group, which was in turn controlled by the British-Indian billionaire Lakshmi Mittal (Peck 2004, 112). The World Bank reported that the foreign investor secured numerous privileges in the negotiations with the Kazakhstani state — e.g., an eight-year period to “complete a program of improvements”. It also obtained a provision that during the first ten years any new environmental law would not “be applied or be enforced against the purchasers” (2001, 81).

Being the second largest in Soviet Union (Peck 2004, 112), from the very beginning the steel mill caused great air pollution and industrial contamination of water and soil. The Nura River near Temirtau is polluted with mercury, and the stocks of hazardous waste stored near the enterprise increase from year to year (Peck 2004, 118). Different sources name Temirtau as one of the most contaminated areas in Kazakhstan, ranking it variously at the second, third or fourth place among cities in Kazakhstan.<sup>9</sup>

### **Theoretical framework**

The key terms that I use throughout my research are *ecological* or *environmental risk* and *danger*, as well as *industrial risks*.<sup>10</sup> In order to distinguish them clearly and to define the

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<sup>9</sup> See: Sitnikov, I. 2013. “Temirtau - chetvërtyi v spiske samykh griaznykh gorodov Kazakhstana.” *Novyi Temirtau*, January 25; EKaraganda.kz. 2012. “Temirtau priznali vtorym po zagriaznënnosti vozdukha gorodom v Kazakhstane” February 11. Accessed April 7, 2016. [http://ekaraganda.kz/?mod=news\\_read&id=3257](http://ekaraganda.kz/?mod=news_read&id=3257).

<sup>10</sup> I treat the words *environmental* and *ecological* as synonyms.

characteristics of these concepts I explore how these terms are used in the scholarly literature and what their features and characteristics are. Then I will describe other cases in which environmental risks and their perceptions have been studied in comparable research settings.

### ***Risk and danger***

Carl Pritchard gives the traditional understanding of risk as “a situation where an event may happen and the frequency of occurrence can be evaluated based on a probability distribution of past occurrences or environmental consideration” (2015, 7). This definition relates to every risk — ecological, financial, technological, etc. Pritchard compares *risk* to *uncertainty* and defines risk as having certain level of event probability, whilst uncertainty refers to a situation where probability is unknown. Probabilistic agency in risk was also discussed by Merkelsen (2011), who made a discourse analysis of debates over risk definition and semantic comparison between the terms of risk and danger. These debates show that risk is difficult to define and that the distinction between risk and danger is not always evident. Merkelsen argues though that risk and danger are not synonyms, because there is an element of probabilistic agency in the concept of risk, which is absent in that of danger (2011, 883). Ecological risk and ecological danger have very close meanings. I will now explain how I use terms of risk and danger, and then explain them in relation to ecology and present their characteristics.

In the rest of this thesis, I use the term *danger* to describe a situation when some actions or events are threatening and can be damaging. The *risk of danger* is the possibility that a danger can emerge and this possibility can be measured by specialists, mainly based on previous experience. In a situation when specialists with a specific knowledge background,

first, measure the risk of a danger and, secondly, define or state this risk in some way (for instance, by making forecasts as to whether a place is potentially dangerous for human health), they decide what is dangerous and give precise numbers. People then can decide whether to take a risk or not. The crucial point here is *decision*.

Different risks can be *positive* or *negative*. Risk (if it is not ecological) is not necessarily connected to danger. For instance, financial risks or technology risks can be positive. This seems to work, for instance, when somebody buys a lottery card. There is even a proverb in Russian: risk is a noble matter (*risk – blagorodnoe delo*). The origin of this proverb is in playing cards, where taking risk means the chance to win or to lose money. There was a lottery popular during the Soviet Union called “five of 36” or “six of 45”.<sup>11</sup> Everybody knew the time on television when the game was taking place. At the beginning of the performance the TV show presenter always had to say the number of people who participate and the amount that it was possible to win in the given week. This fact was meant to give a sense to participants how great the possibility of a win (or the risk of a loss) was. The logic or culture of watching numbers was essentially the same for evaluating all sorts of risks. Risk and knowledge are connected therefore through numbers (in the case of lottery through the numbers of participants and amount money). When one knows the numbers, it means one can evaluate the risk and decide to take the risk or not. Since many Temirtau factory workers and city dwellers have experience rooted in Soviet times and came to Temirtau during Soviet era, I assume that many of Temirtau residents inherited this attitude to risk in general. At the same time, whilst some people came to Temirtau in the 1960s by their own choice and some were sent but later decided to stay by their own choice,

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<sup>11</sup> The point of the game was to choose five numbers out of thirty six (or six out of forty five) and to send this in advance to a lottery committee and then a machine would select some numbers and if you match then you win.

the risk should be perceived differently by their descendants. For many of the latter, to live in Temirtau was not really matter of choice and decision.

In case of environmental or ecological risk, the picture is more pessimistic. *The Landscape and Urban Planning Dictionary* defines ecological risk as “evaluated threat of intense reduction in productivity and efficiency of natural system or parts thereof, because of modified or harmful environmental conditions” (Evert 2001, 526). The Russian sources define ecological risk as an evaluation of possibility of negative changes in the environment, or a possibility of the long-term negative consequences of these changes, which have arisen due to negative anthropogenic influence/effects on environment.<sup>12</sup> This is the possibility only of something negative: dangerous situations, dangerous health consequences, and negative effect on nature. Probably this is the reason why ecological risk and ecological danger are used as synonyms in popular discourse.<sup>13</sup> Ecological risk is still related to numbers and knowledge, just as risk in playing cards, because the danger is evidently bigger and the situation is more complicated.

Industrial ecological risk is one of the central issues in understanding contemporary society. Risk can even change the structure and logic of class society. Ulrich Beck argues that the contemporary world is not based anymore on the redistribution of resources and wealth, but on distribution of risks (1992). According to him, in contemporary society class matters relate to the question of who makes decisions concerning the distribution of industrial risks. People of the lower social classes are under economic pressure and more exposed to danger, damage and health consequences. Poor people are exposed to risks due to their

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<sup>12</sup> See Vasilenko, V.A. 1997. *Ékologija i ékonomika: problemy i poiski putei ustoichivogo razvitiia*. Novosibirsk: GPNTB SO RAN, 84; Ekologia. Accessed March 26, 2016. <http://ru-ecology.info/term/13750/>.

<sup>13</sup> This can be seen when I will present the lay notion of ecological risk in Temirtau later in Chapter 3.



poverty. Wealthy people, on the one hand, can afford to drink pure water, buy better and more expensive food, live further from industrial settings and decide where to locate factories and plants. On the other hand, after all, the polluted air and contaminated food and water penetrate everywhere. The pesticides, mercury and other pollutants accumulate in fish, meat, eggs, milk and fruits, and become universally present. "Poverty is hierarchic, smog is democratic" (Beck 1992, 36). This is Beck's pessimistic account of risk and the future of society. Hence, industrial ecological risk is a measurable possibility of bad consequences of human industrial activity for the environment and for people; this risk depends on decisions of certain humans, but the consequences are universal for humankind.

Since a key aspect of risk involves decision making, it is also about the future. Hazard and danger exist in the present, whilst the risk as the possibility of emergence of a danger pertains to the future. The forecasts about risk or about possible future danger influence people's decision about future life. When a person lives in Temirtau being exposed to a risky environment, swims in a pond there, eats food and lets children play in the playgrounds with sand that might be polluted, it is also about one's future and the future of one's children. Although all people are exposed to industrial risks, these risks are unevenly distributed across class. For people of the lower social position, their future and the future of their children are more exposed to danger. To sum up, ecological risk has negative connotation and is related to knowledge through numbers, evaluations or forecasts. Ecological risk is closely connected to decision making process and to the future.

### ***Environmental risk as addressed in the scholarly literature***

The literature dealing with environmental and health risk studies is devoted primarily to environmental catastrophes and ecological disasters such as Chernobyl and other similar

nuclear sites. The problem of danger caused by nuclear plants exists in many countries and attracts the attention of many scholars, including anthropologists. Chernobyl in Ukraine (Petryna 2002), Semipalatinsk, a nuclear testing site in Kazakhstan (Werner and Purvis-Roberts 2013; Stawkowski 2016; Purvis-Roberts, Werner and Frank 2007), La Hague in France (Zonabend 1989), Richland in USA and Ozersk in Russia (Brown 2013) have been the objects of anthropological research. One of the main questions that draws anthropologists' attention is the way of speaking about these zones, notably because many of these nuclear sites are hidden (or at least not well-known) and not discussed. While Chernobyl or Fukushima are "household words", which means that they are well-known and talked about (Brown 2013, 3), other places like La Hague or Ozersk are not debated and therefore often not perceived as dangerous. The same can be said about Temirtau. It is well-known that the factory releases enormous amounts of dangerous pollutants and heavily impacts the population's health, but discourse constructed around Temirtau promotes the idea that the situation is not unusual and that there is nothing to be widely discussed.

Discourse analysis (with a particular emphasis on the way discourse is constructed and what exact words are used) is one of the main research methods of Françoise Zonabend (1989). By conducting linguistic analysis, she claims that specific language and vocabulary (or the way of speaking "nuclear") psychologically unify people who live in contaminated areas and oppose them to others, who sometimes tend to regard citizens of such areas as *untouchables* because of their being exposed to radiation.

The use of a specific vocabulary and a certain way of speaking is also characteristic of people who live in such areas as Chernobyl, once they have learnt how to use it for their benefit.

Adriana Petryna argues that "science had social utility" for the residents of Chernobyl

(2002,31), as they use their status to show their “ties” to Chernobyl as currency for getting compensation or some other benefit like, for example, advanced medical services.

Using victim status for economic purposes became possible in the time of instability and arbitrariness which was characteristic of the Ukraine, Russia, and Kazakhstan during the period of transition after 1991 (Burawoy and Verdery 1999). In the case of the Ukraine, where the state was eager to counterpose itself to its predecessor, the USSR, the practice of providing compensation went out of control. Ukrainian authorities could not support all the victims of Chernobyl with appropriate financial help and the situation turned into one more field for corruption (Petryna 2002). In Kazakhstan, President Nazarbayev also used the political discourse of closing the Semipalatinsk *poligon* (testing site) and positioned himself as someone different from his Soviet predecessors. “Nazarbayev’s reference to morality suggests that the new state is a ‘moral’ actor in comparison to the previous state that acted immorally in regards to the victims of nuclear testing” (Werner and Purvis-Roberts 2013, 301). Economic instability and uncertainty were characteristic of independent Kazakhstan, too, but the citizens of Semipalatinsk could not use this situation as Chernobyl residents did, because the Kazakhstani state did not provide the population of contaminated regions with compensations on a large scale. Therefore, they elaborated their own strategy in either positioning themselves as “radioactive mutants”, who got used to radiation, or by considering this nuclear discourse as absurd (Stawkowski 2016). Hence, scholars discovered that residents who populate areas under significant industrial ecological risks often cope with those risks by using linguistic tools: either to protect themselves psychologically or to gain economic benefits. I assume that the kinds of strategies developed by residents of nuclear cities towards environmental and health risk are applicable in relation to Temirtau. During Soviet times many workers at the Temirtau steel mill enjoyed good compensation

and numerous privileges (for instance, early retirement) for carrying out heavy jobs. Today most of the privileges are eliminated and steel workers have to find their own ways to preserve their health.

Researchers often discuss the location of nuclear sites and underscore that these sites are located in regions with weak or undeveloped economic infrastructure. The population of these areas is forced to accept nuclear danger, fearing the alternatives of unemployment and deprivation. This is characteristic not only of post-Soviet countries, but globally. Rob Nixon suggests using the expressions “environmentalism of the poor” and “slow violence” to express the idea that political and economic elites expose poor people to ecological danger, because the latter have no resources and cannot protest or resist, even if they wanted to (2011). In relation to Temirtau, the population was not forced to accept environmental danger at the time when steel mill and city were constructed. As I mentioned earlier, many residents came from all over the Soviet Union and stayed by their own choice. However, today many residents cannot leave the city and must accept the ecological risk out of fear of unemployment and deprivation elsewhere, which could also be a type of the “slow violence” described by Nixon.

### ***Structure of the thesis***

In order to discuss the strategies that residents of Temirtau use to cope with environmental risk and problems, I begin by looking at the historical background of this question. I started with the idea that Temirtau residents felt the need to develop coping strategies as a result of some events or at least of some changes. What I want to address here is the discourse on environmental problems. Based on the analysis of the media discourses on environmental problems and industrial risks in Temirtau starting from the 1980s until the late 1990s, which

I will present in Chapter 2, I argue that although Temirtau has not experienced natural or anthropogenic disaster such as those witnessed in Chernobyl or Fukushima, nevertheless Temirtau residents experienced a breakdown in public trust over the period from the late 1980s to the early 1990s. This breach of trust was connected with Perestroika and Glasnost. However, this breakdown in Temirtau manifested itself not only in the rise of environmental activism, but also in a process by which there was rethinking of knowledge and expertise. When built, the Temirtau steel mill had a model character. Its modern equipment and the state-of-the-art technology employed attracted people from all over the Soviet Union. As one of my respondents claimed, Temirtau was an example to follow in everything, including ecology, and therefore many people, engineers and intellectuals came to Temirtau. Later, in the early 1990, during Glasnost, coinciding with the period when the city reached its peak population, the ecological discourse started to change. Residents gradually came to understand that the knowledge on environmental risk and measures to reduce it that residents possessed so far was inadequate.

As Geoffrey Hosking argues, trust is based on knowledge (2014). He argues that, depending on what kind of knowledge (“extensive” or “slight”) trust is based upon, trust can be considered “thin” or “thick”. Even if based on thin (e.g., limited) knowledge (this is the case when ordinary people cannot grasp all the specific features of a given problem), people still can deeply trust institutions and the state. Hosking calls such type of trust a “strong thin trust” (2014, 47). Employing Hosking’s terms to an analysis of the environmental discourse in Temirtau’s newspapers from the late Soviet period I think that the trust in Soviet Temirtau could be defined as strong thin trust. The population believed in the state and trusted that it would do a good job of caring about a safe environment for its citizens, although this trust was based on a very limited knowledge. However, as I will show in my analysis later, during

the *rethinking* era, which coincided with/was caused by Perestroika, Glasnost and independence (1980s - 1990s), the residents came slowly to understand that the expertise that was available earlier on ecology was not sufficient and that the solutions of the environmental problems caused by the factory are not so comprehensive and effective. Hence, trust in state expertise and state care declined and, again in Hosking's terms, turned into "weak thin" trust, in other words into weak trust based on little knowledge. I argue therefore that, in this sense, Temirtau experienced a kind of disaster within the period of breakdown in trust in the late 1980s-early 1990s (I explain and develop this idea in Chapter 2), after which laypeople had to find a way of coping with the remaining problems while having less than ever hope and trust that the city can handle environmental problems. Some people left Temirtau, though it was not only because of the ecology, but also due to economic decline. Residents who stayed had to develop strategies how to live with the new perceptions of ecological risk in a situation where ecological problems became evident and could not be concealed and explained as potentially easy solvable any more. As I found out in my interviews, Temirtau residents adopt different coping strategies. These strategies have some relation to social and educational background, age and occupation of the respondents. In Chapter 5, I show how these strategies are constructed based on and related to specific backgrounds.

In the first chapter I describe the methodology of my research and my interview sample. The second chapter presents a short historical analysis of the newspaper articles in order to understand the underpinnings of public trust in Temirtau today. The third chapter deals with lay knowledge and the way it is opposed to expert knowledge, while the fourth chapter describes the sources that lay knowledge relies on. In the fifth and last chapter I describe the lay evaluations of environmental risk in Temirtau, and the strategies that Temirtau

residents use in order to cope with ecological industrial risk. I also offer an explanation of the diversity of these strategies.

## **Chapter 1**

### **Methodology and sample**

For this thesis I have interviewed people who live in Temirtau and work at the steel mill Arcelor Mittal Temirtau (the present name of the steel company) and I have compared their responses with those of who live in Temirtau but do not work at the steel mill. After preliminary reflections on the possible cleavages among potential respondents I chose to look at the fault line between those who work in town and those who work at the steel mill. Other possible cleavages could have been the one between *old* and *young*, or between *company* and *contract workers* (Trevisani 2014), or between people who have been affected by environmental hazard (and are now physically ill) and those who have not. I have chosen to look at the dichotomy between people who work in town and people who work at the steel mill after having preliminarily defined the interview questions. I assumed that people who work at the factory might have a particular level of lay expertise that makes them different from those who do not work in the factory and this might be interesting for analyzing the differences in perceptions. Some questions implied a historical perspective: it was, therefore, difficult but interesting to interview young people, because they are often not interested in history and have different ideas about the past. Nevertheless, I did not organize my interviews around the age difference of my respondents. Rather, I chose to focus primarily on their employment background.

The dichotomy between *affected* and *not affected* people would be difficult to explore, because the health impact caused by industrial contamination is very hard to trace and takes time: health consequences are not immediate and acute, and are not always defined as related to industrial causes. This question is also related to the way the health care system is organized, and to the definition of work-related illnesses: in particular, the procedure for the definition of cancer as work-related illness is developing now, while earlier on only respiratory illnesses and some other diseases were defined as related to metallurgy. Therefore, it seemed interesting to explore how perceptions of people affected by health problems caused by industrial pollution differ from those of people who were not affected, but this question was too difficult to analyze. Moreover, conversations with people affected by industrial contamination (with serious diagnoses such as cancer) proved to be very difficult to undertake due to moral considerations.

Tommaso Trevisani, who worked in Temirtau with a project on changing forms of industrial labor in Temirtau, has focused on the distinction between company and contract workers (2015). He also posited a dichotomy between *zavodchane* (factory-people) and *gorozhane* (townspeople), which rests on a distinction between people who earn their living at the steel mill and those with other jobs in the city administration, commerce and services (Trevisani 2014, 14). The professionals who work at the steel mill are likely to possess better knowledge regarding contamination and work conditions at the steel mill. Kathleen Purvis-Roberts, Cynthia Werner and Irene Frank conducted a similar investigation of risk perceptions in post-nuclear Semipalatinsk (2007). These authors compared the viewpoints of scientists, physicians and lay persons in Semipalatinsk and discovered that the evaluation of health conditions made by physicians do not coincide with the evaluation made by scientists, but tend to be sometimes even closer to lay perceptions.



Initially I planned to conduct interviews with clear differentiation between *zavodchane*, *gorozhane* and experts — i.e., with five respondents who work at the steel mill, five respondents who work in town and two experts, one from *EkoMuzei* in Karaganda and one from an organization which was involved into the project of Nura River water purification. I used the non-probability sampling because I was collecting cultural data without making claims that can be generalized through probabilistic representativity to a wider population but rather making a close study. I am originally from Karaganda and during my work as a research assistant I spent six months at the plant and got acquainted with many workers on one of the shop-floors of the steel mill (crushing and sorting plant). I used this social network to find specialized informants who were willing to talk and who could give cultural information about perceptions of environmental risk. Another source of informants was my own network of acquaintances from the times when I studied at the university and through other friends. Some informants were my friends or acquaintance of different kinds, but at least half of the informants were those with whom I was not acquainted previously. The decision to restrict myself to twelve informants was made based on the principle articulated by Bernard, that “10-20 knowledgeable people are enough to uncover and understand the core categories in any well-defined cultural domain or study of lived experience” (2011, 154). I conducted twelve semi-structured interviews and wrote down answers. Eliciting oral histories helped the respondents to feel freer than they would answer a set of pre-determined questions. In order to define the topics to discuss and not to stick to strict interview questions I worked in a library and read newspapers. The libraries of Temirtau and Karaganda hold collections of newspapers starting from 1971. I tried to find events reported in newspaper articles, which could provoke some discussion on health risk. Ultimately, I

found some articles, as for instance an article on a foreign laboratory checking the sand in children playgrounds in Temirtau and discussed it with my informants.

During the process of interviewing and analyzing the results I came to an understanding that it is difficult to make a clear distinction between people who work at the plant and those who do not. First of all, the ArcelorMittal steel mill is the major employer and many of the city organizations are either auxiliary companies or contractors, which means that the people who work in these contractors also have close ties to the factory. Second, many among the *gorozhane* (those who work in town as opposed to those who work in the factory), worked in the plant in the past or are related to someone who works in the plant, meaning that they also possess a great deal of knowledge about the plant. For instance, a teacher from my sample teaches ecology in an *ÉkoShkola* (EcoSchool) supported by and associated with the plant. Another woman from my sample teaches technology at a professional secondary school where students are prepared for work in the steel mill.

Thus, rather than two neatly defined, opposite social groups, my sample represents a range of different voices from the Temirtau community. I conducted interviews with people of different ages and life paths, men and women, old and young. Some of them came to Temirtau as adolescents during the booming years of construction and worked at the factory for their whole life, while others were born in Temirtau and remember the chimneys their entire life. Some of them are members of one family but belong to different generations. Some of them left Temirtau some years ago but continue to be connected either by work or by relatives. My respondents have different social and educational backgrounds, although I did not conduct interviews with people from the lowest social layer (in the case of Temirtau the lowest social position practically means *unemployed for a long time and/or homeless*).

None of my respondents was affected by a severe illness, like cancer, imputable to industrial contamination.

### **Sample**

I describe now more closely my sample in order to explain what social, ethnic and age categories they represent.

Respondent 1 (Nazira) is an elderly Kazakh woman, now retired, who has worked at the factory, but in the headquarters (*zavodoupravlenie*), doing office work.<sup>14</sup> She came from Karaganda a long time ago, is well educated and had a higher social position (taking in account her experience, living- and working place). She represents the *old working intelligentsia* or the factory workers with a higher social status.

Respondent 2 (Ermek) is a young Kazakh man, around 28 years old. He is the son of Nazira, which means he was raised in a family with higher social position. He has a good education and worked at the factory (as contract worker) and in the municipality. He represents descendants of the “old working class” (Trevisani 2014) and of the young generation with higher social status.

Respondent 3 (Madina) is a Kazakh woman of 35 years of age. She is the daughter of Nazira, has an excellent foreign education and is a descendant of the old working intelligentsia. She left Temirtau for a better life more than ten years ago, but is still connected to the town through family. Madina has herself also acquired some experience of work at the factory.

Respondent 4 (Nikolai) is an aged Russian male factory worker, who is now about to reach his retirement. He came from Russia by his own choice, following his family members. He

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<sup>14</sup> All the names are pseudonyms. The pseudonyms follow ethnicity, as I have given Russian, Kazakh or other names accordingly.

has worked at the plant for a long time already, has secondary education and is also a representative of the old working class, although his social position is lower than Nazira's, since his job is of lower status.

Respondent 5 (Venera) is an elderly Tatar female worker, who is about 55 years old. She came from Russia as a young adult, following her family members. She has a secondary vocational education and she has worked at the factory for many years. Venera represents the old working class of a middle social position.

Respondent 6 (Marina) is a Russian woman, aged 40. She is originally from Temirtau and works at the factory as a contract worker for a short time only. She has secondary school education (maybe incomplete) and a low social status. Her grandmother came from Moldova for reasons unknown to the respondent. I assume she was either sent to Karlag (because the descendants of Karlag prisoners very often did not know the reasons for family to come to Kazakhstan) or possibly came for construction works. Marina represents the lower social segment of the new working class with poor education and low income.

Respondent 7 (Aigul) is a Kazakh woman, aged 33, who has worked for some years in the town and then for some years at the factory as a contract worker. She is not very well educated and originates from a village outside of Karaganda. She represents the new working class with lower social status. One year ago she left Temirtau for a better life, as well. However, she is still in contact with some former co-workers.

Respondent 8 (Lena) is a young Russian woman, around 35 years old, has a degree in nursing at a secondary professional school, raises five children and hence does not have formal employment. She was born in Temirtau and has lived there her entire life. Her parents came to Temirtau as construction workers (in the 1960s). She has not worked at the factory

and she has the weakest ties to the factory of all my respondents. She represents the city dwellers (*gorozhane*) with a professional secondary education, as well as descendants of the people who came to Temirtau during construction work by their own choice.

Respondent 9 (Svetlana) is an elderly Russian female teacher at technical secondary school, aged around 55. She works in town, although teaches future factory workers. She was born in a village near Temirtau. She is well educated and represents the old Temirtau school intelligentsia.

Respondent 10 (Mikhail) is an expert, aged 37. This expert was participating in a program on water purification of the Nura River (which is polluted with mercury). The clean-up program was initiated by a foreign company. This expert was not professionally trained as an ecology expert but is a practitioner, who acquired a certain degree of knowledge by translation and participation.

Respondent 11 (Irina) is an expert and a teacher of ecology in the school in Temirtau, aged around 45. She was born in Temirtau and claimed that she represents the opinion of the community rather than of the experts. Still, her education, occupation and experience show that she represents the ecologists of the town rather than lay population. I better explain the role of educated ecologists in society in Chapter 3.

Respondent 12 (Alexander) is also an expert, aged around 50, who has no connection to Temirtau apart from occupation. He works as the Head of the *EkoMuzei* (EcoMuseum), which is situated in Karaganda.

### **Historical content analysis of the local newspaper**

In addition to conducting interviews, I also analyzed newspaper articles in a local newspaper appearing between 1980 and 2014. The materials from a part of this period, from 1980 until 1993, were crucial for understanding the underpinnings of contemporary perceptions of the ecological problems and knowledge.

Media can shape public perceptions and impact lay attitudes towards certain events by choosing what to show and how to present information (Udell and Mehta 2008; Boholm 2009), especially when the lay population has limited personal experience (Vickovic et al. 2014). In risk studies, scholars discuss the question that risk perceptions, decision making processes and policies are also influenced by the way media represent them (Boholm 2009). Media representation does not necessarily coincide with the way things are represented by scientists. As a result some risks are exaggerated, others are underestimated, and the general picture can be simplified and become disconnected from science (Boholm 2009). Nevertheless, newspapers, national and local, can be used as historical sources to study representations of risk. Local newspapers, as compared with national ones, give an important view on what people in a particular region were reading and, to some extent, thinking, at a particular time. They can also give not only the dominant narratives of elites, but also local knowledge as well as the attitude of local press towards metropolitan ideas (Brockett 2009).

One method for analysis of media sources is content analysis. Content analysis can be quantitative and qualitative (Altheide 1987; Krippendorff 2004; Udell and Mehta 2008). Quantitative content analysis is numeric and is based on the frequency of occurrence of words, themes, titles, data and types of articles (Udell and Mehta 2008, 537). Qualitative

content analysis is also called ethnographic content analysis and is essentially a reflexive analysis of documents (Plummer 1983; Altheide 1987; Udell and Mehta 2008). It is based on “constant discovery and constant comparison of relevant situations, settings, styles, images, meanings and nuances” (Altheide 1987, 68). Using qualitative content analysis is appropriate if a researcher needs to discover emergent patterns within and between articles by focusing on the narratives (Altheide 1996; Vickovic et al. 2014). At the end of an ethnographic content analysis, one has a collection of “categorical and unique data” from every article, where categorical data are derived from narrative patterns that emerge during comparing and analyzing (Vickovic et al. 2014, 460). The researcher defines a set of variables at the beginning of the analysis, which serves as a guide, but different variables can also emerge later during the study (Altheide 1987). Thus, a researcher has to be “systematic and analytic” (Udell and Mehta 2008, 537).

In my thesis I have employed both methods: qualitative and quantitative content analysis. I collected a set of articles from *Temirtauskii rabochii* (353 articles), a local newspaper published in Temirtau. It started to appear in 1947 and is published today as well, although the publication stopped for ten years between 1999 and 2010. The other newspapers that I decided not to use were national ones, published by the factory, or very recent ones.

*Kazakhstanskaia pravda*, for instance, publishes news related to the whole republic and does not give insights and perspectives on issues related specifically to Temirtau. The newspaper (or factory bulletin) *Metallurg Temirtau*, later *Metallurg*, is published by the steel mill and presents limited information, mainly related to the steel mill and not to the city. Its agenda is presumably to show the factory in a positive light, hence it would not display the existing problems of industrial contamination and ecological risks in all their gravity and complexity.

The more recent newspaper, *Vecherniaia gazeta* (published from 1998) is an important source for understanding current ideas on environmental risk, but it cannot help to understand the difference between the discourse of late 1980s and 1990s and the current one. The publisher of *Temirtauskii rabochii* has also changed, but the editors claim to “continue the traditions of their predecessors (*prodolzhit’ traditsiiu predshestvennikov*)”.<sup>15</sup> Since I am interested in both the continuity with the Perestroika period and changes throughout the later periods, it makes *Temirtauskii rabochii* a better source, for comparative purposes, than other newspapers.

I have looked through all available issues of *Temirtauskii rabochii* in the regional library starting from 1980. Each issue of the newspaper consisted of four pages until 1997 (in the 2000s, the newspaper grew to as many as 32 pages). Some general information from Moscow appeared on the first page (such as news about the appointment of a Party Secretary), but the majority of the articles were dedicated to local news and problems. The articles related to the environment concerned nature and industrial contamination. In tagging the articles in *Temirtauskii rabochii*, it is often hard to decide whether an article was, exclusively about trees and plants as such (for example, on how to grow them) or also about their impact on the environmental situation of the city (for example, due to the absorption of pollutants), so initially I have considered all articles that have a link to the macro-themes of either *nature* or *industrial contamination*. I created a table containing the content of articles with the name, author, publication date, page number, short description of the text and tagging. The table contains 353 descriptions for a period of 22 years.<sup>16</sup> In the library

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<sup>15</sup> Cabmarket.kz. Accessed March 26, 2016.

<http://cabmarket.kz/catalog/company/node/regionalnaya-gazeta-temirtauskii-rabochii>.

<sup>16</sup> However, only 17 years (1980-1986, 1988-1993, and 2011-2014) were represented more or less well, whilst the subscriptions for the other years were very incomplete.



collection, every year had a varying number of missing newspaper numbers. However, as by and large the newspaper series were complete, it is possible to make general statements about average numbers, topics and trends. I also created graphs based on the tagging and then analyzed some particular excerpts from particular articles that represent evident trends.

## **Chapter 2**

### **Trust**

In order to better understand the underpinnings of contemporary ideas and perceptions of the lay population it is necessary to carry out a historical analysis of the discourse. Ecological knowledge and perceptions of ecological risk are closely connected to political trust, both when trust is present and absent: knowledge contributes to trustful or distrustful attitudes, and the absence or presence of trust shapes people's responses and behavioral strategies.

In order to understand how public trust and distrust function and affect lay perceptions of risk today, I will look at how ecological risk and ecological problems were presented and discussed earlier on, during the 1980s-1990s, when there were no internet and knowledge about the environment depended even more on the way it was presented in television, radio and newspapers.

### **Trust in the Soviet Union**

Scholars distinguish between two major types of trust: social or interpersonal trust, and political or institutional trust. Social trust can be divided into personalized trust, which means trusting people one knows personally, and generalized trust, which is trust in other individuals who are not particularly familiar (Tan and Tambyah 2011). Political (or public)

trust refers to the judgments made by individuals about the trustworthiness of political institutions, such as governments or local authorities, and to the opinions of individuals about how institutions meet people's expectations (Kong 2012). Russel Hardin argues that if we claim that we trust the state, we mean that the government is competent enough "to handle the hardest of our contemporary issues: education, race, terrorism, poverty, crime, drugs, immigration" (2008, 12). In this sense, our trust is considered as the positive expectation of the state's reliability. Thus, some scholars insist on using of the term "confidence in government" rather than "institutional trust" (Hardin 2008; Putnam 1995; Sztompka 1999). Hosking, for instance, argues that confidence is trust based on the very good knowledge and/or long experience (2014, 27).

Scholars use various definitions of trust. Hardin claims that trust is a belief that someone, whom we trust, is trustworthy, has the right intentions towards us, and is competent to do what we entrust this person to do (2008, 17). Reinhard Bachmann defines interaction-based trust and institutional-based trust as "phenomena that manifest themselves in an active decision by one party to rely on another party under conditions of risk" (2011, 207). Trust is regarded as the basis of civil society, which is the intermediary between state and citizens. On the one hand, trust must not be excessive, because citizens' apathy and non-participation can diminish people's control over the government; on the other hand, insufficient trust causes civil society to disintegrate, because if people do not trust the state the latter cannot act in a properly democratic way (Mishler and Rose 1997, 419). Scholars explore possible explanations of decline of political trust in democratic, as well as in authoritarian societies, connecting the decline of political trust with the erosion of social trust and social capital (Pharr et al. 2000; Kong 2012; Zhong 2014).

Hosking's book about the history of trust undertakes an extensive and deep analysis of different approaches (sociological, historical and anthropological) to studying trust (2014). He discovered many definitions of trust and conditions necessary for the development of a culture of trust. In more general terms Hosking assigns to trust the leading role in determining how society functions and gives trust the same importance as power. He defines trust/distrust as "the part of the deep grammar of any society" and as a factor, which "determines our social behaviour" (2014, 22). He also argues for a strong connection between perceptions (identities, discourses), decisions, actions and the future. In order to take decisions, people "need [to] trust in other people or institutions, or simply in the future" (2014, 5). Hosking also argues that trust is based on knowledge and presents a system of different types of trust. He argues that depending on the amount (*thickness*) of possessed knowledge and on the strength or weakness of trust in a society there can be four types of trust: "strong thick trust", "strong thin trust", "weak thick trust" and "weak thin trust" (2014, 47). Moreover, Hosking argues that Western societies today experience, not a crisis of trust, but a shift towards "strong thin trust", or towards a strong form of trust in state institutions based on "thin" knowledge.

This part of my research focuses on ideas of trust in the state across the late Soviet time and the Perestroika era, and then during the transition period after 1991 in post-Soviet Kazakhstan. A number of scholars have studied societal changes, the increase and decrease of trust in post-Communist countries, and the possible historical reasons for these changes (Ljubownikow et al. 2013; Bernhard 1996; Mishler and Rose 1997). Some scholars argue that one of the characteristics of the Soviet time before Perestroika was a lack of institutional trust (Ljubownikow et al. 2013; Bernhard 1996). Michael Bernhard explains such a form of distrust as a legacy of the Stalin period, when the Soviet state's political

course was “directed at destroying all forms of political and social organization that posed any potential alternative to its monocratic rule” (Bernhard 1996, 314). The post-totalitarian states had more space for links within society, but still, social pluralism was only emerging during periods of crisis or weakness. Seventy years of Communist rule heavily affected political organization, and intermediate organizations (between state and society) were rarely successful in breaking free from state power (Bernhard 1996, 315). The only type of institutions that enjoyed trust were informal and unofficial networks (Mishler and Rose 1997; Ledeneva 1998). These networks were not only kinship-based but also based on friendship and acquaintance. Kennedy, Kawachi and Brainerd (1998) similarly argue that citizens who lived under totalitarian regimes are “likely to minimize contact with the state and to rely upon dense horizontal networks of trusted friends” (1998, 2031). This is why some scholars (e.g., Bernhard 1996, 315) talk about a duality in Soviet and post-Soviet society. Russia, for example, is called “an hour-glass society”, meaning that the Soviet society was divided in two halves: the ruling elites and ordinary people (Rose 1995; Kennedy et al 1998; Ljubownikow et al. 2013). There were networks of cooperation within each (top and bottom) half, but there was limited cooperation between them.

I agree that Soviet society was divided in these two parts, but I think that characterizing the Soviet society as marked by institutional distrust is not appropriate: if we apply Hardin’s definition of political trust as the competence to handle education, poverty, crime and medicine (2008, 12), it is clear that the Soviet citizens had precisely the confidence that their state could handle these things. Nobody doubted that the Soviet state could provide free education, stable employment, and protection against crimes (McMann 2007).

Regarding the period of Perestroika, Ljubownikow et al. argue that although the Gorbachev era initiated the process of liberalization and emergence of organizations that were alternative to the state and more independent, these organizations lacked political and legal authorization (2013, 157). Hence, they remained informal and undeveloped; the “hour-glass society” persisted, while in practice there was little interaction between political elites and common people.

### **Historical analysis of trust in the case of Temirtau**

In his book on the last Soviet generation and the end of the Soviet rule Yurchak (*lurchak*) argues that in order to analyze past discourses a researcher should study two types of documents (lurchak 2014, 42-43). On the one hand, it is important to analyze what people were thinking at the time under analysis, by looking at what they were reading and writing in their diaries. On the other hand, it is also important to study what people thought years later, when they were able to access other sources and reassess the events of their past. Yurchak built his argument based on discourse analysis of newspapers, diaries, memoirs and interviews. Unfortunately, I cannot analyze what residents of Temirtau were thinking in the late 1980s, because I have not had access to diaries from that time. However, I can focus on and analyze what they were reading: hence my interest in their local newspaper.

Newspapers publishers during the Soviet Union were under the state control until 1991 and published the information that they were allowed to show. Therefore, the information given by media was the official information, which was meant to form the public opinion and shape public knowledge on different issues. However, local newspapers could have some more autonomy. Publishers on the spot could position themselves as *translators* of the

information they got from Moscow or as agents charged with the critical reassessment of that information, although this could not be done in a radical way.

I will now present the analysis of the articles selected from subscription of the Temirtau local newspaper starting from 1980 until 1993. After collecting small descriptions, tagging and making preliminary analysis, I found out that there were two main phases in the environmental discourse. The change from one era to the other did not coincide with Perestroika or independence, but became evident to me in terms of the ways that topics and discussions were changing.

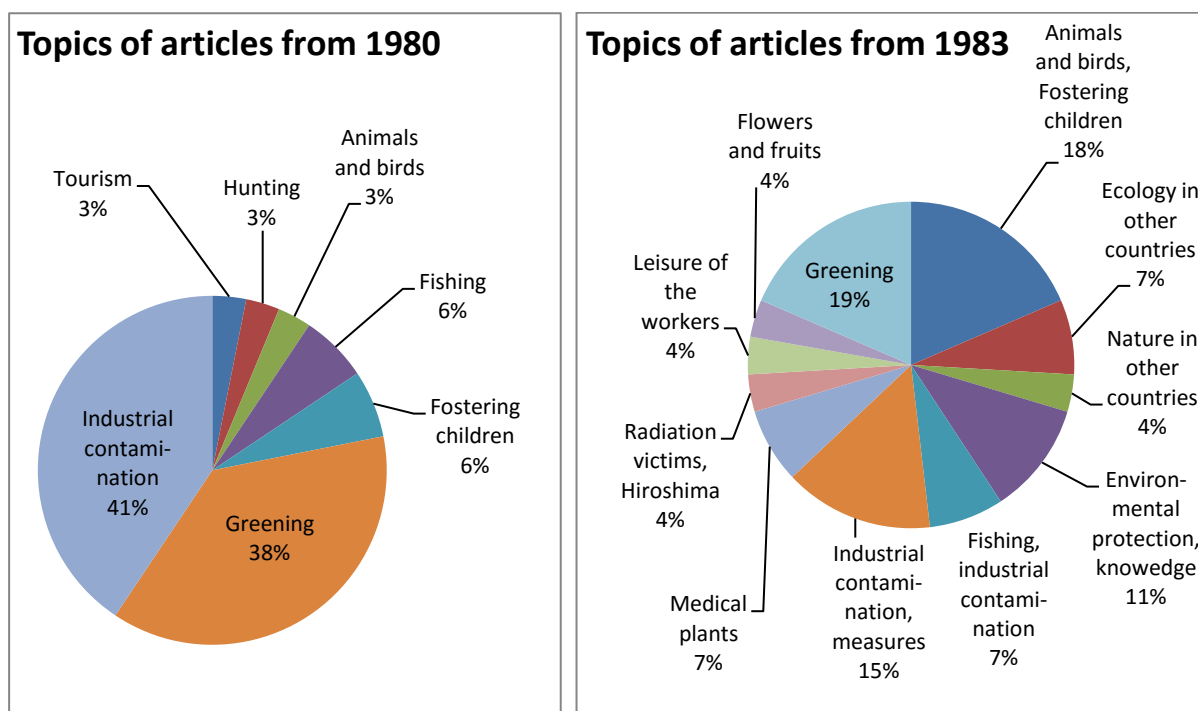
### ***The era of protection (the early 1980s)***

In the first years of the 1980s the *Temirtauskii rabochii* usually published materials on the environment with the frequency of twenty to thirty articles per year. Articles on the environmental issues predominantly appeared on the third page, sometimes (very rarely) on the second page of the newspaper. This could mean that the issues of environment were not the most important topic for the editors. On the other hand, it could also mean that on the third page the reader could see the information published with less control and attention from the state authority. Probably if some kind of disagreement or discontent with the state policy appeared, surely the newspaper would not have made such discontent visible on the first page, but in a less prominent location.

Three times a year *Temirtauskii rabochii* contained a whole page dedicated to nature, which bore the title "Nature and us". This rubric usually had articles on greening (planting trees and grass), environmental protection, industrial contamination and many generic articles about love for nature, addressed to an audience of children and their parents. This rubric occurred usually around June 5 of each year, because this date was named as International

Day of Nature Protection. The other two times were not related to a specific holiday, but served to recall this theme periodically (one rubric every four months). Repetitions in the repertoire of articles in these sections give the impression that “Nature and us” was one of the topics defined as necessary by the authority or by the editors, but general lack of knowledge or limitations on tackling more fundamental issues reduced the scope of these environment-dedicated pages to little more than mere reports on tree-planting.

The topics discussed in the relevant articles of *Temirtauskii rabochii* throughout the year are shown in the following graphs. The authors of the articles described and commented on damage to nature and to people’s health, as well as the measures that should be taken to reduce the environmental and public health impact of the factories in Temirtau. In the early 1980s much of the overall discourse on the environment was taken on in the context of the issue of planting trees or greening (*ozelenenie*). In the middle 1980s the range of topics expanded to include the issue of radiation (in Hiroshima) and of the links between industrial contamination and quality of life (fishing, vacation/leisure time, and food).



Many articles from the early 1980s in my sample contained the words *protection, to protect, or to preserve* in their titles.<sup>17</sup> News from Temirtau and from the USSR in general highlighted this latter aspect, while information about Western countries often contained the term *threat*. An article written in 1983 by a correspondent of TASS (Telegraph Agency of Soviet Union) reported on the activity of multinational companies based in the West and explained how the latter delocalized their production centers to under-developed countries in Africa, where they were causing dangerous pollution.<sup>18</sup> The article explained very clearly that those multinational companies were to be blamed for industrial contamination. The title of the article contained the word *threat* to emphasize the wickedness of such behavior and the risk it imposed on Africans.

At the same time, some articles carried optimistic titles, such as “Air over the city is clean”<sup>19</sup> or “Purification equipment works”.<sup>20</sup> It is significant, though, that these articles did not relate to Temirtau and referred instead to other cities or to what was presented at the VDNKh (All-Union Exhibition of Achievements of National Economy). I think it is possible that such titles and articles must draw a better picture for those readers who did not read carefully and just skimmed through the paper by running their eyes on the titles. Vice versa, it is also possible that these articles would have alerted the readers about the better situation in other cities, or on the technical availability of remedies to pollution, which however were not implemented in Temirtau. It is possible that *Temirtauskii rabochii* as a local newspaper was trying to blame the central authority for not giving to enough attention

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<sup>17</sup> For instance, 22% of the articles in 1980.

<sup>18</sup> Kulik, S. 1983. “Ugroza okruzhaiushchei srede.” *Temirtauskii rabochii* (further – TR) March 15.

<sup>19</sup> Correspondent of TASS. 1981. “Vozdukh nad gorodom chist.” TR, August 1.

<sup>20</sup> KazTAG (Kazakh Telegraph Agency). 1983. “Deistvuiut ochistnye sooruzheniia.” TR, April 26.



to Temirtau and the region, while elsewhere the situation was better or could have been improved if only someone at the republican or central level had had the will to do so.

Environmental protection, ecological problems, industrial contamination and people's worries about chimneys, pollution and bad air also fell within the scope of discussion. Some articles reported that ordinary citizens of Temirtau were concerned that the smoke from factory was being blown toward the city,<sup>21</sup> or that a cement cloud was hovering over a village near Temirtau because of the local cement plant and its inadequate purification equipment.<sup>22</sup> Further examples of this reporting on day-to-day concerns include articles that criticized a shop floor manager, who allowed acids to be released into the sewage system and who was punished for this with eighteen month of conditional sentence and a 1,000 ruble fine.<sup>23</sup> Apart from naming very concrete guilty persons, such as this manager, the authors attributed the responsibility first to the factories and their management. Research institutes were also charged for different mistakes in the construction designs for factories and purification equipment. An article that appeared just after a conference of the Society for the Protection of Nature pointed at the steering committee of the Society itself as responsible for many shortcomings in the work of environmental protection in Temirtau.<sup>24</sup>

The authors of the articles were inspectors of Society for the Protection of Nature, chiefs of the City Soviet (City Council), fishing and hunting inspectors, freelance (*neshtatnye*) and newspaper correspondents, local residents, chiefs of various departments of the factories *KarMet* (this was the name of the Temirtau steel mill in Soviet times), *Karbid* (the name of the carbide factory), and *Karaganda Cement* (the name of the cement factory), together

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<sup>21</sup> "Pochemu dymiat truby." *TR*, May 22 1980 and response article in *TR*, July 15 1980.

<sup>22</sup> Zaitseva, L. 1981. "Oblako nad posëlkom." *TR*, September 29.

<sup>23</sup> Ibraiev, A. 1980. "V nadezhde na 'avos'." *TR*, December 23.

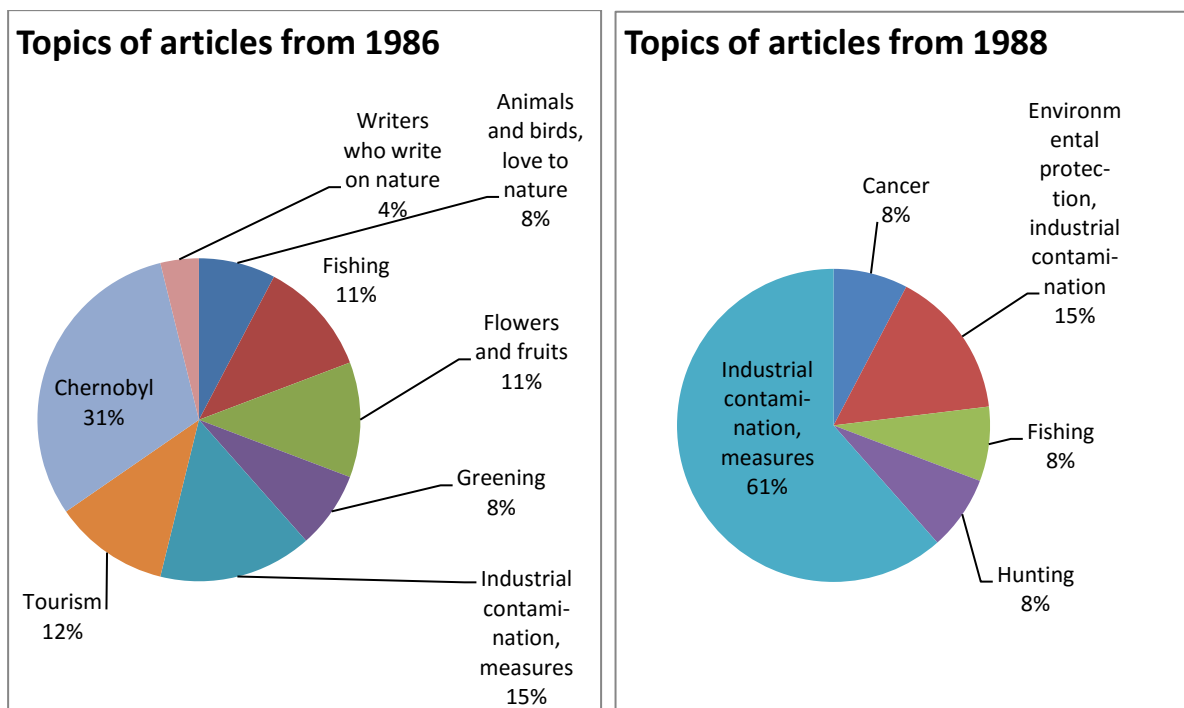
<sup>24</sup> Tumanova, T. 1980. "Aktual'naia problema." *TR*, April 10.

with research scientists from the botanical garden and physicians. In particular, the Chief Public Health Physician (*glavnyi sanitarnyi vrach*) was portrayed as one of the biggest experts, and the expertise in the field of environmental problems was attributed to the Public Health Department.<sup>25</sup> The articles written by this Chief Public Health Physician were sometimes published on the first page and contained information on contamination, pollution and measures that were taken by various factories and plants.

In 1986, the Chernobyl incident was of course at the center of attention. The subscription of the newspaper for 1986 does not make it possible to comment on how the explosion at Chernobyl nuclear power station was initially shown (because some issues are missing). However, starting from May 20th, around a month after the explosion, Chernobyl appeared almost on the first page of almost every issue of *Temirtauskii rabochii*. Yet, the newspapers reported more on donations for the victims than on the event itself. The incident at the nuclear power station was never discussed and was piously referred to as “common sorrow” (*obshchee gore*). The fact that the event was not described in any degree of detail also means that nobody took the risk to allocate any degree of responsibility for this disaster. The Chernobyl incident was presented more as a natural disaster, as if it were an earthquake.

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<sup>25</sup> Arkatov, A. 1981. “Za chistotu rek i ozër.” *TR*, January 17; Arkatov, A. 1981. “Okhrana prirody - zabota obshchaia.” *TR*, August 13. [NOTE: you have separated citations in your footnotes with paragraphs, but a footnote should almost invariably consist of a single paragraph.]



Perestroika and Glasnost together with reflections on Chernobyl gave an impetus to the people's worries about environmental problems. However, it took some time for people to react to Chernobyl and to Perestroika. The issues and discussions in the articles became more robust in 1988 (see the next part). The Public Health Department and the sanitary and epidemiological station (*sanépidstantsiia*) established a radiological team to monitor the radiation level in the region.<sup>26</sup> The issue of radiation was not clearly related to Chernobyl, but rather to scientific literature appearing at the time, which discussed data about possibility of radiation in mining regions.

### ***Glasnost: doubt and rethinking (the late 1980s- the early 1990s)***

The Glasnost promoted in the late 1980s brought open discussion of many topics and questions. In Temirtau this process was not revealing new information about industrial contamination (such information had been discussed, though with much prudence, in the previous years as well), but information about the consequences of the construction and

<sup>26</sup> Klimov, V. 1988. "Radiatsiia i my." *TR*, June 19.

reconstruction of various industrial facilities, which hitherto had always been presented as absolutely necessary. Some new installations, such as a water cooling reservoir, the water of which was to be used for the production cycle,<sup>27</sup> or a slag-processing factory<sup>28</sup> in Temirtau, are some examples of this kind. This equipment had been planned for a long time, and previously only positive outcomes were widely discussed. However, in the late 1980s *Temirtauskii rabochii* depicted these new facilities in a more nuanced way, where their effects were not necessarily exclusively positive. The water cooling reservoir, for instance, could not guarantee that the waste water would not be absorbed and would not go into Samarkand Lake through the soil or as a consequence of the high water level in spring.<sup>29</sup>

Thus, the late 1980s were a time of doubt and of rethinking about old and newly acquired knowledge. A reader of the newspaper would have gotten the clear idea that the ecological issues were more complex than one had thought before. This was the reason why later the Temirtau community (both ordinary citizens and chiefs of different factory departments) came to the understanding that expertise on ecology in the late 1980s had not been sufficient and that promoting and developing ecological education was important.

In this later period, Western countries were not shown as characterized by environmental problems that were different from those of Soviet Kazakhstan. Instead, they could become positive models. Austria, for instance was shown as an example where the ecological police worked well.<sup>30</sup> This was also part of a process of rethinking of the place of the USSR (and, on a much smaller scale, of Temirtau) on the world scene. Readers should not feel excluded

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<sup>27</sup> Oskin, D. 1989. "Eshchë raz o proekte pruda-okhladitel'ia." *TR*, February 16.

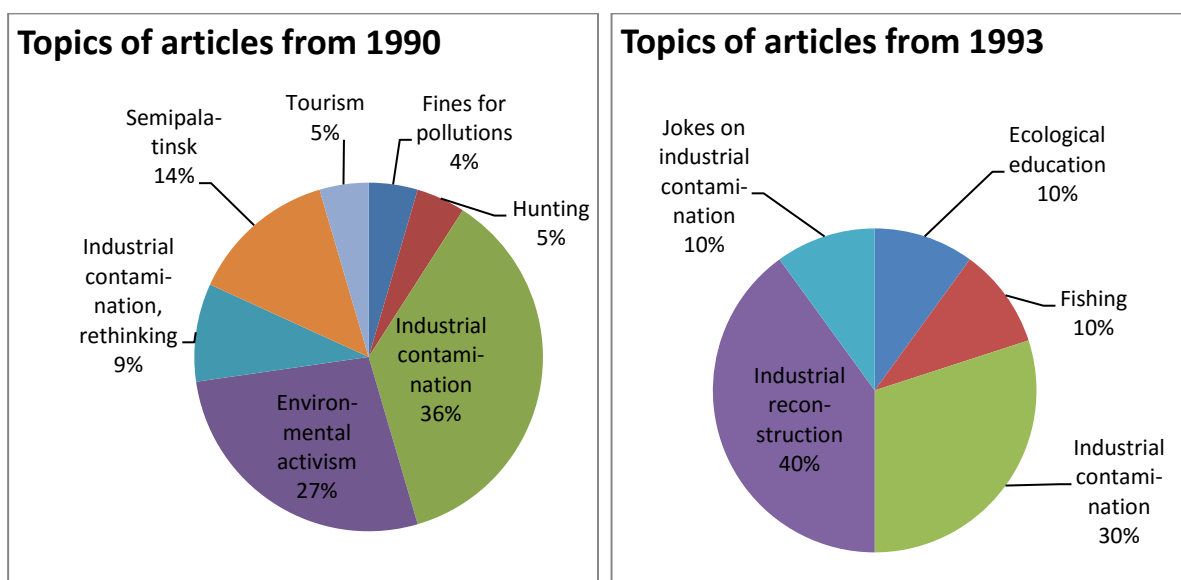
<sup>28</sup> Prenko, N. 1989. "Pervyi shag sdelan." *TR*, March 4.

<sup>29</sup> Oskin, D. 1988. "Neobkhodim zapas prochnosti." *TR*, December 29.

<sup>30</sup> Photo chronicle of TASS. 1989. "Ékologicheskaiia politsiia Veny." *TR*, November 14.

from world society, but they were portrayed as sharing worldwide problems that are not easy to solve.

The fact of facing the problems and seeking for explanations and solutions brought some residents to the idea that the population could be at risk of unrevealed dangers.<sup>31</sup> The events in Chernobyl and Semipalatinsk (where above-ground nuclear testing took place for almost forty years) had reinforced the feeling among the citizens that the state might be responsible for some unknown dangers.<sup>32</sup> If a newspaper reader had sought for the reason why such information was hidden, *Temirtauskii rabochii* provided an answer through the words of the chief of the trade union of the blast furnace shop-floor of the steel mill, who explained, “it was considered as indecent to upset the people with the data and unpleasant facts.”<sup>33</sup> Thus, the question of responsibility was reduced to concerns about the psychological well-being of workers.



<sup>31</sup> Kovalenko, O. 1989. “Poidët li urok vprok?” *TR*, June 13.

<sup>32</sup> Novikov, A. 1990. “Èto ne dolzhno povtorit’sia!” *TR*, October 20.

<sup>33</sup> Lakhno, E. 1989. “V dolgu u... sebia.” *TR*, November 30.

An interesting thing is also the fact that people started to make jokes about environmental problems and industrial contamination. An iconic example of this is a 1993 caricature in which a manager from the factory is asking an employee to energetically fan the wind away from the city with a ticket assessing a fine for environmental damage, in order not to let the smoke from the factory reach the city.<sup>34</sup> The cartoon shows that environmental problems intervened into the popular discourse deeper than before. It also shows that this sort of material was published in a more relaxed way and some degree of criticism was allowed. Yet, the target of such criticism was the plant management: responsibility was still attributed to them, rather than to the local or republican government or other agencies.



The protests and closing down of the nuclear testing site in Semipalatinsk, which happened only a few of years after the meltdown at Chernobyl, together with the information about radiation and its bad impact on health, led to social anxiety and to the emergence of environmental activists.<sup>35</sup> These activists often regarded as their main task to deny all proposals for further industrial construction work in Temirtau. Sometimes they even fell in disagreements with each other. For instance, in 1990, *Temirtauskii rabochii* published a rubric with the title “Two opinions on one problem”. The leader of environmental initiative

<sup>34</sup> Vasiukov, J. 1993. Picture in a rubric “Tvorchestvo nashikh chitatelei.” *TR*, December 18.

<sup>35</sup> Serikov, V. 1989. “Vnimanie: èkologija.” *TR*, June 29.

group Oskin spoke up against the construction of a new leather tanning shop near the carbide factory.<sup>36</sup> He thought that the place for this new facility was not appropriate and he found it outrageous that the construction had been planned and decided secretly. The other member of the initiative group explained that the project of the new shop floor had been only recently planned and aimed at using waste water from the carbide factory in order to reduce the amount that would be ultimately released into the environment. This second commentator meant that after evaluating all advantages and disadvantages everybody was convinced but Oskin.<sup>37</sup>

Such disagreements and the presence of a wide range of opinions on what was beneficial and what was inappropriate for the environment forced the community (both lay population and environmental specialists) to search for better ecological expertise. In an interview published in 1989, a factory manager answered the questions of an environmental activist about the prospect of building a slag-processing factory and said that “things are much more complicated and we [the factory] will involve science (*budem privlekat' nauku*)” in the decision-making process.<sup>38</sup> By discussing other shop-floor construction plans, the head of Public Health Department proposed that the “chemists and other competent specialists” should be invited for discussion and that “they could act as arbiters.”<sup>39</sup> Later on, in 1993, an article appeared on the first page, where a head of department at the professional institute in Temirtau stated that many people who worked in the field of environmental protection were basically practitioners or amateurs, because neither universities nor professional

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<sup>36</sup> Oskin, D. 1990. “Khochu vozrazit'.” *TR*, March 17.

<sup>37</sup> Novikov, A. 1990. “Vygodna ochevidna.” *TR*, March 17.

<sup>38</sup> Oskin, D. 1989. “Tochka zreniia.” *TR*, May 23.

<sup>39</sup> Lakhno, E. 1990. “V poiskakh istiny.” *TR*, January 9.

colleges were preparing specialists in ecology.<sup>40</sup> His agenda was clearly to justify the opening of a new vocational training at the institute. However, he was blaming all the environmental services in the city for failure and incompetence in solving environmental problems. He argued that the employees of the environmental services “were worried not about the problems of people, but about their wish to have a cushy and relaxed job.”

Besides showing the emergence of contestations on what represented “environmental expertise”, this article is also significant because it witnesses a very serious shift in the allocation of responsibility to state agencies of environmental protection. Until the early 1990s the responsibility for environmental problems and risks was exclusively attributed to the factories and their management, or to those research institutes which were designing factories.

To sum up, the late 1980s and the early 1990s, along with Glasnost and the rise of environmental and civil society activism, brought new ideas about environmental risks, ideas that the environmental issues are very complex and not unambiguous and ideas that a new kind of experts and expertise were needed. The allocation of responsibility slowly started to shift from the factory management to the experts.

### ***Crisis of trust?***

Hosking argues that the crisis of trust that today’s society faces is actually not a crisis but a shift to “strong thin trust”, or a trust in the quality of political institutes and policies, which is however based on weak knowledge (2014, 195). In the field of ecological expertise the case of Temirtau shows that “strong thin trust” had been a pattern for previous decades (1980s). The popular knowledge on ecological problems was scarce and monotone, because it was

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<sup>40</sup> Govorov, V. 1993. “Trebuiutsia professionalny.” *TR*, January 9.



based on the information given by the state institutions through newspapers, or the media in general. Nevertheless, the discourse showed that there was confidence that ecological problems are understood, as well as hope that these problems could be addressed and solved.

The example of a local newspaper in Temirtau shows that in late Soviet times more sophisticated scientific knowledge of ecology and industrial risks developed together with an emerging ecological consciousness. During the Perestroika period, the lay knowledge of environmental problems and solutions became an issue, raising questions whether this knowledge was adequate. The general lack of knowledge and expertise gave an impetus to scientists to develop ecological knowledge. However, lay knowledge was lagging behind and slowly lost its links with expert knowledge. In the 2000s, ecology as a scientific field started to produce trained experts or educated ecologists, whose main tasks were to provide ecological expertise to lay people, to represent an alternative voice through nongovernmental organizations or, in more general terms, to produce and strengthen links between lay and expert knowledge and to allow ordinary people the possibility to get the adequate data and to participate in decision making process through these nongovernmental organizations.

Employing Hosking's typology of trust I argue that in the late 1980s and in the early 1990s the Temirtau community experienced the shift from "strong thin trust" to "weak thin trust". The population faced the evidence that knowledge of ecological problems and their solutions was, first of all, not so simple and unambiguous. Secondly, lay people came to understanding that the knowledge they had possessed, that they had believed to be adequate and reliable, was not sufficient. Therefore, when people understood that their

knowledge and expertise were “thinner” than they previously supposed, participation shrank and trust weakened. I argue that the situation in Temirtau in the early 1990s cannot be characterized as one of distrust between the citizens and the state, because most of the residents of Temirtau have not left the city and continue to work at the steel mill (and to swim in the lake, for instance) today. They are concerned about the work and living conditions in Temirtau. They are complaining about smoke coming to the city and about their bad health. However, Temirtau’s population is passive in challenging official environmental policies. I think this occurs because in general, residents of Temirtau have faced the weakening of trust in state expertise very closely and hence have elaborated their own strategies of coping with environmental risks and do not react to the risks actively.

### **Chapter 3**

#### **Lay knowledge as opposition to expert knowledge**

The perception and evaluation of ecological risk depends on public trust/distrust. The main link between the people — their perceptions, attitudes and trust in the state’s care for their concerns — and purveyors of expertise is precisely lay knowledge. In the literature, lay knowledge is usually understood as opposed to expert knowledge. The opposition of expert and lay knowledge has been discussed extensively in the literature both in general terms and spelled out in various examples. In this chapter I discuss contemporary lay knowledge on ecological problems, health and industrial risks in Temirtau. I also discuss the opposition of expert and lay knowledge as it may be better understood through my analysis of ethnographic evidence. First, I give my understanding of what lay knowledge on health and environmental risk and danger in Temirtau consists of. Then I show who is perceived as expert in defining and evaluating ecological risks in popular discourse.

Scholars have developed a wide range of approaches to the question of the relationship between lay and expert knowledge about health. The democratization of health knowledge (Prior 2003) and greater access to medical information (Henderson 2010) has increased the interconnections between lay and expert health knowledge and has prompted scholars to argue for liberalism in accepting all sorts of opinions and giving more credibility to lay expertise (Popay and Williams 1996). Some scholars contend that the term “lay expertise” is an oxymoron (Prior 2003), because of the ambivalence of definition, but, in any case, lay notions (even with limitations due to subjectivity and exclusiveness of personal experience) are important for understanding social patterning of health (Popay and Williams 1996) and strategies of reasoning in lay interpretations in illness (Henderson 2010).

Scholars who study lay and expert knowledge of risk disagree about differences between lay and expert risk assessment and validity of expert judgments (Rowe and Wright 2001). Rowe and Wright argue that lay and expert risk notions can differ due to different factors, social and other, which sometimes makes expert knowledge not very distinct from lay notions, and as a consequence – not always more valid (2001).

Scholars discuss the opposition of lay and expert knowledge in environmental issues as well. One of the key differences between lay and expert notions of environmental hazard, as Liebow argues, is the absence of credibility given by experts to native expertise, which excludes everyday lay experiences from decision making, and in turn, leads to the distrust towards scientific expertise (1993). Wynne argues that lay assessment of environmental hazard is based on social and cultural identity and that “the fundamental interaction between scientific expertise and lay publics is *cultural*” (1996, 21). To sum up, lay and expert

knowledge are two opposed, but interconnected layers of knowledge. The relation between them is different in different fields of studies and changes through time.

I understand the lay and expert knowledge on ecological risk in the case of Temirtau as a set of lay and expert assessments of ecological risk in the future or danger for health in the present caused by the industrial contamination in Temirtau. They are the alternative notions of what degree of ecological risk is dangerous for people's health and life in the industrial surroundings of Temirtau, what the consequences of environmental pollution and contamination in Temirtau are, and what to do about it.

I will show, in the case of Temirtau, what ideas of health and ecological risk lay people have. Then I will try to answer to the question of what residents think an expert is, and what they think s/he does in defining and evaluating of ecological and health risk. I will offer my own definition of *expert* and *expertise* and identify patterns in the way knowledge and information are related to specific individuals and groups from the residents' point-of-view. I also want to understand, what the relation between lay and expert knowledge is, and whether there is something in between in the case of Temirtau and how this opposition in knowledge affects the understanding of ecological expertise and public trust in it.

### **Lay notion of health**

The lay notion of ecological risk in Temirtau is usually closely connected and sometimes intertwined with the notion of health. The residents of Temirtau tend to relate these notions to each other and name the environment as one of the key factors in determining good health conditions along with healthy food and rejection of "bad habits (*vrednye privychki*)."

In scholarly debates, researchers have demonstrated that in post-Soviet countries people tend to connect health with absence of illnesses (Abbott et al. 2006; Hughner and Kleine 2004). Abbott et al. (2006) and Blaxter (1993) argue that health is often viewed as a complicated and multifactorial concept, but using emotional and descriptive language people tend to present health as absence of illness or as normal mental and physical well-being and appearance. Lay people define health also through the presence of a good mood, as requirement for efficient daily life, and as ability to work. D'Houtard and Field identified the tendency to define health as the ability to work as something specific to the working class, whilst the middle class tends to identify health with well-being (1984). In my sample I did observe some social patterning in defining health.

First of all, health is defined by residents as a condition of being not ill, physically and mentally, or as a condition which enables people to work, to study and to move. Ermek (a young resident of Temirtau, who is the son of a steel mill worker and who has worked himself as contract worker at the plant and later on in the municipality) states that if he says he is healthy, it means he has treated 90 percent of his illnesses (*na devianosto protsentov podlatal svoi bolezni*). Marina, a young female contract worker at the plant, defines health as the condition “when nothing bothers and nothing hurts (*nichego ne bespokoit i nichego ne bolit*).” Aigul (a young woman, who worked as a contract worker at the steel mill and left Temirtau one year ago) says that when a person is not healthy, this person cannot work and has no money (*net zdorov'ia - net raboty, net raboty - netu deneg*). Lena (a female respondent in her mid-thirties, who has a degree in nursing and raises now five children) defines health as “a harmonious condition of soul and body (*garmoniia mezhdou dushevnyim i fizicheskim sostoianiem*), which allows moving within the city, studying and working.”

Madina, a middle-aged woman born in Temirtau but who left for a better life more than ten years ago and has a degree at an American university, defines health as “the condition, when a person feels comfortable (*kogda komfortno*).” For her it is a system of physical and psychological elements which contribute to the condition of feeling well and free of illnesses.

Whilst some Temirtau residents define health as a gift given by nature (*podarok ot prirody*) or as treasure, others define it as a result of looking after oneself and of a healthy life-style. For instance, Ermek’s and Madina’s mother, Nazira, who worked for many years in the steel mill office (i.e., as company worker), states that her health is the result of her existence (*rezul’tat moego bytiia*). Ermek himself thinks that sport, and precisely weightlifting, is essential in Temirtau. “Since our ecology is not as it should be (*tak kak ékologiya u nas ne ta*), and everything accumulates in the body, only weightlifting can make it go out.” Thus, health, well-being and lifestyle are connected mostly by residents of a higher educational level and a higher social position.

Healthy life style as a life choice is closely related to class consciousness. According to Weber’s concept of lifestyles and life chances, social conditions and social class determine life chances (Cockerham 2001). People can choose different paths of behavior from those alternatives that they have according to their chances. “The life chances include class, age, gender, ethnicity, and other relevant structural variables that shape lifestyle choices. The choices typically involve decisions about smoking, alcohol use, diet, exercise, and the like” (Cockerham 2001, 12). The question of class consciousness, life chances and life choices in Temirtau is difficult to discuss, because there is no clear social stratification. However, as Trevisani argues, the Temirtau community is divided in two segments of company (e.g., with

stable employment) and contract workers (Trevisani 2014). The group of company workers (with presumably higher social position in comparison to contract workers) and their descendants tend to relate health to healthy life-styles, although in general almost all Temirtau residents tend to define health as the ability to work, which underscores their working class consciousness.

There is also a pessimistic attitude, whereby some residents deny the possibility to define health as an available option. One of the young respondents answered that “[she does] not say ‘I am healthy’ at all (*ia tak ne govoriu*)”. This is true for the elderly factory workers as well, who say that to be healthy is not possible at all (*zdorovym byt’ voobshche nevozmozhno*). I assume many residents suspect that they should be unhealthy due to evident ecological problems and anticipate it even without reference to exact information on their illnesses (i.e., they cannot say something concrete but just assume that their health is bad).

The question of health is one of the key points of discussion in daily life at the factory. Factory workers have a more complex idea of health. They define health in terms of work safety, as the absence of injuries, as the absence of threats to life, or as a condition in which the safety of life at the work place is secured. Marina (a young female contract worker) assumes that in order to be healthy, one has to care for one’s health at the workplace (*nuzhno berech’ sebia na rabote*). Another interesting pattern in defining factors of being healthy among factory workers is the idea that it is necessary to leave the city for vacations or even more often. Nikolai, an elderly factory worker, and Venera (both of them came to Temirtau from Russia many years ago) think that leaving for vacations is essential. Venera even believes that working at the steel mill is the only possibility to get enough money to go

for vacation. It then becomes a vicious circle, where work at the plant is the only chance to get rid of the bad health consequences caused by this plant.

Thus, residents of Temirtau define health in general through absence of illnesses and as a good physical and mental condition. The company and contract workers of the steel mill tend to identify health as the ability to work and sometimes relate health to safety at the workplace. Residents in higher social position (which are usually company workers and their descendants) relate health to healthy life styles.

### **Lay notion of ecological risk**

Whereas literature defines ecological risk as a rating of the possibility or threat of negative changes in the environment, or the possibility of the long-term negative consequences of these changes, the popular ideas or notions of what is ecological risk differ somewhat from scholars'.

Ecological risk is most often perceived by my respondents as the bad effect that the ecological situation or exposure to industrial pollution in Temirtau and the region has on the above-mentioned health condition or on life as such. Temirtau residents do not use the term of ecological risk in daily life, but they use the words *ecological situation*, *ecological problems*, *contamination* and *air pollution*. This shows that many Temirtau citizens attribute negative characteristics to ecological risk.

Only one of the respondents, Lena (a city dweller), could think of ecological risk in more neutral way. For her, ecological risk was one of the key factors (along with food) which determines, whether a person will live a healthy life, or at least a life free from illnesses. For Lena, who has no experience of work at the factory, ecological risk is the factor that can make a town or region a desirable or undesirable place for living.



Other respondents have a very concrete negative picture of the ecological risk, though it derives very often not from Temirtau experience. For Marina it is “a terrible, dirty and stinky cloud, looking like a mushroom radiation cloud (*strashnoe, griaznoe, voniuchee oblako tipa iadernogo griba*).” For Aigul it is literally “radiation” and for Ermek it comes to concrete places such as Chernobyl, Hiroshima and Nagasaki. I assume that they derived this notion of ecological risk from the media. As I have shown in Chapter 2, the ecological anxiety and consciousness emerged (or at least intensified) right after the ecological disaster at Chernobyl, when the topic of radiation was widely discussed.

For Madina, who left Temirtau, ecological risk is embodied in the “yellow teeth of the Temirtau residents as a sign of health problems”. Thus, she again relates ecological risk to health.

Venera (a factory worker with a long experience) relates ecological risk to the local catastrophic events such as a flood in a village, caused by the water coming from rivers. “The factory needs the dam, which is now in a bad state; therefore [the authorities] let water go to villages in order to protect the dam.” Venera is very conscious about health hazards caused by the plant. She believes that all the plant workers are conscious about environmental problems and only non-factory workers can be so naïve as to evaluate the ecological risk in Temirtau as low.

To sum up, residents of Temirtau understand the term ecological risk in many ways. The term itself is seldom used in daily life. This might be one of the reasons why some citizens relate ecological risk to the ecological situation in Temirtau while some relate it only to disasters.

Another key issue is the estimation or evaluation of risk and who is able and/or responsible to make such an evaluation. One of the strategies for coping with risk is to make the evaluation oneself. I will consider the lay perception of who is an expert in the next section, whilst popular attitudes and perceptions of ecological risk and ideas of how to cope with this risk is the topic of Chapter 5.

### **Who is an expert?**

The notion of experts on risk in environmental studies is not very well defined. However, the literature on the notion of who an expert is in the sciences is extensive.

A standard online English World dictionary defines an *expert* as “a person who is very skillful or highly trained and informed in some special field”, whereas *skill* is a “great ability or proficiency; expertness that comes from training, practice, etc.”<sup>41</sup> Thus, an expert is somebody who is either trained and informed or experienced by practice. The scholarly literature is far from agreeing that this kind of definition is accurate, because it is very difficult to define what experience and training are and how much is needed to be an expert.

Scholars comment that although experts have been objects for study for over a century (Shanteau et al. 2002), there is still no agreement about what criteria define whether to call somebody an expert or not. Shanteau et al. name different criteria: they are experience, knowledge, certification, social acclamation, consistency (or within-person reliability), peer consensus, discrimination ability (ability to perceive differences between similar, but not equivalent, cases) and behavioral characteristics (2002). All these criteria help to identify an expert and Shanteau et al. try to elaborate a formula, which they call the CWS (Cochran-Weiss-Shanteau) approach. These authors agree that consistency and discrimination ability

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<sup>41</sup> Neufeldt, V. 2014. *English World dictionary*. Accessed March 26, 2016. [http://world\\_en.enacademic.com/25508](http://world_en.enacademic.com/25508); [http://world\\_en.enacademic.com/68106](http://world_en.enacademic.com/68106).

are the most important skills for establishing expertise. They propose to rely on calculated ratio of discrimination to inconsistency to define an expert (Shanteau et al. 2002, 258). It means that when an expert demonstrates his skills of seeing differences between cases and when s/he does it with greater consistency, then he gets a larger score. However, when Shanteau et al. are supporting their arguments, they compare the scores of sample experts with the scores of the recognized experts, which means that the key point is basically compliance with a standard. It is also worth mentioning that they base their conclusions on the basis of the study of auditors, agricultural judges, and personnel selectors. Another scholar, Day (2002), discusses the definition of expert by focusing on experts in radiography. For him an expert is defined by knowledge, experience and conformity with a prototype; the latter, however, might or might not exist in reality. His main conclusion seems to be that “there is no single ‘expert way’ to perform all tasks” (Day 2002, 69). This is true for specialists or experts in the evaluation ecological risks, as well. I argue that my respondents define expertise in a way that does not, however, fully coincide with either the CWS approach, or Day’s description. In the following, I will use the definition of an expert given by the English World dictionary above as a starting point and then elaborate based on views of my respondents.

In the case of Temirtau the ambivalence of the term expert on ecological risk is more than evident. Based on Temirtau residents’ opinions and media, there are different kinds of experts in defining ecological health risks and ecological problems. At the initial stage I assumed that the educated ecologists (*ékologi*), who work in eco-organizations, such as *EkoMuzei* (a non-governmental organization carrying out research and projects on environmental protection) or *EkoShkoly* (schools that include special lessons on ecology in their curriculum and that participate in ecological projects and research), must be regarded

as experts in environmental risks and hazards. I have to mention as well that in Russian (all interviews were conducted in Russian) people usually use the word *ékologi* in the meaning of educated or trained scientists who study ecology and not often in the meaning of the environmental activists. However, the citizens and city authorities (and the *ékologi* themselves) do not always perceive trained *ékologi* as being experts in environmental health risks and ecological hazards.

Replying to the question of measuring ecological risk the citizens of Temirtau attribute the expertise to *specialists* who have and work with statistical data. They can be *ékologi*, engineers, somebody who works in ecological department in city administration or environmental services, municipal or independent. Going back to the idea that many Temirtau residents originate from families who had strong Soviet traditions and their opinions are inherited from that time, many Temirtau residents assume that the crucial point on defining specialist or experts on ecological risk is the fact that they obtain and work with numbers. Lena, a city dweller, calls the specialists, who can measure ecological risk, “*bukvoedy*” (letter-bound persons, pedant or hair-splitter) and she assumes that exactly their pedantry allows them to measure risk.

Most respondents in my sample usually refer to the individuals who can measure the ecological risks (that was one of my questions) simply with the word “specialist”. Venera (an elderly company worker) believes that those specialists do not necessarily tell the truth as they know it and are even paid to deceive people. “All ecological services, municipal or independent, they all lie. They all understate the numbers (*zanizhaiut tsifry*).”

Another respondent, Aigul, a contract worker who left Temirtau recently, named *ékologi* as people who can measure risk. The main factor in defining an expert for her was the fact that

they have equipment to measure. “*Ekologi* have their own various tools (*raznye svoi pribory*) for this [measurement of risk]”.

Sometimes the roles of measuring and calculating are distinguished. Ermek, a young descendant of company worker, thinks that “*ékologi* should make measurements, and engineers should calculate the maximal and minimal values (*ékologi dolzhny izmeriat', a inzhenera dolzhny vyshchityvat' maksimal'nye i minimal'nye velichiny*).”

Thus, tools, sensors, equipment and statistical numbers define an expert in measurement of ecological risk in Temirtau. In lay knowledge, an expert is somebody, who obtains, measures or deals with numbers or with equipment, which allows getting numbers.

The above-mentioned *ékologi* from the environmental organizations fit the definition of expert as trained and experienced specialists. They possess and work with data, which they mainly acquire independently. However, there are other agents, who are the employees of environmental services and departments in the municipality which are actually opposed to *ékologi* because their position allows them to participate in decision-making process. This opposition can be observed, for instance, in an article I have found in media. The article discussed the problem of dioxin content in the sand used for children playgrounds.<sup>42</sup> An independent agency from Czech Republic checked the sand and reported the level of dioxin. However, the initiative of sand replacement has died at a higher level:

Last summer, when the Czech experts (*cheshskie éksperty*) discovered the dioxin at the playgrounds for the first time, the Temirtau city authority reacted immediately. First, they even wanted to follow the advice given by the ecologists (*dazhe khoteli postupit' tak, kak sovetovali ékologi*) who suggested replacing the soil. But this did

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<sup>42</sup> “*Ékologi Karagandinskoi oblasti snova nashli otravu: v ogorodakh, v iaitsakh i v vode.*” May 3, 2015. Accessed April 25, 2016. <http://www.zakon.kz/4708415-jekologi-karagandinskojj-oblasti-snova.html>.

not happen. The chemists, who work for the state (*khimiki, rabotaiushchie na gosudarstvo*), have analyzed their own sample from the Temirtau playgrounds. And they reported that no exceeding of limits was registered.

Thus, *ékologi* are not always recognized as experts, at least in the media, because they are actually excluded from the decision-making process. The explanation could be that these *ékologi* are not viewed as experts by state and municipal authority.

The above-mentioned quotation from the newspaper shows three terms used by media to define and to differentiate experts on the Temirtau scene and this differentiation is based on relation to power. Along with *ékologi* and employees of state services and departments, which I have already mentioned, the third group of environmental specialists consists of foreign experts.

Going back to the definition of an expert from the dictionary, an expert is someone who is skillful in a special field. One of my respondents, Mikhail, whom I had supposed to be an expert at the initial stage of my research, was a person who acquired a certain degree of expertise by working on a project of cleaning the Nura river of mercury. This operation had been outsourced to a foreign organization. His opinion about the ecological situation on Temirtau and environmental risks was unequivocal: “If you want to understand the environmental health risk in Temirtau you have to go to the cemetery. It grows before your very eyes (*ono rastët na glazakh*). The age at death there is 45 years. There are some people who manage to live longer, but it is rather the coincidence of the other positive factors.” It is difficult to evaluate whether this is an exaggeration or not, because the data on mortality are very difficult to obtain.

Taking into consideration my respondents' opinions and media reports, I argue that Temirtau residents perceive *ékologi* in Temirtau and the region as specialists or experts in the sense of being trained, experienced and possessing the independent statistical data. However, the state authority does not regard *ékologi* as experts and sees them as amateurs who are intervening uselessly and are worried too much about unimportant things.

Rowe and Wright argue that "in many situations ... it may be that the title of 'expert' is conferred on those who hold particular roles rather than on the basis of the known accuracy of their risk judgments" (2001). In the case of Temirtau, the state authority gives the role of experts to state agencies and those who work for them.

This ambivalent position of the *ékologi* is reflected in their attitude to the residents of the city. On the one hand, *ékologi* think that because of their tendency to adapt psychologically to their situation the citizens cannot evaluate the danger themselves. Hence they cannot be blamed or judged for lack of understanding or underestimation of risk hazards. Alexander, the head of the *EkoMuzei* says that the ecological risk for the Temirtau citizens is the "taste of 'butter' and professional health hazards simultaneously (*vkus masla i professional'nye vrednosti odnovenno*)." By saying this, he means that the industrial ecological risk with all bad consequences is an inevitable outcome of advantages of the well-paid jobs at the steel mill. Giving priority to the economic benefits, citizens are not able to evaluate the risk and danger.

On the other hand, the *ékologi* point out that the citizens often overestimate the environmental hazard that comes from the plant and underestimate the air pollution from the vehicles (based on the interviews with Alexander from *EkoMuzei* and Irina from *EkoShkola*). Thus, the *ékologi* still attribute the prerogative to estimate the risk to Temirtau

residents notwithstanding their lack of knowledge, adaptation ability and economic prejudices. Yet, while *allowing* such estimation, they consider it as marred by ignorance and imprecision.

Moreover, Irina judges the ordinary citizens themselves by saying that only poorly educated people could let their children play in playgrounds in the vicinity of roads with heavy traffic. Alexander assumes that Temirtau residents should be worried themselves about how to improve the environmental situation, and that the people who are concerned about the danger already left the city. Thus, the *ékologi* attribute, on the one hand, non-competence to the residents of Temirtau. More than this, they consider them unable to be competent. On the other hand, *ekologi* blame Temirtau citizens for their absence of desire to be competent.

To sum up, based on my interviews and observation, the ecological expert body consists of three major groups of experts. They are: *ékologi*, employees of state agencies and services and foreign experts. Only one group — the employees of state agencies and services — is empowered to take decisions. Nevertheless this group of experts is separated from the ordinary citizens and from *ékologi* by mutual distrust. On the one hand, these agencies do not trust and listen to the voice from below. On the other hand, the citizens together with *ékologi* do not trust and do not listen to state expertise and to suggestions that come from these state services and ecological department. A second group of experts is the group of the foreign practitioners, who possess the knowledge and experience, but they use it for their own professional purposes and do not really contribute to the social understanding of risk. Apart from media sources, only *ékologi* from my sample mentioned foreign experts, whilst Temirtau residents did not refer to them. A third group of experts comprises the



*ékologi*, who are trained and experienced in the field of environmental danger and risk. They are perceived by a certain part of the population as being specialists or experts (based on the assumption that *ékologi* are specialists with knowledge, equipment and data). However, these *ékologi* themselves, together with the citizens, are well aware that they are involved but not really influential in the decision-making process. The city authorities often invite the *ékologi* when important environmental questions are discussed, but their participation is often purely formal. Alexander, the head of the *EkoMuzei*, commented on the question of the dioxin in sand: “The solution for this situation is also very easy and we have spelled it out ten times already, but there is indolence again (*ěto tozhe kakaia-to inertnost'*)... Even when we meet with the city government, they say: ‘Yes, yes, this is good, this is easy... this must be done...’ And that is it (*i vsě*).”

Nevertheless, *ékologi* are important, because they are intermediaries between lay persons and authorities in providing ecological education to the citizens; in turn, they could be very efficient providers of lay expertise to the high level of decision-making agencies, but they fail to do so. This intermediary link could make public trust in ecological expertise stronger, but as of now it is still too narrow to provide adequate feedback and to improve communication between the upper and lower parts of society (see: Rose, 1995).

Liebow argues that the gap between experts and lay persons should be reduced and it is essential that lay persons are involved in decision making process when environmental hazards are discussed (1993). In Temirtau, not only lay persons are excluded, but even the ecologists who are usually perceived by lay population as being specialists. This gap between lay and expert knowledge is not only an *education gap* or *knowledge deficit*. It is deeply embedded into power relations and institutional trust, which I discussed in Chapter

2. In the next chapter, I will examine more closely what sources lay knowledge is based on and how large the above-mentioned knowledge deficit is.

## **Chapter 4**

### **Sources of lay knowledge**

In order to understand the nature and contents of lay knowledge on health and on the nexus between the latter and the environment, it is also important to look at the sources from which non-specialists derive their information. This will also shed light on the way lay and expert knowledge influence each other and circulate in different social milieux, generation, and media. The main sources of lay knowledge are traditional media (television and newspapers), the internet and social networks, as well as information provided at schools and gossip or rumors.

The media, in particular, are extremely important in shaping of the lay perceptions of risks and the development of trust or distrust towards state and city authorities as decision makers. Hosking, in his book about trust (2014), brings an example that people who travel very often by air usually do not reflect too much on qualifications of the pilot of the airplane and do not check “every rivet, joint and fuel duct in it” but simply trust the air company, or, to be more precise, trust the information that the planes of this air company never or seldom crash, which is provided by the media (Hosking 2014, 3). When we discuss the current media, a large part of the information comes from the internet and particularly online social networks. The internet is an important source, but the newspapers as published on paper are generally perceived as more reliable and authoritative, because they are not as changeable as internet links.

Textbooks are a source of lay knowledge provided to school children and do not shape the adult perspectives so much. Gossip and rumors are very interesting but are a controversial source of knowledge due to their temporariness, lack of evidentiary support and their appeal to the sensational.

In Chapter 2, I presented an analysis of the newspapers from the late Soviet and early post-Soviet periods in order to discover and follow the paths how ecological expertise and trust were taking form and were functioning, and now I will describe the sources of lay knowledge today.

### **School and textbooks**

Ecology is not an obligatory subject at school and only senior students of the tenth and eleventh grades in some secondary schools study ecology one hour a week (Bakirova, 2012). As with most of subjects, ecological knowledge is usually a part of the general knowledge that children should acquire at school. In the case of ecology, it can even be called additional information since it is an optional subject. However, if some school children decide to study ecology later on at a college or university, this knowledge can serve as the basic foundation. Nevertheless, I consider that the information provided in textbooks and learnt at school is a part of lay knowledge and not expert knowledge.

There are some schools in the region which participate in the program called “*EkoShkoly-Kazakhstan*” (EcoSchools-Kazakhstan). They have more hours of ecology in their curriculum. In the *EkoMuzei*, I discovered a set of programs and lessons for these kinds of schools. This program can be also used for the specific stand-alone lessons of ecology at ordinary (non ecological) schools where schoolchildren get the ecological knowledge within the framework

of biology, geography or other natural sciences.<sup>43</sup> These lessons focus on topics such as sustainable development, air, energy, water, transport and waste. This information contains mostly numbers that the children are expected to memorize and practical tasks, such as, for instance, to conduct an investigation of a ventilation system of the school or to grow Geranium and Chlorophytum.<sup>44</sup> The lessons are focused primarily on the idea that ecological concerns are the citizens' responsibility. The program for these ecology lessons looks interesting, although the number of schoolchildren who take them is very small. They are basically only the schoolchildren who study at these *EkoShkoly*. The textbooks for *EkoShkoly* represent the ideas of the publisher about what the relation between agencies dealing with environmental problems in the local community is. One of the instructions for *EkoShkoly* suggests conducting a role-play called "Zavod" (factory)<sup>45</sup>:

For this purpose you have to make cards for participants – mayor, ecologists, local residents, journalists, the factory owners, physicians, etc. – identify their relevant role information. According to the scenario (*po legende*) the factory is a major source of employment and income of the local residents; however, the health of the local people is deteriorating, because the factory has no money to install purification equipment.

This quotation shows the real concerns of citizens: health problems, shortage of money and installation of purification equipment. Again, we can see how the author of the task perceives in the hierarchy of expert vs. lay knowledge. Residents, town's authority, factory owner, ecologists and physicians are all shown as autonomous agencies.

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<sup>43</sup> The copy I have discovered in *EkoMuzei* in free access was printed by a small publisher in 2005 and the number of publishing was 1,400 pieces.

<sup>44</sup> *Posobie dlia shkol-uchastnits proekta EkoSHkoly-Kazakhstan*. 2005. 3rd edition, Karaganda:OO "Ekoobraz", 38.

<sup>45</sup> *Ibid*, 34.

Textbooks of the *EkoShkoly* provide statistical data with references to state statistical committee.<sup>46</sup> The authors of the materials are specialists from ecological organizations and foreign experts from the UK; the project of ecological schools is supported by the Ministry of Education and Science of the Republic Kazakhstan.<sup>47</sup> However, as I mentioned earlier the number of textbooks (for instance, 1400 in this particular edition) and number of schoolchildren, who take these classes is small (one school in Temirtau). The circulation of this knowledge is probably limited, and is unlikely to influence lay knowledge in a city with around 185,500 residents.<sup>48</sup>

### Periodicals

At the *EkoMuzei* everybody can find the ecological journal *Ia i Zemlia* (Me and the Earth), where students can publish their contributions.<sup>49</sup> The young correspondents write articles based on their experiments, trips and projects. The journals are printed in Karaganda at the Glassir publishing house in number of 1333 copies of each quarter-annual issue (as indicated in the April-June 2015 issue). The copies are distributed presumably at the above-mentioned ecological schools and therefore could hardly be counted as sources of lay knowledge beyond them.

Nonetheless, both textbooks and journals show an interesting tendency. All the materials are published exclusively in Russian and the majority of them are written by authors whose names suggest they are non-Kazakh. It shows that ecological knowledge, which was built during Soviet era, acquired an authoritative status through the Russian language.

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<sup>46</sup> Ibid., 25.

<sup>47</sup> Ibid., 2.

<sup>48</sup> Komitet po statistike. Accessed May 23, 2016.

[http://stat.gov.kz/faces/wcnav\\_externalId/homeNumbersPopulation?\\_afLoop=35889190986507483#%40%3F\\_afLoop%3D35889190986507483%26\\_adf.ctrl-state%3DdimtylrI0l\\_71](http://stat.gov.kz/faces/wcnav_externalId/homeNumbersPopulation?_afLoop=35889190986507483#%40%3F_afLoop%3D35889190986507483%26_adf.ctrl-state%3DdimtylrI0l_71).

<sup>49</sup> Molodye reportery. Accessed April 25, 2016. <http://yre.ecoobraz.kz/>.

## Gossip

Another source of lay knowledge is gossip or rumors. Nigel Rapport, in *The Routledge Encyclopedia of Social and Cultural Anthropology*, defines gossiping as a form of interaction between members of society, which is deeply embedded into the local context and draws strong interest from anthropologists as a tool by which individuals “examine and discuss together the rules and conventions by which they commonly live” (2010, 338). “Through gossip, people make sense of what surround them, interpreting events, people, and the dynamics of history” (Besnier 2009, 3). Hence, lay knowledge must be connected to gossip even more than to other sources.

In the case of Temirtau, reference to gossip is made often in relation to the issue of air pollution. All respondents mentioned that the factory produces gas emissions or releases some other smoke, but the time of these emissions are unclear. Some residents assume that this happens in the morning, some residents believe it takes place in the evening, but it is very interesting that all of them mention concrete hours and they are absolutely sure about this. All the respondents say that they can visually see the smoke, but the information about the hours comes generally from the rumors.

My informant Irina, who is an ecology teacher, refers to the telephone hotline, which the *ékologi* of the city have introduced to “gather information”. Irina mentioned that residents of the city often call this service and report about smoke releases on Friday and Saturday evenings and she thinks it happens at the time “when nobody can check”. Even if the *ékologi* report the unsanctioned smoke release to the state controlling services, they can react only on Monday morning, when everything has already stopped. One may conclude that nobody really knows what these releases are and when they happen, but everybody

heard about them and made his/her own argument based on these rumors and on his/her visual experience.

Further evidence suggesting that rumors are one of the sources of knowledge source comes from one of my respondents. I asked Aigul (a contract worker who lives now in Almaty) to identify the sources, which she would use to get additional ecological information. After long reflection, she said that the best way to find something out would be making a kind of survey among residents. “Otherwise you can get [the information] from nowhere (*bol'she uznat' neotkuda budet*). Even if something is discovered [by experts], it will be hidden [from official discussion]”. For her, the rumors can give the valuable and reliable information. The rest of the information is lies. Thus, one can see the weakness, if not absence of trust in all official information. Lay citizens give some credibility to lay knowledge based on personal experience and some credibility to *ékologi*, although the latter have limited influence in terms of decisions.

### **Internet resources**

Temirtau residents do not seem to be very active in the production and sharing of internet-based information. There are, however, a few notable exceptions. A video made by a Temirtau resident shows that the air pollution made it impossible for a car to stay clean after a night spent over in Temirtau.<sup>50</sup> The author of the video definitely blames the factory for the pollution by saying “somebody has claimed credit (*kto-to tam khvalilsia*) because new filters were installed at the factory”. The author of this video refers to statement of factory management about successful installation of purification equipment and assumes that the

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<sup>50</sup> Vaerakz Kodah. 2014. “Privet Mittalu.” Posted on June 25. Accessed April 25, 2016. <https://www.youtube.com/watch?v=-fgZVUESaho>. The video has 164 views, two “likes” and one comment posted one year ago (in 2015).

facts (thick dust on the car) show the opposite. This video has only one comment, which says that a car left at the territory of the factory near the coke plant cannot be cleaned anymore at all (because of the acid in the air). Despite this example, internet resources are generally either not very popular or show the apathy of Temirtau residents towards the information made about ecological problems.<sup>51</sup>

Madina, who left Temirtau many years ago, mentioned in our interview that she noticed how actively environmental issues and problems are discussed, for instance, in Almaty or Atyrau on social networks, such as Facebook, but she noticed that if something negative is said about Temirtau and its ecological situation, there are no debates. She sees two possible cultural reasons for that. One is the habit of “following the Soviet rules (*prisutstvie sovetskogo poriadka*),” which is the Soviet legacy. She calls Temirtau *Kazakhstanskaia Magnitka* in order to underscore that Temirtau has its strong ties to Soviet past.<sup>52</sup> She links the Soviet time to the idea that people were not putting up resistance to environmental contamination, because they tried to maintain order and to follow the rules. One of the rules was to believe or to trust that everything provided by state was under control, checked and not harmful. Madina makes a contrast to the contemporary state. She refers to the situation in Soviet times with the word “order” (*poriadok*), which means that the opposition to Soviet time for Madina is not only in active participation and resisting, but also in people’s perceptions and trust into state. The second reason, as she believes, is a cultural peculiarity of Kazakh people from Middle Horde (*Srednii Zhuz*), who are calm, decent (not rebellious) and very intelligent in comparison to the Kazakh people from other Hordes. I think it is

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<sup>51</sup> See another video to compare: “Tragicheskoe vystuplenie.” Posted January 5, 2016. Accessed March 15, 2016. [https://www.youtube.com/watch?v=ek\\_JfM8bD\\_A](https://www.youtube.com/watch?v=ek_JfM8bD_A). This is a video about an accident in Temirtau swimming pool. The video gathered around 14,500 views and 8 comments within two months.

<sup>52</sup> This is a name for Temirtau, given based on similarities with Magnitogorsk city and Magnitogorsk metallurgical plant.



important that some residents (in this case this is somebody, who left Temirtau and can compare to the notions and behavior of other Kazakhstani citizens) notice that popular discourse in Temirtau differs from the notions and perceptions of people in other regions and try to find a reasonable explanation for this.

To sum up, I believe internet resources are not the main source of lay knowledge on ecological problems and ecological risks. However, internet resources (along with interviews) allow one to observe the popular response and they contribute to an understanding how the information flows and is consumed by residents of the area.

Temirtau dwellers are either tired of information about ecological problems or do not react to it openly. It is also true that due to cultural, behavioral or historical reasons the residents of Temirtau are passive in the context of more formal discourse and prefer to disseminate and receive knowledge on environment through rumors.

### **Newspapers**

The traditional media (television and newspapers) in my analysis are represented by the newspaper. I have to acknowledge that television is also very important, especially in a post-Soviet city with a strong Russophone urban culture of watching television. Temirtau has its own TV channel and it is only possible to watch it when living in Temirtau and villages nearby. Yet while television broadcasts are less accessible for systematic study, newspapers are a source of knowledge, to which I could gain free access at the library.

As discussed in Chapter 2, I have looked through all available issues of the local newspaper *Temirtauskii rabochii* in the regional library starting from 1980 until 2014. In that chapter, I explained why I have chosen this newspaper for historical purposes. In terms of

contemporary analysis it is important to say that this newspaper is published for Temirtau (although printed in Karaganda) and contains news on Temirtau.

The most important thing about this newspaper is the fact that starting from 2011 until 2014, articles on the environmental protection and industrial contamination in Temirtau decrease in number each year. Whilst the subscription for 2011 contained nineteen articles on environment, nature, health and industrial contamination, the 2012 had seventeen articles, 2013 had twelve articles and 2014 contained seven articles. The authors of the articles through all these years are the same people (fifteen correspondents; five of them published multiple articles). This indicates that the interest in environmental issues decreases either from the side of readers or from the perspective of publisher, or both.

The articles can be divided into two groups. One group of them blames the state for failures in managing the environmental problems. For instance, an article says that the large fines for emissions paid by big factories in Temirtau go to regional (*oblastnoi*) budget or to state budget and in the end this money never goes for benefit of Temirtau in order to improve the ecological situation and to reduce ecological risk.<sup>53</sup> The other group of articles urges residents to take responsibility for environmental protection.

The steel mill is often represented as an enterprise whose main task is to care for environment by investment into purification equipment<sup>54</sup> and by financing various events, such as demonstration dedicated to the World Earth Day.<sup>55</sup> The titles of many articles have such phrases as *blue sky, fresh air, clean air* and *pure air*. If newspapers such as *Temirtauskii rabochii* were the only source of lay knowledge on ecological problems and ecological

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<sup>53</sup> Silvanovich, N. 2013. "My to, chem my dyshim." *TR*, August 28.

<sup>54</sup> Silvanovich, N. 2012. "Ékologicheskie proekty v deistvii." *TR*, June 6.

<sup>55</sup> Abduova, M. 2012. "Ékologiya glazami detei." *TR*, April 25.

industrial risk, a reader would get a feeling that there are two Temirtaus. In one of them the air is almost clean and the factories are spending much money in order to protect nature and people's health. The other Temirtau has 928 enterprises with around 300,000 tons of air contaminants per year,<sup>56</sup> where adult residents suffer from early body aging and young residents suffer from delayed development.<sup>57</sup>

To sum up, the newspapers present different kinds of information on ecological risks and efforts to improve the situation. However, one might believe that many articles are written to find a justification for the steel mill to continue their work in spite of the pollution. Moreover, the newspaper shifts responsibility to residents themselves and there is a decline of interest to environmental topics in general.

In general, the sources of lay knowledge show that the information on ecological problems and industrial risks for lay residents is not abundant, but does exist. Ecological education is not given a top priority in the educational system. However, if a person is interested in ecological issues, he/she can find enough information to get a certain degree of expertise. Meanwhile, the residents of Temirtau, presumably after the time of declining trust in the 1990s, have elaborated their strategies how to cope with environmental risk and many of them exhibit a lack of interest or psychological strategies of suppression and even alienation. I will describe these strategies in the next chapter.

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<sup>56</sup> Shcherbakova, K. 2012. "Spasite prirodu!" *TR*, October 3.

<sup>57</sup> Kulakova, E. 2012. "V Temirtau zhit' opasno?" *TR*, September 19.

## Chapter 5

### Perceptions of environmental risk

In this chapter I will discuss the question of how citizens themselves evaluate or estimate ecological risks in Temirtau, what they feel about them, and what strategies they use in order to cope with them.

This situation in Temirtau is different from the other places, where scholars conducted their research so far. Semipalatinsk (Stawkowski 2016, Purvis-Roberts et al. 2007) and Chernobyl (Petryna 2002) present cases in which ecological disasters happened some time ago and where people now struggle with the consequences and try to elaborate survival strategies. Zonabend (1993) conducted research in La Hague in France and described daily life experiences of residents who use strategy of negation of danger and “speaking nuclear” as a way to cope with the “nuclear everyday”.

Some scholarly literature on perceptions of health risk opposes the lay knowledge to expert or scientists’ knowledge and discusses the overestimation of risk in lay notions. Kathleen Purvis-Roberts, Cynthia Werner and Irene Frank commented that in Semipalatinsk in East Kazakhstan the lay persons have higher perceptions of risk of hazards and radiation than physicians (2007). However, the physicians have a higher perception of risk than scientists who work on issues related to the former nuclear test site.

The ecological situation in Temirtau is different. The industrial contamination caused by the steel mill is ongoing, stable or worsening in its damaging impact, whilst the situations of natural and anthropogenic disaster, such as in Fukushima in Japan, Chernobyl in Ukraine and Bhopal in India (Fortun 2001) are catastrophic at the beginning and recede later on. The population of Semipalatinsk also suffered from long damaging effects on people’s health.

However, the nuclear testing is not conducted anymore. Therefore, the population has to deal with the consequences of a catastrophe, whose gravity will over time eventually diminish. Differently from the above-mentioned settings, in Temirtau the popular evaluation of ecological risk is not a matter of overestimation. This is possibly also connected to the circumstance that, unlike settings like Fukushima or Chernobyl, the industrial contamination in Temirtau, although acknowledged and discussed among experts, gives no privileges or possibilities of benefits to residents. Therefore, there is no incentive to overestimate one's exposure to environmental threat, as this only makes it more difficult to cope with one's situation psychologically.

However, as I argued in Chapter 2, Temirtau residents were exposed to a sort of disaster during the early 1990s, in the sense of a general shift from holding a *strong* form of trust toward the state — i.e., a state that provides the best conditions and fights against the negative consequences of industrial contamination, to a *weak* trust in expertise and state institutions. Therefore, the coping strategies of Temirtau residents are to some extent the response to a trust breakdown, to ambivalence of role of ecological experts and to exclusion of population from the decision making process (as described in Chapter 3).

Hansen et al. discuss the issue of *optimistic bias* in the field of health education (2003). The evaluation of risk with optimistic bias is the opposite phenomenon of overestimation. The people perceive the risk with optimistic bias when they think that their own health is not at risk in the same way as the more vulnerable population. When a person assumes not being at risk because of a better health or of better socio-economic conditions, they are actually underestimating risk. Hansen et al. mention as well that an optimistic bias can be an obstacle in risk communication, if people do not respond to expert advice and do not

“identify the full range of public concerns” (2003, 114). Many among Temirtau residents perceive ecological risk with a certain degree of optimistic bias, thinking that they are not exposed to environmental risk because they have some sort of physical or socio-economic *immunity* to it.

Pidgeon et al. discussed also cognitive and social biases that affect how risk information is processed and how it can lead to an overestimation or underestimation of the likelihood of particular threatening outcomes (2003).

### **Coping strategies of Temirtau residents**

None of my respondents was unaware of the environmental problems in Temirtau, but they use different coping strategies and some of them show different levels of psychological distancing from ecological problems. These coping strategies of Temirtau residents are the following (this is based not only on the views of my respondents but also on the basis of my direct observation during my work as research assistant and analyzing internet resources such as social networks): shifting responsibility, denying risk, a heroic-patriotic attitude, adapting to risk/getting *immune*, minimizing risk, domesticating risk, neglecting risk, and *canonization* of the risk. These are not clear-cut, distinct alternatives, and most of the strategies are intertwined.

Apart from ecologists, who although regarded in popular discourse as experts, belong to the category of residents of the city as well, only two women from my sample were not only aware of environmental risks, but were also concerned and worried about them and probably tend to overestimate them. They are Lena, a city dweller with five children and a secondary-level education, and Venera, who has worked at the factory for a long time and thinks that all the residents of Temirtau are under environmental threat for being “ordinary”

people. These two respondents shift responsibility to the foreign owner, for both of them he was to blame for the pollution and contamination. The way in which they cope with risk is by hoping for a change in the steel mill's owner. "People have put their health at risk and hope to get attention. Children are the future citizens of the state. The state must control the foreign owners," says Lena. The female factory worker I mentioned in the introductory section, although she was not among my respondents, also tends to overestimate risks by saying that workers absorb radiation and their body glow in a dark room. Therefore, there is group of Temirtau residents, who acknowledge the ecological risk, evaluate it as high, tend to overestimate it, and hope for radical changes.

Two other coping strategies consist in risk underestimation or optimistic bias. These coping strategies involve denying risk and sometimes adopting a heroic-patriotic attitude to it. This group of strategies strives to demonstrate the absence of any possibility for people to influence their exposure to environmental risk. First of all, there is an opinion that there is no risk in Temirtau at all, it is only the panic made by newspapers or the bad economic situation that makes people feel bad about everything. "There is now the situation of social strain (*sotsial'naia napriazhënnost'*), which can cause overestimation [of the risk]". This is the opinion of Ermek, a young respondent, who now works in town but had worked some years at the factory as a contract worker. He denies the risk and perceives it with a certain degree of optimistic bias.

Svetlana, an older female teacher from my sample who works in town, says: "It is the statistical data, spread by media (*mussirovalas' v presse*)." She, together with Nazira, who worked at the factory for many years, are taking a stance of heroism or patriotism by accepting their share of environmental risk. "The motherland (*rodina*) is the place where

you have worked and lived most time of your life. You get adjusted to this atmosphere and to this air.” “Why do such cities exist? It is because the people are not afraid to work and to live here.” In these sentences it becomes visible how a heroic-patriotic attitude is a strategy salient to old working class, who decided to regard the ecological risk in Temirtau as their act of bravery or heroic deed.

The next group of coping strategies deals with adaptation to risk (minimizing, getting immune and domesticating). First, some respondents assume that environmental risk in Temirtau is not greater than elsewhere, and thereby think in terms of minimizing risk. This strategy is very salient for factory workers. “To be healthy is not possible at all (*zdorovym byt' voobshche nevozmozhno*)”, thinks Nikolai, a male factory worker, who is about to retire. “The situation in Balkhash is even worse. There is a smell of acid there, which is worse than here [in Temirtau].” These are the words of Venera, an elderly female factory worker. As mentioned, some respondents use not only one strategy but several of them. For instance, Venera during my interview was switching from overestimation and blaming the foreign owner to the ideas that Temirtau is not the worst place in comparison to other places with similar ecological risks.

I assume that the denial or minimizing of risk is closely related to the ideas that people have of what ecological risk amounts to, as I described in Chapter 3. For some of my respondents, ecological risk means literally “death” or “threat of death.” That is why many of them are underestimating the risk in Temirtau, because they compare the ecological situation in Temirtau to disasters such Chernobyl, Hiroshima or the “radiation mushroom” of a nuclear explosion.



Among my respondents, optimistic bias or, more appropriately for the case of Temirtau, thinking of themselves as being used to or being immune to environmental risk in different degrees was the most common coping strategy. “A person gets used to everything. This is how people function (*Chelovek privykaet ko vsemu. Chelovek tak ustroen*).” These words belong to Nazira, a representative of the old working class. Her daughter Madina, who left Temirtau many years ago, comments on her health condition in Temirtau after working in Western Kazakhstan, where she felt bad: “It is probably because of my immunity that [the contamination in Temirtau] did not influence me that much”.

A strategy for domesticating risk, or the way of thinking the presence of risk, of accepting it as a part of daily life consists in turning risk, for instance, into a tool of weather forecasting. “My mother can predict the weather when she looks at the smoke direction. She understands from where the wind is blowing, from West or from East, so she can say if the day will be cold or warm,” says Marina, the young female contract worker. Her coping strategy shows the highest degree of psychological distancing. Probably due to a poor education and low social status, she believes also that the contamination is coming from nowhere or *canonizes* the risk. “The level of mercury in Nura river is growing and nobody knows from where (*nikto ne znaet otkuda*)”. This is an example of not drawing inference and self-alienation from the risk and from the consequences, because if it is canonized, one cannot do anything else apart from just accepting it.

The analysis of the actions of my respondents showed that, apart from elaborating coping strategies, most of them are neglecting ecological risk. They told me about fascinating fishing (although fish could be without scales) and about swimming and leisure time at the Samarkand Lake (although they say that it was built specially for the steel production

purposes and factory pours discharged water into it). Furthermore, when I tried to discuss articles about high rates of lead and dioxin in the sand for playgrounds, which were published in all the newspapers of Temirtau, seven of my respondents did not know about it and did not get interested either.

Almost all respondents try to establish distance from ecological expertise and assume that people can evaluate the ecological risk and ecological danger based on their own perceptions (visually, by smelling or by temperature). All elderly factory workers think that a lay person's evaluation would be more accurate than all official data, warnings or suggestions given by experts. In these people's opinion, this happens because "official data tends always to underreport (*zanizheny*)."

This is the only evident trend in social patterning or rather occupational peculiarity of lay perceptions of risk. The workers who have long experience of work at the steel mill come to believe that people can do better by feeling rather than believing in official data, because the credibility of the official data is always in doubt. However, this can be also due to the Soviet heritage because the elderly workers come from the time when information was either not abundant or was put in doubt some decades later when Glasnost and Perestroika revealed the mismatches and incongruity of the information available in Soviet Union. For these reasons, people tried to use their own perceptions to make forecasts and to evaluate risk.

Thus, I argue that residents of Temirtau engage in psychological distancing, using a variety of strategies for coping with environmental risk, based generally on (a) the notion of being excluded from decision making process, (b) unwillingness to discuss ecological problems, (c) weak trust in ecological expertise, and (d) neglect of the health dangers. As according to

Hansen et al.'s argument, I note that an optimistic bias disturbs risk communication (2003).

The lay population does not have access to and does not follow the expert advice and knowledge and does not communicate their problems and public concerns to experts and officials.

To sum up, the lay population in Temirtau has elaborated different coping strategies following the changes in public trust in early 1990s. Once public trust in expertise in Temirtau broke down, the lay population adapted in different ways. The old working class drew upon Soviet legacy and adjusted to ecological risk by adopting a heroic attitude. The younger generation developed a pattern of ignoring ecological problems and approached ecological risk with an optimistic bias. As a result, risk communication failed and the ecological problems of the city were not resolved.

The experience of ecological risk perception and coping in Temirtau has features that differ from other cases in the literature, as I have argued. This analysis, meanwhile, has the potential to offer conclusions that may be adapted to many similar post-Soviet industrial monotowns in Russia, Kazakhstan and other former Soviet Union republics, such as Balkhash, Togliatti, and Cheliabinsk. In addition, my study can help to understand societal change in post-socialist industrial societies in an era of transition to capitalism, or to "risk society" in Ulrich Beck's terms.

## **Conclusion**

My MA thesis is based on qualitative interviews with residents of Temirtau. I sought to analyze the range of different perceptions of ecological risk in Temirtau and I soon discovered that these perceptions are not bound to a certain social group or to a certain

place. For this reason, I did not focus on a particular social group and instead tried to diversify the range of opinions by taking a variegated sample, including respondents from different social, ethnic, educational and age groups. Based on my analysis of interviews and observation data, I found that for many decades already Temirtau residents elaborated different strategies for perceiving and coping with industrial environmental risks. These various coping strategies are rooted in the diverse social and historical background of the respondents.

I combined anthropological methods of interviewing with the method of content analysis of newspaper articles and presented ways in which newspaper analysis can be made fruitful for the study of societal change and public discourse change. In order to understand the background of coping strategies, I conducted a qualitative and quantitative analysis of articles from the newspaper *Temirtauskii rabochii* (1980-2015). This analysis has shaped my core argument. I have argued that the need for developing strategies for Temirtau residents was based upon a shift in public trust. Public discourse on environmental issues changed in the late 1980s leading to a rethinking of the available ecological knowledge and ecological expertise among residents and experts. Over time, Temirtau residents shifted their attitudes and perceptions of the way in which the state has handled environmental issues. I have described a shift from the strong trust that was characteristic of the late Soviet period regarding the state's expertise and care about citizens' concerns, to a situation of public uncertainty in which the knowledge of ecological problems, industrial risks and solutions provided by state and related agencies has increasingly been subjected to doubts and questions. This shift from strong trust to weak trust, which both now and in the past has been based on a weak knowledge of environmental risks and problems, forced people to adapt and to elaborate their own ways of coping with environmental and health risks. Today

residents of Temirtau continue to see ecological experts ambivalently and continue to be excluded from the decision making process which would address the environmental problems of the city. The strategies that residents of Temirtau use to cope with environmental risks are often based on the psychological effort to shield themselves from a situation of perceived helplessness and to cope with their feelings of anxiety about a worsening environmental and economic situation.

The respondents in my sample have various previous experiences rooted in Soviet times or in the early post-Soviet period. It might well be that the situation could change with a shift of generations. I think the younger population (who do not have memory of the Soviet experience in Temirtau and the implicit model character of a Soviet industrial city that Temirtau to some extent represents) could develop alternative strategies of coping with risk and perhaps adopt a more proactive approach to addressing Temirtau's environmental issues. The city is also changing with a changing ethnic composition, and that could result in changes that are not yet evident in the data I have analyzed. The Kazakh speaking component of the city is growing, raising questions about whether newly arrived Kazakh speaking residents hold different perceptions of environmental risk, as well as specific strategies of coping with it.

By studying lay knowledge and lay perceptions of ecological risk in Temirtau I have sought to contribute to the theoretical debates on the opposition between expert and lay knowledge by adding to our understanding of the way in which these types of knowledge are hierarchically related. I have shown that between the two poles of experts and lay persons, there can be a range of intermediate levels of knowledge, e.g., experts with limited functions, such as the *ékologi* in Temirtau. Moreover, the employees of state services are

not proper experts as well because people do not perceive them being experts. Being an expert means having authority, which state experts are prevented from having because they are too disconnected from people, and the only way they come close is when lay knowledge tends to reinforce their authority.

As for Temirtau, I hope that the strategies of denying and neglecting ecological risks will change and will be overcome by ecological consciousness and popular participation. Shortly before finishing this master's thesis, an event occurred in Temirtau, which inspires such hope. It was widely reported that a freelance artist from Almaty painted the wall of a five-story residential building in Temirtau.<sup>58</sup> He made a caricature of Henri Matisse's "La Danse", showing office employees dancing around a factory chimney spewing black smoke in the air. The event drew the attention of the public and a negative reaction from the authorities. The residents of Temirtau mostly responded by expressing appreciation for the beautiful painting, largely agreeing that the artist made the wall look different from the shabby, unpainted walls of the surrounding buildings.

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<sup>58</sup> Radio Azattyk. 2016. "Avtora èkologicheskogo graffiti v Temirtau ishchet politsiia." Accessed April 21, 2015. <http://rus.azattyq.org/a/pasha-kas-graffiti-temirtau/27688411.html>; TTK TV Channel. 2016. "Neizvestnyi khudozhnik raskrasil torets odnoi iz mnogoètazhek." Accessed April 21, 2016. <http://etemirtau.kz/news/city/3946-neizvestnyy-hudozhnik-raskrasil-torec-odnoy-iz-mnogoetazhek.html>.

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