PRZESZŁOŚĆ DEMOGRAFICZNA POLSKI

POLAND'S DEMOGRAPHIC PAST

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Spis treści / Table of Contents

STUDIA I MATERIAŁY / STUDIES AND MATERIALS

NARZĘDZIA I METODY / TOOLS AND METHODS

Przeszłość Demograficzna Polski – Poland's Demographic Past 46 (2024): 7–36
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"Paradise Lost": The Depopulation of the Jews of Narol in 1648

„Raj utracony". Depopulacja Żydów narolskich w 1648 roku

Abstract

This article attempts to revise previous findings, largely speculative, regarding the extent and, above all, the composition of the demographic losses of the Jewish population during the Khmelnytsky Uprising. In general, it can be said that research difficulties are due to the lack of an adequate source base or to the use of an overly simplified method of calculation. The unique result of the archival research is a Hebrew manuscript recording the murder of the Jewish population of the town of Narol by Bohdan Khmelnytsky's army; a version, with translation, is given in the appendix. The demographic analysis of this center, based on a fairly well-preserved collection of documentary and narrative sources, gives an insight into its pre-war population potential, its ethnic structure, then the course of events in the tragic year of 1648 and their consequences in terms of personal

Abstrakt

W artykule podjęto próbę rewizji dotychczasowych ustaleń, w większości przypuszczeń odnośnie do wielkości, a przede wszystkim kompozycji strat demograficznych ludności żydowskiej w czasie powstania Chmielnickiego. Najogólniej powiedzieć można, że trudności badawcze wynikają z braku odpowiedniej bazy źródłowej albo też przyjęcia nazbyt uproszczonego sposobu kalkulacji. Wyjątkowym rezultatem kwerendy archiwalnej jest rękopis hebrajski rejestrujący zamordowaną ludność mojżeszową miasta Narola przez wojska Bohdana Chmielnickiego; jego edycję, opatrzoną przekładem, publikujemy w aneksie. Przeprowadzona analiza demograficzna wskazanego ośrodka, przy wykorzystaniu dość dobrze zachowanego zasobu źródeł aktowych i narracyjnych, daje wgląd w jego przedwojenny potencjał populacyjny, strukturę etniczną,

losses, with particular emphasis on the Jewish population. It also considers the issues of deportation into slavery (yasir) and, as a result of the threat of war, migration and emigration.

Keywords

Narol, population, Jews, Khmelnytsky Uprising

następnie przebieg zajść w tragicznym 1648 roku i ich następstwa w postaci strat osobowych ze szczególnym uwzględnieniem żywiołu żydowskiego. Zwrócono przy tym uwagę na zagadnienia deportacji (jasyr) oraz – spowodowanych zagrożeniem wojennym – migracji i emigracji.

Słowa kluczowe

Narol, populacja, Żydzi, powstanie Chmielnickiego

Introduction

The outbreak of the Khmelnytsky Uprising is widely regarded as a turning point in the history of both the Polish-Lithuanian Commonwealth and the Jewish people. The painful experiences of that time have left a permanent scar on the collective consciousness of Polish Jews. Until that time, their population in Poland had experienced almost uninterrupted rapid growth in Poland; by the end of the 16th century, they were the largest Jewish community in Europe. By the mid-17th century, Zygmunt Sułowski estimated that some 500,000 Jews lived in the Polish-Lithuanian state.[1] Maurycy Horn's findings show that on the eve of the largest Cossack uprising 54,000 Jews lived in Red Ruthenia, the majority in towns (45,000). In the Belz voivodeship alone there were about 10,000 Jews, 8,300 of whom lived in 30 of the total of 33 towns.[2] One of these was Florianów, a town on the Tanew River that at that time belonged to the Łaszcz family. The small town gained notoriety due to the tragic events that took place in the fall of 1648 at the hands of the Cossack and Tatar armies. From then on, the name Florianów was used interchangeably with Narol, which until then had only been identified with the half-century older neighboring village.

This article examines the fate of Narol's Jewish community from a demographic perspective. First, it will attempt to determine its pre-war ethnic composition and population potential, and then to describe the course of wartime events in the town. The main focus of the paper will be an in-depth analysis of the population losses, using the comparative, retrogressive method as well as direct and indirect inferences

[1] Zygmunt Sułowski, "Liczebność Żydów na ziemiach polskich," in *Naród – Kościół – kultura. Szkice z historii Polski*, ed. Adam Chruszczewski (Wydawnictwo Katolickiego Uniwersytetu Lubelskiego, 1986), 239.

[2] Maurycy Horn, *Żydzi na Rusi Czerwonej w XVI i pierwszej połowie XVII w. Działalność gospodarcza na tle rozwoju demograficznego* (PWN, 1975), 70, 75.

from the source material. The article will reveal the extent and structure of population changes in Narol after the attack of the Cossack and Tatar hordes in 1648, and will also serve as a stimulus to revise some of the existing historiographical views on the wartime consequences of the Khmelnytsky Uprising, both in terms of the extent of losses and their distribution in terms of those murdered, those taken into slavery, and those displaced.

The paper is based on a variety of archival records drawn from the Treasury. Of note are the registers for the hearth tax, well known to researchers. This tax, approved by the Sejm in 1629, also covered the Jewish population.[3] The collection was based on tax declarations (abjurats), which have been preserved to the present day. They were drawn up in the commune and later confirmed by their representatives under oath before the municipal court in Belz or Grabowiec (juraments). Interesting statistical data is contained in the poll tax tariffs; the first one from 1662, which we used, is particularly reliable. We should not forget the narrative accounts provided by Jewish chroniclers, especially Nathan Hannover of Ostrog (*Abyss of Despair*, Venice, 1653) and Meir ben Samuel of Shcherbreshin (*Suffering of the Times*, Kraków, 1650). It must be remembered, of course, that their accounts also contain a literary and religious layer that heightens the martyrological dimension of the injustices suffered, while at the same time idealizing the Jews and portraying them almost exclusively as innocent victims.[4]

A Hebrew manuscript found in the collection of the National Library and previously unknown to researchers, a prayer of supplication with a list of Narol Jews murdered by Khmelnytsky's army, is of exceptional research value. It is an original document, written in ink on a single sheet of handmade paper; its actual content in Hebrew is on the recto (modern folio 48), while the verso is inscribed with annotations and later additions in Yiddish and a title in Polish, written in pencil: *Spis* Żydów *pomordowanych przez Kozaków w r. 1648 w Narolu* [List of Jews Murdered by the Cossacks in 1648 in Narol]. The Cymelium is part of a collection of copies and originals from the 17th to the 19th centuries compiled by the Lviv historian and archivist Aleksander Czołowski (1865–1944)–file 6958. They have been kept in the National Library since 1947, when they were purchased, together with many other manuscripts, from his daughter Stanisława Karczewska.[5]

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[3] Horn, *Żydzi*, 65.

[4] For more on this topic, see, e.g., Adam Teller, "Jewish Literary Responses to the Events of 1648–1649 and the Creation of a Polish-Jewish Consciousness," in *Culture Front Representing Jews in Eastern Europe*, ed. Benjamin Nathans and Gabriella Safran (University of Pennsylvania Press, 2008), 31–32, 34.

[5] Małgorzata Kośka, "Dokumenty klasztorne w zbiorach kolekcjonerów lwowskich – Wiktora Baworowskiego i Aleksandra Czołowskiego," *Miscellanea Historico-Archivistica* 27 (2020): 341.

Given the importance of this document, we present it in its original form, translated and photocopied, in the Appendix.

Despite repeated references in the academic literature to the topic of demographic losses of the Jewish population during the Khmelnytsky Uprising, the state of research on this issue is far from satisfactory.[6] To date, we do not have any authoritative findings regarding Narol or other towns in the Belz voivodeship.[7] It should be noted that, as a rule, the aspect of the wartime structure of population losses, taking into account the different categories of people, i.e., killed, captured and temporarily or permanently transferred to other centers, including abroad, was ignored. Shaul Stampfer attempted to determine these proportions and estimated that the number of Jews murdered in the territories of the Crown (excluding Red Ruthenia and the Lublin and Podlasie voivodeships) at the time of the Khmelnytsky Uprising was at least 18,000, while the number of Jews taken prisoner was 3,000, i.e., a total of half the local population. According to him, about 8,000 Jews survived by fleeing.[8] While not disputing Stampfer's calculations, Adam Teller estimated that during the series of wars in the mid-17th century, the Tatars abducted a total of about 6,000 Jewish prisoners from the territory of the Commonwealth, while the number of those internally displaced amounted to about 15,000. A further number fled abroad, mostly to the German Empire (10,000).[9]

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[6] Best able to explore this issue was a monograph on Pinsk, based on a considerable number of various types of sources. See Mordechai Nadav, *The Jews of Pinsk, 1506 to 1880*, ed. Mark Mirksy and Moshe Rosman (Stanford University Press, 2008), 59–192.

[7] In the case of Narol, most has been written about the Jewish community by Henryk Gmiterek: "Narol w okresie Rzeczypospolitej szlacheckiej (1585–1772)," *Rocznik Lubaczowski* 5 (1994): 17–36; Henryk Gmiterek, "Żydzi narolscy w dobie przedrozbiorowej," *Prace Historyczno-Archiwalne* 30 (2018): 15–26; Henryk Gmiterek and Zygmunt Kubrak, *Narol przez wieki. Dzieje miasta i okolic* (VEGA Studio Adv. Tomasz Müller, 2021), while we learn a little more about the incidents in the city during the first period of the Cossack uprising from the work of Eugeniusz Janas, "Narol na mapie polskich dziejów wojskowych XVII wieku," *Rocznik Lubaczowski* 5 (1994): 37–45; and Dariusz Wojnarski, "Losy miast ziemi lubaczowskiej na trasie pochodu wojsk Bohdana Chmielnickiego w roku 1648," *Rocznik Lubaczowski* 6 (1996): 32–41.

[8] Shaul Stampfer, "What Actually Happened to the Jews of Ukraine in 1648?," *Jewish History* 17, no. 2 (2003): 217–18, 221. See also Shaul Stampfer, "Jewish Population Losses in the Course of the Khmelnytsky Uprising," *Judaica Ukrainica* 4 (2015): 36–52.

[9] Adam Teller, *Rescue the Surviving Souls: The Great Jewish Refugee Crisis of the 17th Century* (Princeton University Press, 2020), 8–12, 17, 38–39, 96, 98, 110–11, 307–08. We know from Adam Teller's research that Jews captured by the Tatars were mainly taken to the slave market in Istanbul. Thanks to the organization of a large international fundraising campaign by the Jewish community, it was possible to buy back most of the captives (but only, we should emphasize, those who reached the Ottoman Empire). Jews had experience in these matters, as the problem of yasir (the basis of the Crimean Khanate's material existence) had long affected Eastern European territories, although during the wars of the mid-17th century the scale of the phenomenon was unprecedented. In the meantime, the Jews living in Crimea since the 11th century had been engaged in the lucrative business of trading in "live goods."

The Jewish chroniclers of the past gave very different figures, completely unrealistic and exaggerated, with a clear emotional, even martyrdom-like, slant. Despite the hyperbole, their accounts contain a wealth of information that allows us to trace the fate of the Jewish population at that time.[10]

At this point, it is worth mentioning the reasons for the Zaporizhians' aversion, or sometimes outright hostility, toward the Jews. First of all, following the Union of Lublin, in the southeastern territories of the Polish-Lithuanian Commonwealth, aristocratic estates were established, largely served by the Jewish population (as factories, landlords, and collectors), which the local peasants perceived as an immigrant factor, equally responsible with the nobility for feudal oppression and impoverishment. These feelings were reinforced by the religious aspect; the culturally different population of the Jewish faith was often treated with contempt and abhorred by local parishioners and the Orthodox and Ruthenian Uniate clergy.[11] The latter, along with the Roman Catholic clergy and their followers, including the Polonized nobility, did not enjoy the sympathy of the majority of Orthodox clergy and their Ruthenian faithful, who opposed the Union of Brest. This public sentiment was brilliantly exploited by the once indifferent Cossacks, who from the 1620s acted as guardians of the Orthodox Church, and on their insurgent banners added the defense of the "ancient Greek religion" to the slogans of higher military conscription or expanding Zaporizhia's autonomy.

At the outbreak of the Cossack uprising, the Polish Jews living in the southeastern voivodeships (Braclaw, Chernihiv, and Kyiv) were the first to be exposed. Under the terms of Khmelnytsky's military alliance with Khan İslâm III Giray, concluded in March 1648, the territories from Zaporizhia to Bila Tzerkva were considered Cossack territory, where the Cossacks were not supposed to engage in plundering.[12] However, in the rest of the territory, as Nathan Hannover noted, there was a spoils-sharing clause that gave the Tatars people and cattle, while the Cossacks kept all the valuables.[13] After the first joint victories over the Polish army

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[10] E.g., Nathan Hannover, Meir ben Samuel and Shabattai HaKohen. See Saul Borovoy, ed., *Evrejskie hroniki XVII stoletiâ. Èpoha „hmel'ničiny"* [Саул Боровой, ред. Еврейские хроники *XVII* столетия. Эпоха *„*хмельничины*"*] (Gesharim, 1997).

[11] Tomasz Ciesielski, "The Jews in Times of War and the Social and Political Riots in the Southeast of the Polish-Lithuanian Commonwealth in the 17th and 18th Centuries," *Biuletyn Polskiej Myśli Historycznej* 9 (2004), 270–71. According to Stampfer, "What Actually Happened," 215, Ukrainian voivodeships along with Podolia and Volhynia were inhabited by some 40,000 Jews.

[12] Leszek Podhorodecki, *Chanat Krymski i jego stosunki z Polską w XV–XVIII w.* (Książka i Wiedza, 1987), 168.

[13] Nathan Hannover, "Jawein Mecula tj. Bagno Głębokie," in *Sprawy i rzeczy ukraińskie. Materiały do dziejów Kozaczyzny i Hajdamaczyzny*, pub. F. Rawita-Gawroński (Drukarnia Jakubowskiego i Sp., 1914), 21. In accordance with these agreements, in June 1648, after the capture of Tulchin, the Cossacks handed over the captive Jews to Khan İslâm III Giray. See Hadży Mehmed Senai

in the spring of 1648, it was agreed that the Tatars could only take Jews and Poles into slavery in the territory of the Crown, while prisoners captured in Lithuania would be given to the Cossacks.[14]

The above guidelines were not fully respected, including by the undisciplined Black Cossacks recruited from among the local peasantry. They regarded Khmelnytsky's rebellion as an excellent opportunity to take revenge on the nobility (regardless of their origin) and the Jews, whom they blamed for their impoverishment. The latter, in the sparsely urbanized Zadnieper, usually functioned as part of at most two-family communities in rural areas, where they rented inns from nobles. In fear of their lives, many Jews and local aristocrats took refuge in towns west of the Dnieper River at the very beginning of the Cossack uprising.[15] Soon, as the Uprising progressed, it became clear that right-bank Ukraine was not safe either, and Nemyriv and Tulchyn, captured by the insurgents in the early summer of 1648, became symbols of massacres of the Jewish population. The refugee crisis worsened as Jews, terrified by the cruelty of the Black Cossacks, fled in panic, sometimes abandoning all their belongings.[16] The Jewish documentarian Nathan Hannover, a native of in Volhynia, is perhaps the most accurate in recounting the exodus of his fellow Jews prior to the approaching military onslaught. He recounts that they went "to fortified places, to the holy communes of Bar, Kamianets-Podilskyi, to Brody, to the capital city of Lviv, to Buchach, to Yazlovets, to Zhovkva, Narol, Przemyśl, Belz, the Sokal monastery and Zamość. Some fled to Wallachia, and very many took refuge as far as towns located beyond the Vistula River."[17]

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z Krymu, *Historia chana Islam Gereja III*, ed., comp., transl. Zygmunt Abrahamowicz (PWN, 1971), 109, 174; Teller, *Rescue*, 101.

[14] Pantelejmon Petrovič Gudzenko et al., *Vossoedinenie Ukrainy s Rossiej. Dokumenty i materialy v treh tomah*, vol. 2, *1648–1651 gody* [Пантелеймон Петрович Гудзенко и др., Воссоединение Украины *с* Россией. Документы *и* материалы *в* трех томах, т. 2, *1648–1651 gody*] (USSR Academy of Sciences, 1953), 24.

[15] Teller, *Rescue*, 27–28, 31–32. In fact, the Cossack Hetman approved of the activities of the Black Cossacks, because thanks to them the uprising was gaining strength, although he did not officially admit it. See Przemysław Kozłowski, *Działalność polityczno-dyplomatyczna Bohdana Chmielnickiego* (PhD diss., Adam Mickiewicz University, 2014), 279.

[16] Teller, 33–34.

[17] Hannover, "Jawein," 46. There were two main directions of Jewish refugee migration within the Commonwealth: to the West (Lesser Poland, Greater Poland) and to the North (Grand Duchy of Lithuania). The southern direction mentioned by Hannover was officially forbidden by the Volhynian Hospodar in early October 1648. See Teller, *Rescue*, 40, 111.

The Pre-war Demographic Potential of the Town

From Henryk Gmiterek's research we learn that the first mentions of Jews in Narol come from the period of the town's foundation. Its establishment under the Magdeburg Law was laid down by Sigismund III Vasa's charter of October 2, 1592. On January 1, 1596, at the request of the town's delegates, chosen from "both Christians and Jews," the founder of the city, Florian Łaszcz, issued a charter exempting from taxation some Jewish property (a synagogue, a hospital and 6 houses) already in operation or planned for construction.[18] There may have been a wooden synagogue at that time, but the brick structure was built by the Jews of Narol and the nearby town of Lipsko, founded in 1613. On April 30, 1616, Jerzy Łaszcz gave his consent to this investment and to the joint use of the synagogue by the Jews of both towns.[19] We also know that at that time the Jewish population of the town of Narol had a Kahal self-government. Its community grew dynamically and by 1630 it occupied 40 houses (out of a total of 238 listed in the tax register), the most of any town in the Belz voivodeship.[20] Using the conversion rate of 12 persons per Jewish home and 6 persons per family, we calculate, following Maurice Horn,[21] that there were 480 Jews living in Narol at that time, representing 28% of the total population of the town, estimated at 1,736 people (including the 66 of the landowners' enclave and the *jurydyka*—an autonomous private enclave within the town).[22] This was a high rate in comparison with the median

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[18] Henryk Gmiterek (comp.), *Przywileje lokacyjne Florianowa (Narola) z lat 1592–1596* (Urząd Miasta i Gminy Narol, 2021), 5, 13, 15. The "schoolmaster" mentioned in the founding document may be identified as the Shamash, or usher at the synagogue, referred to here as the "school." See Alina Cała, Hanna Węgrzynek, and Gabriela Zalewska, *Historia i kultura Żydów polskich. Słownik* (Wydawnictwo Szkolne i Pedagogiczne, 2000), 330.

[19] Gmiterek, "Żydzi," 21.

[20] Horn, *Żydzi*, 60, 69; Maurycy Horn, *Powinności wojenne Żydów w Rzeczypospolitej w XVI i XVII wieku* (PWN, 1978), 84; Центральний Державний Історичний Архів України, Львів [Central′nij Deržavnij Ìstoričnij Arhìv Ukraïni, L′vìv] (hereafter: CDIAUL), Księgi grodzkie bełskie (hereafter: KgBeł), Relacje, vol. 215, p. 639; vol. 595, p. 1129, 1229.

[21] Horn, *Żydzi*, 70.

[22] In determining the number of houses, a ratio of 6 inhabitants per Christian house was used, which is reasonable for relatively small towns with wooden buildings. See Piotr Guzowski and Radoslaw Poniat, "Przeliczniki demograficzne w szacunkach zaludnienia miast w Królestwie Polskim w drugiej połowie XVI wieku," *Przeszłość Demograficzna Polski – Poland's Demographic Past* 37, no. 2 (2015): 90. Compare Gmiterek and Kubrak, *Narol*, 55, found (assuming a conversion rate of 6 people per Christian house and 9 per Jewish house with a 10% reestimate for the non-tax-paying population) a comparable number of city residents (1,703 people). In turn, Maurycy Horn, "Zaludnienie województwa bełskiego w 1630 roku," *Roczniki Dziejów Społecznych i Gospodarczych* 21 (1959), 90, estimated the town's population at 1,820, including 632 Jews living in 19 large and 21 small houses). At that time there were probably at least two noble manors in the town, because after the death of Florian Łaszcz (d. 1609) his sons, Florian and Jerzy, acted as co-owners of Florianów for several years. Jerzy became the sole owner in 1630. See Gmiterek and Kubrak, *Narol*, 36–38.

of all the towns in the Belz voivodeship at that time, which stood at 14.6%.[23] Only a few years later, in 1635, the Jewish population of Narol had surged to about 43% of the town's population. At that time, 120 Jewish families were concentrated in 60 houses (720 people), while the Christian community was smaller than before, with 150 households or about 900 people (plus the allodial and jurydyka area, with about 66 people).[24] According to a later inventory (1664), in which all the owners or co-owners of landed property and bailiffs were listed by name, the town was inhabited almost exclusively by Catholics, in addition to Jews. Ruthenians lived in the outskirts of the town together with Poles.[25] Material evidence of their presence were churches—within the town there is a Roman Catholic affiliated church and a Ruthenian Uniate church functioning within urban and rural parish structures.[26]

The increase in the Jewish population observed in the 1630s was mainly the result of immigration, while the decrease in the Christian population was partly the result of the economic expansion of the Jews and partly a consequence of recent events, for, as town officials testified at the Grabowiec court in 1635, "due to the disagreeable air, as well as the great hardship caused by the soldiers, eight and twenty houses were deserted."[27] In the following years the demographic potential of the Jewish community stabilized and prospered. The same could not be said for their property, as in 1641 soldiers stationed in the town for a short time by

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As established by Andrzej Wyczański, *Wieś polskiego Odrodzenia* (Książka i Wiedza, 1969), 94, the staff of a manor house consisted of 7 people on average. Narol's census of 1662 (see note 71), reporting on 5 manors in the town, defines a similar ratio (7.6 people). On the other hand, the average number of nobles residing in a manor was 2.8 people. Taking into account children and seniors we can deduce, similarly to Cezary Kuklo's finding, that there were on average about 13 people living in one manor house and its buildings, or a total of 26 people in 1630. See Cezary Kuklo, "Wielkość i struktura gospodarstwa domowego w Polsce wczesnonowożytnej. Próba charakterystyki," in *Cała historia to dzieje ludzi… Studia z historii społecznej ofiarowane profesorowi Andrzejowi Wyczańskiemu w 80-tą rocznicę urodzin i 55-lecie pracy naukowej*, ed. Cezary Kuklo (Wydawnictwo Uniwersytetu w Białymstoku, 2004), 169. Another 40 people populated the clerical jurisdictions (see note 26).

[23] Horn, *Żydzi*, 74.

[24] Archiwum Państwowe w Lublinie (hereafter: APL), Księgi grodzkie grabowieckie (hereafter: KgGr), Relacje, vol. 129, p. 81.

[25] Henryk Gmiterek, "Inwentarz dóbr narolskich z 1664 roku," *Rocznik Lubaczowski* 6 (1996): 53–55. At the time, only one person of Ruthenian descent (Matvi Rusin) resided in the city as a bailiff.

[26] The Roman Catholic parish in Florianów was founded by Jerzy Łaszcz in 1617, while the first mention of a Uniate church dates from 1619. See Gmiterek, Kubrak, *Narol*, 36, 39, 57. The church was served by a vicar, probably also a lay reader (or presbyter), and several assistants with domestic servants (vitricus [church warden], cantor, cook); Several people (perhaps even as many as in a Roman Catholic temple) functioned within the church premises administered by a parish priest. Roughly, globally assuming that each person in the church service had a family, about 40 people.

[27] APL, KgGr, Relacje, vol. 81, p. 1031; Relacje, vol. 129, p. 81.

the Sandomierz ensign Adam Hieronim Kazanowski broke the windows of Jewish houses.[28] The sworn testimony of the mayor Sebastian Poniat and the alderman Wojciech Sokolowski before the court in Belz in 1643 states that "there are no more than sixty Jewish houses in the town of Florianów."[29] At that time, of the towns in Belz voivodeship, only Tomaszów (60 houses) and Dubienka (64 houses) still had a similarly large Jewish population.[30]

The Course of the War

The year 1648 marked the beginning of a series of wars that severely strained the foundations of the Republic and disrupted the relatively stable condition of many urban centers where the Jewish population was concentrated. Bohdan Khmelnytsky's forces, having won a number of victories (Zhovte Vody, May 16, Korsun, May 26, Pyliavtsi, September 23) over the Polish army, headed primarily toward Lviv. After unsuccessfully besieging the city and holding it for ransom, the 100,000-strong Cossack and Tatar army headed north, in the direction of Zamość. The main route passed through Kulykiv, Zhovkva, Maheriv, Potelych and Rava, which was the last urban settlement the Cossacks and Tatars invaded before entering Florianów.[31] Located on the Tanew River, the town was not equipped with modern fortifications, although access to it was extremely difficult. It was surrounded by earthen ramparts reinforced with wooden fencing and a moat connected to a lake that flanked the city from the south.[32] Even before the invaders reached the Florianów area, a large number of refugees, mainly nobles and Jews, had arrived. The Jewish chronicler Nathan Hannover exaggerated the number to tens of thousands, while Meir ben Samuel of Shcherbreshin, in his chronicle *Suffering of the Times*, similarly exaggerated the number to 10,000 Jews.[33]

Hearing that a powerful army was approaching Florianów, the Jews wanted to flee, but "the head of the town did not allow it, saying: 'We will stand against the enemy and fight them, as other fortresses have done.'"[34] Certainly, the head's appeal was addressed primarily to the local Jews, since they were under his jurisdiction,

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[28] CDIAUL, KgBeł, Relacje, vol. 227, fol. 492v–93.

[29] CDIAUL, KgBeł, Relacje, vol. 229, pp. 531–32. Similarly it can also be assumed, that in 1643 the number of Christian houses had not changed compared to 1635.

[30] Horn, *Żydzi*, 69.

[31] Wojnarski, "Losy," 33–34.

[32] Janusz Bogdanowski, "Fortyfikacje ziemne na terenie powiatu lubaczowskiego," *Rocznik Ziemi Lubaczowskiej* 2 (1971), 20.

[33] Hannover, "Jawein," 51; Borovoy, *Evrejskie hroniki*, 170.

[34] Hannover, "Jawein," 51–52.

while some of the refugees, including some from Narol and even Jerzy Łaszcz's wife and children, had fled before the arrival of the enemy troops.[35] It should be mentioned, as Maurice Horn noted, that the Jewish population of the towns was obliged to take an active part in their defense, even having their own weapons and ammunition for the occasion.[36]

The first regular Cossack and Tatar troops reached Florianów in the last week of October. They were joined by local peasant groups numbering about two thousand men.[37] According to the *Suffering of the Times* chronicle, the city was surrounded and the outskirts torched at the very start. Despite significant material losses, this operation cleared the advance fire field and actually helped the defenders successfully repel the initial attacks.[38]

The main Cossack and Tatar forces arrived on October 31, 1648, and began a full-scale siege.[39] German traveler Ulrich Werdum reported that the city was surrounded by an encircling ring: from the north, Cossacks, and from the south, Tatars.[40] On the first day of the siege, the main thrust of the attack focused on cannon fire. Jerzy Łaszcz and a group of defenders barricaded themselves in a wooden arsenal on a small island in the lake. In the evening, when the artillery fire ceased, the Cossacks attacked the narrow embankment that was the only passage to the town between the reservoir and the marshes. A fierce battle ensued, as we learn from Ludwik Zieliński's account, based on oral tradition: "Łaszcz watched every move of the enemy, stood on the embankment and bravely repulsed the attackers. Several hundred Cossacks and a dozen noblemen were killed here: the battle was murderous, the Cossacks won a hundred to one; Łaszcz's defenses held out; finally, the dark night put an end to further bloodshed."[41]

Discouraged by their failure, the troops retreated from the ramparts and set up camp on the hill where the Łosiów Palace stands today.[42] The next morning, Khmelnytsky sent a messenger to the town with an offer to pay a ransom in exchange for lifting the siege. However, Łaszcz, ignoring the pleas of the Jews and townspeople, rejected the ultimatum.[43] In fact, he probably took the ataman's offer as a sign of his

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[35] Ludwik Zieliński, "Narol – Lubycza – Rawa – Żółkiew," *Lwowianin* 2 (1842), 48.

[36] Horn, *Powinności wojenne*, 59, 81.

[37] Janas, "Narol," 39–40.

[38] Borovoy, *Evrejskie hroniki*, 171.

[39] Information from the chronicle leads to this conclusion "Bagno Głębokie". See Hannover, "Jawein," 52, gave the exact date of the capture of the city, stating that the siege lasted 3 days.

[40] Ulryk Werdum, *Dziennik podróży 1670–1672. Dziennik wyprawy polowej 1671*, comp. Dariusz Milewski (Muzeum Pałac w Wilanowie, 2012), 90. Meir ben Samuel described the situation similarly—compare Borovoy, *Evrejskie hroniki*, 171.

[41] Zieliński, "Narol," 48–49.

[42] Janas, "Narol," 39.

[43] Hannover, "Jawein," 52; Zieliński, "Narol," 48; Werdum, *Dziennik podróży*, 90.

weakness, for in response he rushed out of the castle, "drove the Cossacks from the hilltop, slaughtered a fair number of them, picked up a few flags, and promptly took refuge in his wooden arsenal."[44] The fruitless negotiations and audacious raids by the then-head of Narol only strengthened the resolve of the besiegers, and reinforcements were brought to the town.[45] Ludwik Zieliński reported that the Cossacks were aided in their conquest by the treachery of the local miller, Michał. Bribed by Khmelnytsky on the night of November 1–2, "after getting the Polish sentry at the mill drunk, he raised the sluice gate and let the water out."[46] This allowed the army to infiltrate the city under cover of darkness and attack the arsenal team on the island.[47] According to the aforementioned Ulric Verdum, who lived in Narol in the 1770s, the town was captured in an attack by the Tatars, who crossed the lake at night and invaded the town.[48] This almost fantastical version is perhaps the most likely, given that the Tatars were well versed in the art of crossing water, and their horses were very good swimmers.[49] Zieliński vividly describes these events: "Łaszcz roused himself from sleep, put on his armor, quickly prepared the assembled guards, fought against the overwhelming force in the middle of the night, lost several hundred brave men, and by daylight escaped through blood-stained chambers to the tower, from where, after being shot several times from a falconet, covered in wounds and drenched in blood, he fell half dead into the hands of Khmelnytsky."[50] He was then tortured, as Hannover also reported, stating that the aggressors "murdered the head of the town, who was called Łaszcz, skinned him alive and put him through the most horrific ordeal."[51] Meanwhile, the arsenal was blown up under mysterious circumstances, killing several hundred Cossacks.[52] Khmelnytsky probably saw this as a diversionary tactic that added fuel to the proverbial fire. Of the two Jewish chroniclers cited who were alive at the time, Meir of Szczebreshin gave the most detailed description of the events. From his account we learn that some Jews took refuge in the synagogue, but its doors were broken down by the invaders, who then slaughtered the people gathered in the central area (the bima), which was used for reading liturgical texts, and finally set fire to the building.

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[44] Zieliński, "Narol," 49.

[45] Zieliński, "Narol," 48; Hannover, "Jawein," 52.

[46] Zieliński, "Narol," 49. The date given is consistent with the account of the "Bagno Głębokie," chronicle which reported the occupation of the city on November 2, 1648. See Hannover, "Jawein," 52.

[47] Zieliński, "Narol," 49.

[48] Werdum, *Dziennik podróży*, 90.

[49] Leszek Podhorodecki, *Tatarzy* (Książka i Wiedza, 1971), 268; Podhorodecki, *Chanat Krymski*, 57.

[50] Zieliński, "Narol," 49.

[51] Hannover, "Jawein," 52.

[52] Zieliński, "Narol," 49.

Other Jews generally tried in vain to hide in the bushes by the river, and many drowned or died of hypothermia. The Tatars took boys, girls, and young women into slavery.[53] A preserved record of an episcopal visitation from 1649 reports that the local church, filled to the brim with refugees, was ransacked and stained with the blood of the murdered.[54]

Particularly noteworthy is an excerpt from Hannover's account, which he himself singled out, of the story of one of the surviving women, "who managed to stay alive by lying down among the corpses; in this way several hundred women and children and some men were saved."[55] The condition of the survivors was dire, and many could not afford to bury their loved ones. As the two Jewish chroniclers and the bishop visitor quoted above unanimously note, for some time the sight of human bodies lying in the streets in the autumn mud, torn apart by animals and birds, was striking.[56]

The Post-war Demographic Condition of the Town

On November 2, 1648, after the departure of Khmelnytsky's army, the city was in a state of disaster. On June 28, 1649, the representatives of the town, Tobiasz Wilanowski and Stanisław Nieciecki, appealed to the court in Belz: "Our town of Florianów has been devastated by the enemy of the Crown; thirty-seven houses have been burned to the ground, and the remaining people have been hacked to pieces, while others have been taken captive; a few have died, and there are only three of us householders left."[57] It should be emphasized that the jurament—to which we have no objection, as to the subsequent ones of 1650—only records the male owners of the houses, while it omits the other tenants, and we know from Hannover (but also indirectly from the Hebrew document in the appendix) that women and children predominated among the survivors. The court testimony of 1649 was supplemented in early 1650 by two affidavits of townspeople, in which they described the condition of the houses after the return of some of the inhabitants. At the Belz court session on February 23, Stanislaw Partecki, a representative of Narol, testified that only 26 houses were inhabited in the town, including two estates

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[53] Borovoy, *Evrejskie hroniki*, 171. These incidents are described in a similar, if vaguer, manner, by Hannover: "Jawein," 52.

[54] Biblioteka Polskiej Akademii Nauk—Polskiej Akademii Umiejętności w Krakowie (hereafter: BPAU-PANKr), ms. 8470, pp. 274–75.

[55] Hannover, "Jawein," 52.

[56] Hannover, "Jawein," 52; Borovoy, *Evrejskie hroniki*, 171; BPAU-PANKr, ms. 8470, p. 275.

[57] CDIAUL, KgBeł, Relacje, vol. 596, p. 18. Compare Gmiterek and Kubrak, *Narol*, 49, 55, who erroneously reported that as a result of the Cossack and Tatar attack on the city in 1648, only 37 houses survived (in fact, that is how many houses were burned down!).

of the nobility (the estate of Catherine of Jaszczowski, widow of Jerzy Łaszcz, was not included).[58] Two days later, the same Partecki, who later became the mayor of the town, reported that of the above number of resettled houses, most were located along the streets, while nine were in the market square, and of these three properties belonged to Jews and six to the Christian population. At the same time he added that after the attack of the Cossacks "the number of resettled people is gradually increasing."[59] They were mostly Poles, predominantly refugees, since Christian captives from middle-class or rural backgrounds—as we know from scattered source information on the Tatar invasions—were generally not ransomed and did not return to their homes. Jews, in particular, were not eager to return to the city, as the collected tax records attest. They were the most mobile ethnic group, so it is not surprising that under the conditions of the continuing turmoil of the war, they usually made the decision to resettle in other, sometimes very distant urban centers.

Adam Teller found that most of the Jews captured during the wars of the mid-17th century and who ended up in the Istanbul slave market were ransomed (4,000-6,000). On the other hand, he notes that the total number of abductees is unknown because some died in transit, as is the unknown number of those who did not return because they converted to Islam.[60] Prisoners of war from Narol took more than a month to travel the approximately 1,100 kilometers to Crimea. They traveled about 25 to 30 kilometers a day with other prisoners, pulling carts filled with plunder and driving stolen cattle and horses. Restrained by ropes, they generally followed on foot, and all of this took place in conditions of late autumn cold and rain.[61]

A number of them, most likely the impoverished residents whose homes were burned down, decided to leave Narol permanently and relocate to safer places, mainly within the Republic, but also abroad. The most famous war refugee from Narol was Rabbi Moshe Kohen,[62] who wrote in his work, *Bakasha* (Pleading):

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[58] CDIAUL, KgBeł, Relacje, vol. 595, pp. 1441–42. It can be assumed that a total of about 15 people lived in three noble houses.

[59] CDIAUL, KgBeł, Relacje, vol. 596, p. 32.

[60] Teller, *Rescue*, 190, 308.

[61] The remarks of Andrzej Gliwa and Karol Łopatecki lead to such conclusions (Andrzej Gliwa, "Niewola brańców tatarskich z ziem południowo-wschodnich Rzeczypospolitej w XVII wieku: doświadczenie przemowy i jego konsekwencje w postaci stresu pourazowego," in *W niewoli. Doświadczenie jenieckie i jego konteksty na przestrzeni dziejów*, ed. Marcin Jarząbek, Michał Stachura and Piotr Szlanta (Towarzystwo Wydawnicze Historia Iagellonica, 2019), 145; Karol Łopatecki, "Jednostki odległości i szybkość podróżowania w drugiej połowie XVI stulecia w świetle traktatu Blaisea de Vigenère," *Przegląd Historyczny* 112, no. 3 [2021]: 547).

[62] Teller, *Rescue*, 8–9, 215–16.

Polsko, Ty, która byłaś rajem,	*Poland, you who were a paradise,*
Pierwszą byłaś dla nauki i wiedzy,	*You were first in learning and knowledge,*
Od dni, w których odpadł od Judy Efraim,	*From the days when Ephraim went astray from Judah,*
Ty, któraś słynęła wiedzą umiejętną,	*You, who were known for your expert knowledge,*
Teraz jesteś wygnaną i samotną wdową,	*Now you are an exiled and lonely widow,*
Opuszczoną jesteś przez swe własne syny.[63]	*Abandoned by your own sons.*

Hearth tax registers compiled in 1654 and 1661 record a total of only 28 occupied houses.[64] Two juraments drawn up between 1660 and 1661, although we have reasonable doubts about their completeness, shed light on the national and religious structure of the city, indicating 20 occupied houses belonging to Christians and only five to the Jewish community.[65] Using the method of demographic estimation adopted earlier, namely the multipliers for the conversion of property, one could conclude that—excluding the clergy, nobility and their servants—only 180 people lived in Narol at that time, 60 of them Jews. In the reality of the wartime decade of the 1650s, such mechanical calculations should be treated with considerable suspicion, as many families were scattered and taxes were often not collected from such families. It should also be noted that under the conditions of wartime poverty, the practice of underestimating the tax base in the juraments submitted for the collection of tolls repeatedly intensified. It seems that this rule did not apply to the Jewish population due to the growth of anti-Semitic sentiment on a wave of accusations of so-called ritual murders and collaboration with the Swedes; for this reason, efforts were made to enforce state taxes from them in a restrictive way.[66] Finally, an important aspect, as indicated by the conclusions of our demographic study of Krasnystaw, may have been the growth of allodial lands

[63] Henryk Markiewicz (comp.), *Żydzi w Polsce. Antologia literacka* (Universitas, 1997), 201.

[64] CDIAUL, KgBeł, Relacje, vol. 249, p. 259; Archiwum Główne Akt Dawnych w Warszawie (hereafter: AGAD), Archiwum Skarbu Koronnego (hereafter: ASK), vol. 65, fol. 740.

[65] CDIAUL, KgBeł, Relacje, vol. 249, p. 1060; vol. 595, p. 1693. When considered with the earlier hearth tax list of 1653 (which was probably compiled on the basis of the juraments filed since 1652 but not preserved) and the later hearth tax list of 1662, we indirectly conclude that Jews occupied about 5 town properties in 1652–1662. See notes 64, 71.

[66] These were mostly unauthorized accusations, although there were reports of the collaboration of some Jews, among others by Karol Koscielniak, "Wpływ wojen północnych XVII i XVIII w. na postawy i relacje mieszkańców Poznania różnych wyznań," *Studia Historyczne* 62/1 (2019), 56; Zenon Guldon, "Straty ludności żydowskiej w Koronie w latach potopu," in *Rzeczpospolita w latachpotopu*, ed. Jadwiga Muszyńska and Jacek Wijaczka (WSP im. Jana Kochanowskiego, 1996), 299–300. The issue of so-called ritual murders was covered in detail by Zenon Guldon and Jacek Wijaczka in *Procesy o mordy rytualne w Polsce w XVI–XVIII w.* (DCF, 1995).

(which were not subject to the hearth tax) observed at the time, followed by an increase in their population by the impoverished Christian population.[67] In the case of Narol it should be noted that after the tragic death of Jerzy Łaszcz there was an expansion of the allodium by his successors. However, the sacral property shrank; the Ruthenian Uniate Church, burned down during the November firestorm of 1648, was not rebuilt.[68]

An important source of verification, which indirectly points to the inaccuracy of the calculations based on the hearth tax of that time and the juraments filed in connection with it, is the protest filed with the court in Belz on October 16, 1653, with a sworn list of damages from the troop stations of the royal rittmaster, Sebastian Kochanowski. The troops under his command—as testified by the local councilors led by the mayor Błażej Taborowicz—had been stationed three times in the previous year (January 6, June 29, September 23–24) in the town of Narol and the adjacent village, causing considerable material damage, estimated by the Christian population at 500 zlotys. An entry in the book lists a total of 36 Christian owners of property in the town who were affected (Poles and one Rusyn, 6 of them women). Unfortunately, the Jews were not included, although in a separate register of October 6, 1653, they listed their lost property (food, objects, money), estimated at 61 zloty 25 grosz.[69] First of all, the great disproportion between the amount of material damage suffered by the Christian population (although the town and village of Narol are included) and the Jewish population is striking. At the same time, it is worth noting the significantly higher number of Christian properties (by 15) in relation to the hearth tax and the juraments submitted for its collection. The number of Christian householders indicated by name (using the conversion rate of 6 people per house, and 5 people per house in cases of households without a male owner) gives a total of 210 people, while taking into account the noble lands in the city (3 manor complexes—39 people) and the clerical jurydyka (church complex—20 people) we calculate 269 people.

The general poll tax of 1662 proved to be an effective monitoring tool for verifying the demographic profile of Jews. Passed the previous year by the Warsaw Sejm, it covered all social classes (and thus all residents of the jurisdiction) and was notable for its reliability. According to the tax ordinance, the elderly,

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[67] Dariusz Wojnarski, "Rzemiosło i handel w Krasnymstawie. Między prosperity a kryzysem (połowa XVI–XVII w.)," *Roczniki Dziejów Społecznych i Gospodarczych* 82 (2021), 63.

[68] Gmiterek and Kubrak, *Narol*, 57. A *jurament* dated February 25, 1650, attests to the lack of a priest in the town (CDIAUL, KgBeł, Relacje, vol. 596, p. 32). The bishop's visit in 1649 shows that Roman Catholic church in Narol was devastated and required renovation. Although its parish priest had returned, he conducted church service alone—due to staff shortages—and also in the nearby church in Lipsko (BPAU-PANKr, ms. 8470, p. 275).

[69] CDIAUL, KgBeł, Relacje, vol. 242, fol. 296–98.

small children, and the poor, up to 40–50% of the total population, were excluded.[70] The census of Narol records 222 Christians and 31 Jews, and lists the names of 14 people of noble descent living in five manors, as well as 34 rural journeymen employed in them.[71] Thus, the conclusion is that the total number of inhabitants (after adding the approximately 20 inhabitants of the omitted church complex) was 589 people, among whom there were approximately 62 Jews, who made up about 11% of the town's population.[72] Most likely (despite the objections raised to the use of house counts), the Jewish population occupied only 5 dwellings. The latter figure, which corresponds to the hearth tax, suggests that the tax register of the 1650s was reliable with regard to the collection of this tax for the Jewish population, as already mentioned. On the other hand, the large discrepancy in the case of the Christian population, as already shown by the 1653 census of the Christians concerned, can be explained by the deliberate underestimation of the number of inhabited properties, as well as by the territorial and demographic expansion of residential areas in manorial enclaves, which were excluded from the tax levy. At the same time, we note that between 1653 and 1662 there was a significant increase in the Christian population of Narol. Soon this demographic trend was reversed, as the number of Christian inhabitants did not increase, while the number of Jews, who arrived in large numbers in the 1660s, increased. The Narol estate inventory of 1664 listed 42 Jewish families (i.e., 252 people in 21 houses) and 70 Catholic families (i.e., 420 people in 70 houses) living in the town[73] (plus 85 people from the Church and nobility). Summarized demographic data for the town of Narol in 1630–1664 is shown below (Table 1).

Table 1. Population of Florianów-Narol, 1630–1664

Year	Number of inhabited houses				Number of inhabitants			
	Christian	Jewish	Allods	Total	Christian	Jewish	Allods	Total
1	2	3	4	5	6	7	8	9
1630	198	40	12	250	1,188	480	66	1,734
1635	150	60	12	222	900	720	66	1,686
1643	150	60	12	222	900	720	66	1,686

[70] Cezary Kuklo, *Demografia Rzeczypospolitej przedrozbiorowej* (Wydawnictwo DiG, 2009), 87–88, 360–61.

[71] AGAD, ASK, vol. 72, fol. 203v–204, 232v. In total, 65 people lived in the nobility *jurydyka*, according to the adopted ratio of 13 people per court.

[72] Compare Gmiterek and Kubrak, *Narol*, 55, who determined the total population to be only 278, a consequence of taking into account an overestimation that was too low (10%) in relation to the generally accepted rules of calculation used for the poll tax.

[73] Gmiterek, "Inwentarz," 53–54.

1	2	3	4	5	6	7	8	9
1648/49	45	18	3	66	270	212	15	497
1650	21	3	3	27	126	36	15	177
1652/53	36	5	10	51	210*	62	59	331
1662	74	5	14	93	444	62	85	589
1664	70	21	14	105	420	252	85	755

*5 people per house in cases of households without a male owner (6 households).

Source: own work based on Gmiterek, "Inwentarz," 53–54; BN, ms. 6958, fol. 48; CDIAUL, KgBeł, Relacje, vol. 215, p. 639; vol. 229, pp. 531–32; vol. 242, pp. 296–98; vol. 249, p. 1060; vol. 595, pp. 1129, 1229, 1441–42, 1693; vol. 596, p. 18, 32; APL, KgGr, Relacje, vol. 81, p. 1031; vol. 129, p. 81; AGAD, ASK, vol. 65, fol. 740; vol. 72, fol. 203v–204, 232v.

The analysis shows that in the tragic events of the fall of 1648, 1,355 people lost their lives or were abducted into slavery (and some did not return, especially Poles), moved to other places (both at home and abroad, especially Jews), but also over time (up to 1652) died of wounds and epidemic diseases common at the time—more almost half of whom were Jews (658 people—an estimate, as with the other calculations).

Many more were murdered in Narol, as the local population and refugees sought refuge there. According to Meir ben Samuel, 10,000 Jews were killed, and according to Nathan Hannover, as many as 12,000 Jews were killed.[74] The surviving record of the bishop's visitation in 1649, on the other hand, shows that a total of 18,000 people lost their lives. Among them were five Catholic priests and a monk, while the pastor of the local parish escaped death by fleeing.[75] The scale of this massacre must have been enormous; admittedly, the town of Narol was sprawling and could accommodate many visitors, but the numbers given are undoubtedly deliberately exaggerated.

However, we have no similar objections to the Hebrew document commemorating the murdered Jews of Narol in 1648. This manuscript, probably written shortly after the tragic events, contains a list of the names and surnames of the victims, so that its reliability and completeness are not in doubt.[76] It resembles another equally valuable document, namely a prayer in honor of the Sandomierz Jews who

[74] Hannover, "Jawein," 52; Borovoy, *Evrejskie hroniki*, 171.

[75] BPAU-PANKr, ms. 8470, p. 275.

[76] Biblioteka Narodowa [National Library] (hereafter: BN), ms. 6958, fol. 48–48v. While the Hebrew document does not list women killed, it certainly does not omit them. This is indirectly attested to by an analogous prayer message from 1655, which records the total number of Sandomierz Jews murdered, including women and girls. See note 77.

were murdered in 1655.[77] As Anna Michałowska notes, the creation of such written artifacts was an expression of the survivors' reverence for their fallen relatives and community members. In this way, their deaths were understood as sacrifices that brought the coming of the Messiah closer.[78]

The source text in question lists 85 murdered Jews of Narol, or about 12% of the pre-war population, according to our calculations. They are all men, presumably heads of families. The document bears the signature of Esther, daughter of Magid Mordechai HaLewi; we also have a later addition in the form of the autograph of Yehuda, son of Nachman.[79] This would confirm that at the time of its compilation, presumably shortly after the bloody events, there were no Jewish men in the town of Narol. The absence of women and children from the list of those killed in the massacre suggests a preconceived procedure that the Cossacks sometimes used in other conquered places. In Nemyriv, according to the testimony of a surviving Jewish woman, Buda, first to be murdered were about 150 Jewish villagers; they were ordered to dig a deep ditch, and then massacred.[80] Some people, especially women, were saved in exchange for renouncing their faith and converting to Orthodoxy. Adam Teller believes that the extent of this practice was indeed widespread.[81] Indirectly, we can conclude that the situation was also similar in Narol.

It is most likely that immediately after the departure of the Cossack and Tatar troops almost 500 inhabitants of Narol remained in the town, and here again we can refer to Hannover's account, as he cites several hundred survivors, mostly women and small children (and in this case we cannot accuse him of exaggeration), referring, as already noted, to the account of the surviving Narol townswoman. If we assume that the Cossacks—as in Nemyriv—exterminated all the married men, we can conclude that at the turn of October/November 1648 there were

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[77] Dawid Kandel, "Rzeź Żydów sandomierskich w r. 1655," *Kwartalnik poświęcony badaniu przeszłości Żydów w Polsce* 1, no. 2 (1912/1913): 111–17.

[78] Anna Michałowska, "Elegie żydowskie upamiętniające wydarzenia połowy XVII wieku," *Napis* 7 (2001): 261–62.

[79] BN, ms. 6958, fol. 48.

[80] Teller, *Rescue*, 36, 101, 103; Gliwa, "Niewola brańców," 144. Although elderly people and small children were of no great material value to the Tatars, they were sometimes treated very cruelly. For example, in Zhyvotiv, which was taken on June 6, after prisoners had been taken the remaining population, including Ruthenians, was murdered.

[81] Teller, *Rescue*, 37–38, 57. Some of the Nemyriv Jews escaped death by agreeing to convert to Orthodoxy and take an oath of allegiance to the Cossacks. See Moshe Rosman, *Categorically Jewish, Distinctly Polish: Polish Jewish History Reflected and Refracted* (Liverpool University Press, 2022), 152. The high degree of religious conversion is confirmed by observations of the Jewish community in Pinsk. See Nadav, *Jews of Pinsk*, 151–52. Compare Stampfer, "What Actually Happened," 218, who, in turn, estimated that this was not a common practice and put the number of Jewish converts in Ukraine at about 1,000 people.

85 Jewish families in Narol, i.e., 510 people. This in turn means that the rest of the 35 Jewish families (remember that before the war there were 120), or 210 people, fled from Narol, probably not later than shortly after the Battle of Pyliavtsi. As we know, wealthy people were the first to flee, as they had the most to lose. At the same time, they could afford to pay for the costly forced relocation along with their belongings loaded on carts and, in the case of merchants, also goods for sale.[82] The Christian population, often a mixture of artisans and farmers, had to shoulder the additional burden of transporting their livestock. As with the Jews, it was primarily the wealthiest who fled, for they had the means to survive away from home.

Nathan Hannover was not untruthful when he wrote about the taking of girls, young women and boys into Tatar slavery. In fact, this was typical behavior, confirmed by various source accounts for other cities captured by Khmelnytsky's army.[83] In order to get at least an approximate answer to the number of people abducted, it is necessary to refer to the average age structure of the towns at the time. The results of Irena Gieysztorowa's research suggest that half of Narol's estimated pre-war population were older children, adolescents, and young adults.[84] We conclude that most likely 140 Jews (after deducting young married Jews who were killed, refugees, and people in their prime, seniors, and small children who were not taken into yasir) were captured by the Tatars. Thus, after the departure of Khmelnytsky's army, there may have been 212 surviving female Narol Jews—widows and orphans—in the town. If one were to assume a proportional structure of attrition for Poles (available sources indicate that the margin of error for such comparative identification is not large), there would have been 285 of them left in the town (including allodial properties). All of them traumatized and bereaved, and at the same time robbed, deprived of their livelihood, malnourished and sick, they commonly died, as the above-mentioned *jurament* of June 1649 reported. The extent of the misery was striking, as Hannover mentions that hungry people cannibalized the victims.[85]

Some of the rescued and lucky survivors of the pogrom moved permanently to other places in Poland and even abroad, such as the aforementioned Rabbi Moshe of Narol. Indirectly, we can conclude that Jewish widows and orphans left Narol

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[82] Examples of such behavior are described in e.g., Nadav, *Jews of Pinsk*, 33, 152, 172.

[83] Such a course of action applied, e.g., to the town of Konstantinov, as described in Zenon Guldon and Jacek Wijaczka, "Żydzi a chrześcijanie na Wołyniu w XVI–XVIII wieku," *Nasza Przeszłość* 80 (1993): 231. See also Andrzej Gliwa, "Niewola brańców," 144–45. In 1667, during an attack on a group of refugees near Trembowla, Tatars took 80 people, among them 27 women, 12 men and 41 children, into yasir.

[84] Irena Gieysztorowa, *Wstęp do demografii staropolskiej* (PWN, 1976), 131.

[85] Hannover, "Jawein," 52.

soon after the tragic events and ended up as internally displaced persons, mainly in the community of Przemyśl. Przemyśl was the most supportive community for the affected Narol Jews. Information from Hannover's report on the arrival of Jews from Przemyśl to Narol to bury their fellow Jews[86] leads to this conclusion. The influx of Jewish refugees into the city must have been considerable, since Przemyśl Council, in a resolution dated July 26, 1649, instructed City Hall as follows: "Jews and other transients should not be admitted to the city."[87]

In the 1650s, Narol was fortunate enough to escape another devastating attack by foreign armies and began to slowly recover from its decline. However, due to the constant threat of war, it was not until the 1660s that the Jewish population began to resettle in the town. The long-standing thesis of historians about the rapid reconstitution of the Jewish demographic potential in the territories occupied by the Cossack and Tatar cavalry refers primarily to the towns, from which a larger part of the Jewish population fled in an organized manner, taking their possessions with them or hiding them well. They remembered the time of turmoil of the earlier Cossack uprisings. As a result, as Mordechai Nadav's detailed study of the Jews of Pinsk most clearly confirms, the population and infrastructure loss of the local Jews was small (15 people, 18 houses). These were mainly the city's remaining poor, who could not afford to quickly arrange costly transportation. In the significantly depopulated city, occupied by Cossacks on the march at the end of October 1648, most of those who remained were fellow Ruthenians.[88]

On the other hand, in those places where the material and especially human losses were very high, a quick return to the pre-war state was impossible. It should be emphasized that in the spring and summer there was a chaotic flight from the spreading insurrection in the eastern part of the Crown territory. Along the way, with reports of Khmelnytsky's approaching troops, in an effort to speed up the flight, even the most valuable possessions were abandoned. During this forced migration, the exhausted refugees sought shelter in better-fortified towns.[89]

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[86] Hannover, "Jawein," 52. Solidarity and humanitarian aid among Jews shown to refugees and victims was common at the time. See Teller, *Rescue*, 2, 4, 12.

[87] Antoni Prochaska (comp.), *Lauda wiszeńskie 1648–1673. Akta grodzkie i ziemskie z czasów Rzeczypospolitej Polskiej z archiwum tak zwanego bernardyńskiego we Lwowie*, vol. 21 (Księgarnia Seyfartha i Czajkowskiego, 1911), 57.

[88] Rosman, *Categorically Jewish*, 153–154; Nadav, *Jews of Pinsk*, 148, 150–56, 160–62. By December 1648 some Jews had returned to Pinsk, and in just 18 months, 18 burned Jewish houses had been rebuilt (the synagogue and 78 houses remained intact) and trade had resumed. The case of Dubno (also occupied by Cossacks in October 1648) is less well documented, although it also indicates a planned flight of Jews followed by a fairly rapid recovery of economic potential. For further details see Rosman, *Categorically Jewish*, 155–66.

[89] Teller, *Rescue*, 33–34.

When they succumbed to the onslaught of the insurgents, they were either killed or taken prisoner like the locals.

It seems that as late as the fall of 1648, despite the fact that Khmelnytsky's army was advancing rapidly westward, many inhabitants of the Tanev River region lived in the belief that the Cossacks would not reach the Belz voivodeship, as they had in previous armed uprisings. It is true that Cossacks occasionally ventured into the area, but they mainly attacked towns that they could conquer on the march, while Narol was not an easy target and had never been occupied by foreign troops until 1648.[90] Of course, not everyone shared this optimism, and those who had more foresight (such as Rabbi Moshe or the priest of the local Roman Catholic parish)—apparently with enough time to spare—moved to areas farther from the scene of hostilities. As the onslaught of the Cossacks and Tatars approached and more and more refugees arrived in the city, while Jerzy Łaszcz remained in his position to defend it, the situation became a stalemate and escape became impossible.

The foregoing analysis calls into question the previous findings and, even more so, the assumptions of researchers, Shaul Stampfer in particular, which suggested that in the structure of the demographic loss of the Jews, the largest part was accounted for by those who were murdered. In the course of our research, we were able to determine that the largest group consisted of those who were taken into yasir, and refugees, a significant number of whom did not return (were resettled elsewhere, died during their forced march to Crimea, or stayed there as Islamic converts, or, but this was mainly true of Christians, were not bought out of yasir). To a certain extent, they correspond to the position of Natalya Yakovenko, who believes that the Cossacks' aversion to Jews did not translate into an exceptional number of murdered, since comparable losses were also recorded among other ethnic groups.[91] However, this is an oversimplification, since during the Khmelnytsky Uprising such behavior took place mainly during independent raids by Tatars or Black Cossacks. In the operations of the regular, combined Cossack and Tatar armies, it was mainly Poles and Jews who were killed and taken into slavery, while the Russian population sympathized with the insurgents to the greatest extent and not infrequently went over to their side. This was the case, for example, in nearby Tomaszów, which Khmelnytsky entered after taking Narol.[92] Admittedly,

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[90] As late as October 27, military approaches sent from below Zamość provided reassuring information that only local peasant bands were active in the Belz voivodeship, when in fact regular Tatar and Cossack forces were already there. See Janas, "Narol," 40.

[91] Natalia Yakovenko, "The Events of 1648–1649: Contemporary Reports and the Problem of Verification," *Jewish History* 17 (2003): 167.

[92] Russian merchants from Putyvl, who were mentioned by name, upon their return from Konstantinovsk, reported—as mentioned by the local voivode on June 9, 1648—that the Cossack hetman had given orders to murder Poles and Jews after seizing urban and rural settlements. See Gudzenko, *Vossoedinenie*, 37–39. For more on the occupation of Tomaszów, see Dariusz Wojnarski,

in Ukraine some poorer Jews found their way into the ranks of the insurgents, but this was a relatively small group of financially disposed converts.[93] Most of the Jews, as in Narol, united to defend the attacked towns.

An analysis of the demographic losses of the Narol center during the Khmelnytsky Uprising showed that the large depopulation of Jews observed in some of the occupied towns translated into a long-term regression of that community, which in the case of Narol lasted more than a decade. This is consistent with Stampfer's findings, although his assertion that there were relatively few such urban settlements in Red Ruthenia requires further study. Undoubtedly, this was the norm in Ukraine, where Jewish communities did not have time to evacuate as planned and therefore suffered the most.[94] The case of Narol has shown that meticulous archival research, including access to unique sources, supported by an analysis of the academic literature, provides an opportunity for an in-depth analysis of the issue of demographic losses in towns that were captured after a battle and in which the local Jewish population remained in the vast majority at the time of their enemy's occupation. The case of Narol has made it possible to shed light on the national structure of demographic losses and, more importantly, to bring closer the relationship between the number of Jews murdered, those taken into slavery and those who were displaced.

"Straty materialno-demograficzne miast Ordynacji Zamojskiej w następstwie napadu wojsk Bohdana Chmielnickiego w 1648 r.," *Roczniki Wydziału Nauk Prawnych i Ekonomicznych KUL* 4, no. 2 (2008): 120.

[93] Horn, *Powinności wojenne*, 88–90.

[94] Stampfer, "Jewish Population," 37–39.

Appendix

Prayer in remembrance of the murdered Jews in Narol in 1648

אל מלא רחמים שוכן במרומים המצא מנוחה נכונה על כנפי השכינה במעלות גדולים וטהורים כזוהר הרקיע

מזהירים את נשמתם: את מ"ר דן ב"ר מאיר הכהן ובנו מ"ר מרדכי ומ"ר ישראל איסר הכהן, ואת מ"ר זאב בינמין ב"ר שמריל הכהן, ואת החבר ר' יוסף בן ר' מרדכי הכהן, ואת מ"ר יעקב בן ר' ישראל הכהן, ואת מ"ר יעקב ב"ר אהרן הכהן ובנו מ"ר מאיר הכהן, ואת מ"ר שמואל ב"מ ר' ארון הכהן, ואת מ"ר זאב ב"מ יעקב הכהן, ואת מ"ר מרדכי ב"מ ארון הכהן, ואת החבר ר' ארון בן החבר ר' אברהם הכהן, ואת החבור ר' מאיר בן החבר ר' ברוך הכהן, ואת מ"ר אליהו ב"מ ר' חיים הכהן, ואת מ"ר ראובן ב"ר אלכסאנד הלוי ובנו מ"ר משה הלוי, ואת מ"ר יוסף ב"מ ר ארון הלוי, ואת מ"ר שלומה בן החבר ר' פלטיאל הלוי, ואת מ"ר יעקב במ"ר אשר הלוי ובנו מ"ר צבי ואת מ"ר דוד הלוי, ואת החבר ר' ישראל אליעזר ב"ר יוסף הלוי ובנו החבר ר' יהודא הלוי, ואת מ"ר חיים במ"ר דוד הלוי, ואת החבר מ"ר מאיר ב"מ ר' יהודה הלוי, ואת החבר ר' זאב ב"מ ר יעקב הלוי, ואת מ"ר דוד יהודה ב"ר יוסף הלוי, ואת מ"ר מאיר במ"ר יעקב הלוי, ואת מ"ר אליעזר במ"ר אברהם ובנו מ"ר יוסף, ואת החבר ר' יצחק בן החבור ר' עזרא ובנו החבר ר' ישראל, ואת מ"ר ניסן ב"מ ר' יקתיאל ובנו מ"ר אהרן, ואת מ"ר יוסף יוזפ במ"ר לוי, ואת מ"ר שמרין במ"ר יהודא, ואת מ"ר יוסף במ"ר יעקב גבריאל ובנו החבר ר' בנימין, ואת מ"ר אשר ענדל ב"מ ר' יואל, ואת מ"ר יוסף בן החבר ר' בנימין, ואת מ"ר אליקים בן החבר ר' דוד, ואת מ"ר דוד במ"ר מרדכי, ואת מ"ר מנחם בן מ"מ ר' ארון ובנו מ"ר אשר, ואת מ"ר שלומה בן מ"ר אלכסנדר, ואת מ"ר אברהם צבי במ"ר ארון וחותן מ"ר קלונמס במ"ר צבי, ואת מ"ר צבי בן החבר ר' ישראל ובנו מ"ר קלונמס והחבר ר' דוד, ואת מ"ר זאב ב"מ ר' מנחם ובנו מ"ר מאיר, ואת מ"ר אירע במ"ר מאיר, ואת החבר ישראל בן ירוחם, ואת מ"ר אברהם עביר במ"ר צבי, ואת מ"ר יקתיאל [... .....], ואת מ"ר אהרן במ"ר אליהו, ואת מ"ר משה שלומה ב"מ שאול, ואת מ"ר גד במ"ר שמואל, ואת מ"ר זאב בן החבר ר' שמואל, ואת מ"ר אברהם בן ר' קלונמס, ואת מ"ר מרדכי במ"ר דוד, ואת מ"ר אביגדר בן החבר ר' ארון, ואת מ"ר יוסף במ"ר אליעזר, ואת החבר ר' ישראל בן ר' יוסף, ואת מ"ר יואל במ"ר מנחם, ואת מ"ר מנחם במ"ר יואל, ואת מ"ר זאב במ"ר יואל, ואת החבר ר' ארון בן ר' אברהם, ואת החבר שמואל בן החבר ר' דוד, ואת החבר ר' ישראל דוב בן ר' יצחק, ואת החבר ר' אברהם ב"מ זאב, ואת מ"ר אברהם ב"מ אביגדר, ואת מ"ר בנימין זאב בן מ"ר יהודא, ואת מ"ר ישכר במ"ר אליעזר, ואת מ"ר שלם במ"ר שמואל, ואת מ"ר יעקב חיים במ"ר בנימין זאב, ואת מ"ר ארון ב"ר אשר, ואת החבר ר' אהרן ב"ר שמואל, ואת מ"ר יוסף אביגדר במ"ר שלם, ואת מ"ר אליעזר במ"ר שמואל, ואת מ"ר אברהם יצחק במ"ר משה, ואת מ"ר אפרים במ"ר בנימין זאב, ואת מ"ר צבי במ"ר יהודא, ואת מ"ר יואל במ"ר זאב שהלכה לעלמים. אסתר בת מ"מ מרדכי הלוי. [*נ"כ*] ואת מ"ר יהודה ב"ר נחמן.

Translation

God full of mercy, who dwells on high, grant these souls undisturbed rest under the wings of Your Presence, on levels of holiness and purity, shining like the splendor of the vault of heaven: Dan, son of Meir HaKohen and his sons Mordechai and Israel Iser HaKohen, Zeew Binyamin, son of Shimril HaKohen, chaber Yosef, son of Mordechai HaKohen, Yaakov, son of Israel HaKohen, Yaakov, son of Aharon HaKohen and his son, Meir HaKohen, Shmuel, son of Aron HaKohen, Zeev, son of Yaakov HaKohen, Mordechai, son of Aron HaKohen, chaber Aron, son of chaber Avraham HaKohen, chaber Meir, son of chaber Baruch HaKohen, Eliahu, son of Chaim HaKohen, Reuwen, son of Alexander HaLevi and his son, Moshe HaLevi, Yosef, son of Aron HaLevi, Shlomo, son of chaber Paltiel HaLevi, Yaakov, son of Asher HaLevi and his sons Tzvi and David HaLevi, chaber Israel Eliezer, son of Yosef HaLevi, and his son, chaber Yehuda HaLevi, Chaim, son of Davida HaLewi, chaber Meir, son of Yehuda HeLevi, chaber Zeev, son of Yaakov HaLevi, David Yehuda, son of Yosef HaLevi, Meir, son of Yaakov HaLevi, Eliezer, son of Avraham and his son Yosef, chaber Yitzhak, son of chaber Ezra and his son, chaber Israel, Nisan, son of Yekutiel and his son Aharon, Yosef Jozep, son of Levi, Shimrin, son of Yehuda, Yosef, son of Yaakov Gavriel and his son, chaber Binyamin, Asher Endel, son of Joel, Yosef, son of chaber Binyamin, Eliakim, son of chaber David, David, son of Mordechai, Menachem, son of Aron the magician and his son Asher, Shlomo, son of Alexander, Avraham Tzvi, son of Aron and his son-in-law Calonimus, son of Tzvi, Tzvi, son of Israel and his sons Calonimus and chaber David, Zeev, son of Menachem and his son Meir, Ira, son of Meir, chaber Israel, son of Jerucham, Avraham Abir, son of Tzvi, Yekutiel [...], Aharon, son of Eliah, Moshe Shlomo, son of Shaul, Gad, son of Shmuel, Zeev, son of chaber Shmuel, Avraham, son of Calonimus, Mordecai, son of David, Avigdor, son of chaber Aron, Yosef, son of Eliezer, chaber Israel, son of Yosef, Joel son of Menachem, Menachem son of Joel, Zeev son of Joel, Hawer Aron son of Avraham, chaber Shmuel, son of chaber David, chaber Israel Dow, son of Yitzhak, chaber Avraham, son of Zeev, chaber Avraham, son of Avigdor, Binyamin Zeev, son of Yehuda, Issachar, son of Eliezer, Shalom, son of Shmuel, Yaakov Chaim, son of Binyamin Zeev, Aron, son of Asher, chaber Aharon, son of Shmuel, Yosef Avigdor, son of Shalom, Eliezer, son of Shmuel, Avraham Yitzhak, son of Moshe, Ephram, son of Binyamin Zeev, Tsvi, son of Jehuda, Joel son of Zeev, who have gone into eternity.

Esther, daughter of the magician Mordechai HaLevi

[Addendum] Yehuda, son of Nachman

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"Paradise Lost": The Depopulation of the Jews of Narol in 1648

Summary

The aim of the article was to estimate the demographic losses of the Jewish community of Narol in 1648 and, at the same time, to verify popular opinions regarding the extent of the depopulation of this ethnic group during the Bohdan Khmelnytsky Uprising. The urban centers of the Polish-Lithuanian Commonwealth, which administratively belonged to the Belz Voivodeship and were founded in the early modern period, developed dynamically until the middle of the 17th century. Narol became one of the largest Jewish communities. It gained notoriety as a result of the tragic war events of the mid-17th century. Jewish chroniclers of the time, with their customary exaggeration - although they also took into account the refugees who came to Narol—reported the extent of the pogrom against their people. Researchers, on the other hand, although rightly questioning these exaggerated figures, often used statistics in a very arbitrary way. The analysis of various sources, including a Hebrew document unknown in previous historical writings, allowed us to determine the course of the tragic events in the town and their demographic consequences. At the same time, the generally accepted structure of wartime population losses, which puts the dead in the foreground, was questioned. It was found that of the more than 1,680 inhabitants of Narol (including 720 Jews—43%), almost 500 people remained, including 212 Jews, most of whom were women and children. 85 Jews died directly at the hands of the Cossacks, 140 were taken into slavery (yasir), while some of them regained their freedom. A group of 210 people were Jewish refugees, most of whom, like the prisoners bought from the Tatars, chose to be resettled in other locations in the country or even abroad. In the following years, unlike a part of the Christian population, they did not want to return to the town, mainly because of the continuing threat of war. On the contrary, the Jewish widows and orphans who remained in the town most likely moved to Przemyśl, although many of them also died as a result of diseases and epidemics. As a result, the Jewish population shrank to 62 individuals in 1652, which was 19% of the total population of Narol (331). It was not until the 1660s, when the wartime atmosphere had subsided, that many Jews began to arrive in the town.

„Raj utracony". Depopulacja Żydów narolskich w 1648 roku

Streszczenie

Założeniem artykułu było oszacowanie strat demograficznych społeczności żydowskiej Narola w roku 1648, a przy tym weryfikacja obiegowych opinii co do zakresu depopulacji tej grupy etnicznej w czasie powstania Bohdana Chmielnickiego. Ośrodki miejskie Rzeczypospolitej Obojga Narodów, administracyjnie należące do województwa bełskiego, a powstałe w okresie wczesnonowożytnym, do połowy XVII w. dynamicznie się rozwijały. Narol stał się wówczas jednym z największych skupisk żydowskich. Zyskał ponurą sławę w rezultacie tragicznych wydarzeń wojennych połowy XVII w. Ówcześni kronikarze żydowscy z charakterystyczną dla siebie przesadą – choć uwzględniali także przybyłych do Narola uchodźców – informowali o skali pogromu swoich pobratymców. Z kolei badacze, choć słusznie podważali te przesadzone wartości liczbowe, nierzadko jednak w sposób bardzo dowolny szermowali statystyką. Analiza różnorodnych przekazów źródłowych, w tym nieznanego w dotychczasowej historiografii dokumentu hebrajskiego, pozwoliła ustalić przebieg tragicznych zajść w mieście oraz ich demograficzne konsekwencje. Podważono przy tym przyjmowaną powszechnie strukturę wojennych ubytków populacyjnych, wysuwającą na pierwszy plan osoby zabite. Ustalono, że z ponad 1680 mieszkańców Narola (z tego 720 Żydów – 43%) pozostało prawie 500 osób, z tego 212 Żydów. W większości były to kobiety i dzieci. Bezpośrednio z rąk kozackich zginęło 85 Żydów, 140 uprowadzono w jasyr, z których jakaś część odzyskała wolność. Grupę 210 osób stanowili uciekinierzy żydowscy, przeważnie decydujący się – podobnie jak wykupieni z niewoli tatarskiej jeńcy – przesiedlić do innych ośrodków w kraju, a nawet za granicą. W najbliższych latach – w przeciwieństwie do części ludności chrześcijańskiej – nie chcieli wracać do miasta, głównie z powodu utrzymującego się stanu zagrożenia wojennego. Wręcz przeciwnie, najprawdopodobniej pozostające w mieście ocalałe wdowy i sieroty żydowskie w większości przeniosły się do Przemyśla, choć sporo ich też zmarło wskutek chorób i panującej epidemii. W rezultacie populacja Żydów skurczyła się do 62 osób w 1652 r., stanowiąc 19% globalnej liczby mieszkańców Narola, obliczanej na 331 osób. Dopiero w latach 60. XVII w., wraz z uspokojeniem nastrojów wojennych, zaczęło przybywać do miasta wielu Żydów.

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Towns and Villages of the Pomeranian Archdeaconry, 1780–1781: Population and Religion

Wsie i miasteczka w archidiakonacie pomorskim w latach 1780–1781. Ludność i religia

Abstract

During the canonical visitation ordered by Bishop Józef Rybiński of Włocławek and carried out in 1780–1781, the canonical recorders, in addition to the traditional description of many issues concerning the parish, also included information about the population in their reports. For this purpose, they used a tabular form in which the information was broken down by the individual villages belonging to the parish. This included not only the total number of inhabitants; the number of communicants, the number of non-Catholics and the number of Jews were also given.

Abstrakt

W trakcie wizytacji kanonicznej zarządzonej przez biskupa włocławskiego Józefa Rybińskiego i przeprowadzonej w latach 1780–1781 wizytatorzy, poza tradycyjnym opisem wielu zagadnień dotyczących parafii, załączali również do protokołów informacje o liczbie ludności. Wykorzystywali do tego formę tabelaryczną, podając informacje rozbite na poszczególne miejscowości należące do parafii. Dotyczyły one nie tylko samej ogólnej liczby mieszkańców. Podawano także liczbę osób zdolnych do komunii, liczbę niekatolików i liczbę Żydów. Analiza statystyczna tych danych pozwoli

The statistical analysis of these data will make it possible to determine with some precision the population of the parishes of the archdeaconry that were located in small towns and in rural parishes, as well as the population as a whole. The study also includes findings on such topics as the average size of a rural settlement, the ratio of urban to rural population, the percentage of Catholics, non-Catholics, and Jews, and the percentage of Catholics eligible for the Sacrament of Penance and Holy Communion.

Keywords

Pomeranian archdeaconry, Wloclawek diocese, parish visits, Józef Rybiński, parish population, Catholics, Protestants, Jews

w miarę precyzyjnie ustalić zaludnienie parafii archidiakonatu zlokalizowanych w małych miastach i w parafiach wiejskich, jak również określić liczbę ludności w całym archidiakonacie. W artykule autorzy przedstawią także ustalenia dotyczące takich zagadnień, jak średnia wielkość osady wiejskiej, stosunek liczby ludności miast do ludności wsi, odsetek katolików, niekatolików i Żydów oraz odsetek katolików zdolnych do przyjmowania sakramentu pokuty i komunii świętej.

Słowa kluczowe

archidiakonat pomorski, diecezja włocławska, wizytacje parafii, Józef Rybiński, liczba ludności parafii, katolicy, protestanci, Żydzi

Introduction

The parishes of the Roman Catholic Church in Poland in the 16th–18th centuries are rich in sources. Undoubtedly, the records of canonical visitations are one of the most important types of sources that show the problems of pre-Partition parishes in a broad context. Although canonical visitations had taken place before the Council of Trent, it was not until the Council's decrees that an ecclesiastical order to visit parishes was imposed.[1] According to the decisions of the Council, canonical visitations were to be conducted every two years. In Poland a three-year period was adopted, but it was not observed. Typically, parish visitations were held every few or even a dozen years. The result of these activities were very detailed visitation records that comprehensively described religious life, parish relations, endowments, equipment, clergy, and congregations. The importance of such sources has already been recognized in the literature on the subject.[2]

[1] Council of Trent. "Session 24: II, Canon 3: Zasady przeprowadzania wizytacji przez przełożonych," in *Dokumenty soborów powszechnych*, ed. Arkadiusz Baron and Henryk Pietras, vol. 4, *Lateran V, Trydent, Watykan* (Wydawnictwo WAM, 2004), 739.

[2] See Stanisław Litak, "Akta wizytacyjne parafii z XVI–XVIII w. jako źródło historyczne," *Zeszyty Naukowe KUL* 5, no. 3 (1962): 41–58; Stanisław Litak, *Parafie w Rzeczypospolitej*

Descriptions of parish visitations contain an enormous amount of material and allow for extensive and multifaceted research, including statistics and historical demography.[3] It is not the intention of the authors to dispute the achievements of the Prussian state statistics, since it is obvious that they are more accurate than statistical materials of ecclesiastical origin. In many respects, however, visitations can be a good complement to state statistics.

In the case of the archdeaconry under study, we have relatively well-preserved visitation material from the second half of the sixteenth century, although the eighteenth century is the best and most fully documented.[4] The first surviving records of episcopal visitations date from the 1680s and 1690s. These are the visitations of Bishop Hieronim Rozdrażewski.[5] It is worth adding that the visitation book of Bishop Mikołaj Gniewosz from 1649, kept in the Pelplin Archives, is actually a copy of Rybiński's visitation from 1595–1599, at least as far as the descriptions

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w XVI–XVIII w. (Wydawnictwo KUL, 2004), 29–31; Stanisław Olczak, "Wizytacje jako źródło do badań nad klerem parafialnym," *Summarium* 8 (1979): 253–258; Stanisław Olczak, "Źródła kościelne z końca XVI i pierwszej połowy XVII w. do badań nad duchowieństwem," *Przegląd Tomistyczny* 2 (1986): 275–291; Dariusz Główka, "Akta wizytacji kościelnych z XVII–XVIII w. jako źródło do historii kultury materialnej: gospodarstwo wiejskie w dobrach parafialnych w archidiakonacie warszawskim," in *Szkice z dziejów materialnego bytowania społeczeństwa polskiego*, ed. Maria Dembińska (Zakład Narodowy im. Ossolińskich, 1989), 233–254; Artur Hamryszczak, "Canonical Visitations as a Historical Source," *Archiwa, Biblioteki i Muzea Kościelne* 105 (2016): 53–62; Tomasz Nowicki, "Źródła do badań biograficznych nad osiemnastowiecznym katolickim duchowieństwem parafialnym," *Studia Archiwalne* 1 (2004): 102–103; Tomasz Nowicki, "Źródła do badań prozopograficznych nad duchowieństwem i personelem parafialnym diecezji włocławskiej w okresie nowożytnym," *Archiwa, Biblioteki i Muzea Kościelne* 112 (2019): 262.

[3] On the importance of visitation protocols for the study of historical statistics, see Boleslaw Kumor, "Przedrozbiorowe wizytacje kościelne jako źródło demograficzne," *Przeszłość Demograficzna Polski – Poland's Demographic Past* 2 (1969): 3–46, especially: 26–30. Compare also comments on the accuracy of demographic information contained in pre-partition church visitations, in Egon Vielrose, "Dokładność informacji demograficznych pochodzących z przedrozbiorowych wizytacji kościelnych," *Przeszłość Demograficzna Polski – Poland's Demographic Past* 2 (1969): 47–52.

[4] At this point, it is worth noting the repertories of the aforementioned visitations (without the 16th century visitations) compiled by W. Kujawski. See Witold Kujawski, "Repertorium ksiąg wizytacji kanonicznych biskupów kujawsko–pomorskich przechowywanych w Archiwum Diecezjalnym w Pelplinie," *Archiwa, Biblioteki i Muzea Kościelne* [part 1, 84 (2005): 93–236; part 2, 85 (2006): 149–304; part 3, 91 (2009): 119–269].

[5] In the Diocesan Archives in Pelplin [hereafter ADPel.] there are two copies of the records of this visitation. The first with reference G1a [for a detailed bibliographic description of all visitations, see Bibliography], and a doublet transcribed in 1767 with reference (sygn.) G1b. These visitations were published by Stanislaw Kujot in "Fontes Towarzystwa Naukowego w Toruniu", 13 (1897–1899) with the title *Visitationes Archidiaconatus Pomeraniae Hieronymo Rozrażewski Vladislaviensi et Pomeraniae episcopo factae*. On the other hand, the Diocesan Archives in Włocławek [hereafter ADWł.] holds records of parishes from virtually all the archdeaconries – ref. (sygn.) W4(98), W5(69), W6(70) and W7(71). Some of the visitation documents were published in *Monumenta historica dioecesis wladislaviensis* in volumes 15 and 19 [see Bibliography].

of the visitations are concerned, rather than a source describing the state of Pomeranian parishes in the mid-17th century.[6]

The next visitation of the whole archdeaconry by Bishop Bernard Madaliński did not take place until 1686–1687,[7] while the visitation of Archdeacon Krzysztof Szembek was undertaken in 1702–1703.[8] In 1710–1711 there was a visitation ordered by Bishop Konstantin Feliks Szaniawski.[9] In 1728–1729 a considerable part of the parish was visited by Archdeacon Józef Narzymski,[10] while in 1745–1750 most of the parish was visited by Archdeacon Augustyn Kliński.[11] These last two visitations, extensive and very detailed, covering all the parishes of the entire diocese of Włocławek at that time, were carried out by Bishops Kazimierz Ostrowski (1765–1766)[12] and Józef Rybiński (1779–1781)[13] under new political conditions for Royal Prussia, which had been largely occupied by Prussia during the First Partition.

Even the oldest visitations from the time of Bishop Rozdrażewski provide some data on the population of the parish, but they are not very precise, nor are they systematic. The source records sometimes contain information, for example, on the number of peasants living in certain parish settlements, but this is given in the context of the payment of tithes.[14] Furthermore, research on the territorial

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[6] ADPel., sygn. G11. The similarity between Rozdrażewski's last visitations and those of Gniewosz had already been described by [Jakub] Fankidejski, *Utracone kościoły i kaplice w dzisiejszej diecezji chełmińskiej*, (Pelplin, 1880), 157; Compare Tomasz Nowicki, "Organy w kościołach archidiakonatu pomorskiego w XVI–XVIII wieku," *Roczniki Humanistyczne* 66, no. 2 (2018): 61.

[7] ADPel., sygn. G20a and doublet G20b.

[8] ADPel., sygn. G24. This is supplemented by a book covering only the deaneries of Lębork and Puck: ibid, sygn. G25. Some of the entries from the deaneries of Gdańsk, Starogard and Tczew, mainly reformation decrees, date from 1703.

[9] ADPel., sygn. G26.

[10] ADPel., sygn. G40.

[11] ADPel., sygn. G56.

[12] The visitation of the Archdeaconry parishes is currently the following three books stored in the Diocesan Archives in Pelplin: sygn. G61, G62 and G63a (Pelplin also has an exact copy of this visitation: sygn. G63b).

[13] Visitation records for the Pomeranian part of the diocese are in five volumes and date from 1780–1781. Four are kept in Pelplin (sygn. G69, G70, G71 and G72), and one for the secular and Fordon deanery in Włocławek (sygn. W43[90]).

[14] For example, in the 1583 parish of Subkowy, information was recorded on 16 peasants in Subkowy alone and a further 33 in villages belonging to the parish. But at the same time, the recorder reported four settlements with a manor house and one entire settlement occupied by Protestants, but without giving the number of people (ADPel., G1a, k. 20v; "Visitationes," 65). In the parish of Lębcz, on the other hand, the assessor recorded: *Lepcze habet colonos duodecim*, but by the time he was in Chłapowo, the second village belonging to this parish, was no longer giving such information (ADPel., G1a, k. 4; "Visitationes," 13). In the parish of Oksywie, the assessor gave the number of peasants in each parish village, but in the case of the village of Mechówko, inhabited by homesteaders, he did not provide information on their number (ADPel., G1a, k. 6–6v; "Visitationes," 20).

divisions of the late sixteenth century shows that a large part of the settlements existing at that time were not included in the parish village inventories.[15] Later visitation documents were more precise, although they usually gave only an estimated number of Catholics.[16] An example of this is the large bishop's parish in Subkowy, located in the deanery of Tczew. During the visitation of Bishop Madaliński, the number of Catholics under the care of the parish priest was estimated at about 600.[17] On the other hand, the minutes of the archdeacon's visitation of 1703 gave more detailed data. Although the number of Catholics was then estimated at 1,000, it was added that there were also 5 Lutherans in the parish, and that under the incumbent Ordinary[18] twelve conversions had taken place.[19] In contrast, the description of the bishop's visitation from 1710–1711 lacks information on the number of parishioners.[20] Similarly, this data is missing from the records of Archdeacon Narzymski's visitation to Subkowy in the late 1720s.[21] In the documents of Archdeacon Kliński's visitation in 1746, the number of parishioners taking Easter communion was stated as *ultra 1,000,* and it was added that there were no Jews or Protestants in the parish.[22] On the other hand, the representative of Bishop Kazimierz Ostrowski, who visited Subkowy in 1765, noted that 1,170 people went to confession over Easter.[23]

As the example of Subkowy shows, the records providing information about the population of the parishes recorded in the visitations are inaccurate. They are estimates and approximations, usually including only parishioners who took communion, sometimes mentioning non-Catholics and Jews. A significant qualitative change occurred with the visitation of Włocławek ordered by Bishop Józef Rybiński, which was carried out throughout the diocese in 1779–1781. It is only through the records of this visitation that we have a much more accurate knowledge

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[15] See Marian Biskup and Andrzej Tomczak, "Mapy województwa pomorskiego w drugiej połowie XVI w.," *Rocznik Towarzystwa Naukowego w Toruniu* 58, no. 1 (1955): 58–73; compare Tomasz Nowicki, "Granice jednostek administracji kościelnej," in *Atlas historyczny Polski. Prusy Królewskie w drugiej połowie XVI w. Mapy szczegółowe XVI w. Suplement*, ed. Henryk Rutkowski and Marek Słoń (Instytut Historii Polskiej Akademii Nauk, 2021), 23–25, 29–30.

[16] See Bolesław Kumor, "Przedrozbiorowe wizytacje kościelne," 24. Compare the findings of Egon Vielrose ("Dokładność informacji demograficznych," 47–52) regarding the accuracy of rounded numbers reported in visitation protocols.

[17] ADPel., G20a: 79; G20b: 48v.

[18] From 1700, the Bishop of Włocławek was Stanislaw Szembek, older brother of Pomeranian archdeacon Antoni Szembek, during whose tenure the visitation was conducted.

[19] The visitation took place on February 12, 1703. See ADPel., G24: 316.

[20] ADPel., G26: 167 and N.N.

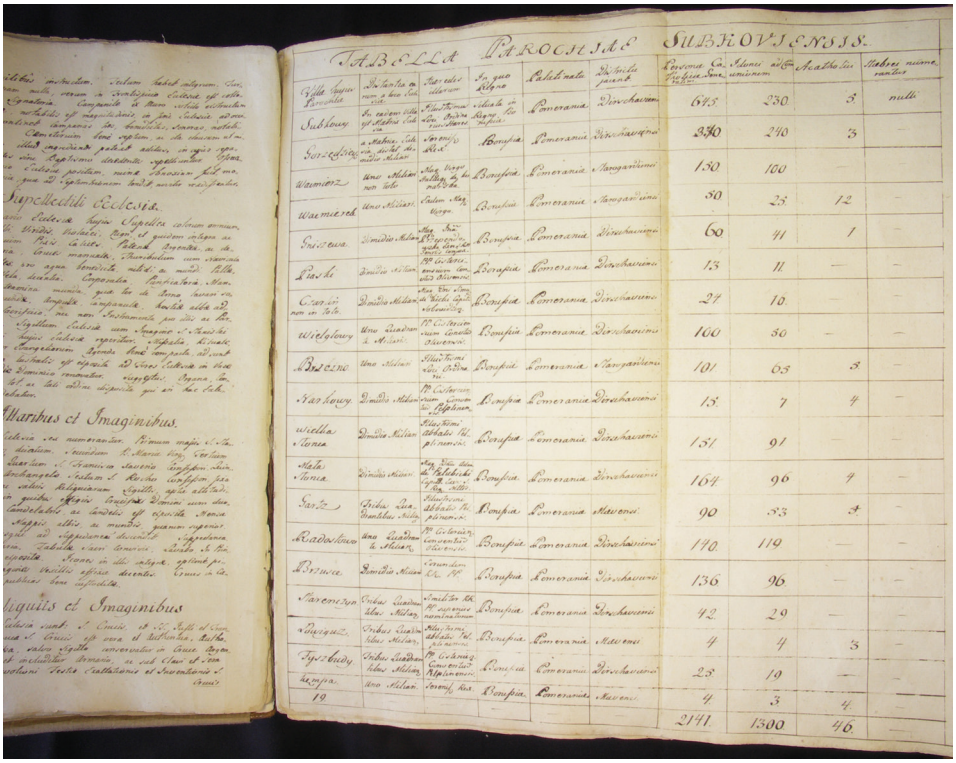
[21] ADPel., G40: 83 and N.N.

[22] ADPel., G56: 8.

[23] ADPel., G61: 226.

of the number of people living in the parishes of the diocese.[24] The description of the visitation itself includes data on the number of parishioners, but the value of the documentation lies in the fact that very detailed population tables were sewn into the book. These tables can be found in the vast majority of the records.

Figure 1. Table for the parish of Subkowy sewn into the 1780 visitation book



Source: ADPel., G70: 41.

Before moving on to a more detailed analysis of the data for the entire archdeaconry, we should return for a moment to the parish of Subkowy, which was examined in more depth. In 1780, when Rybiński's recorders arrived in the parish, there were a total of 2,141 Catholics living there, including 1,300 children who had not yet received communion. In addition, there were 46 non-Catholics in the parish

[24] This is in line with trends known at least since the census ordered by Bishop Antoni Sebastian Dembowski of Plock in 1742, also later already from the Enlightenment period [see Cezary Kuklo, *Demografia Rzeczpospolitej przedrozbiorowej* (Wydawnictwo DiG, 2009), 67].

at that time and no Jews. Furthermore, the table gives information broken down by parochial village. For example, it is known that in the village of Subkowy alone, where there was a parish church, there were a total of 645 Catholics (including 230 people who did not take communion) and 5 non-Catholics. For each of the 19 parish villages belonging to the Subkowy church, such a precise breakdown was given in the tables.[25] In many cases, the extraordinary detail of the figures given is striking. Such accuracy leads to the assumption that the information given is close to the reality of the number of inhabitants of the parish, and is more reliable than the earlier examples taken from the visitators' descriptions.

Scope of Information

As shown above with the example of the parish of Subkowy, the tables cover the territorial district of each parish. Before proceeding with the analysis of the source material, it is worth asking what information is provided by the visitators in the tables sewn into the visitation records. They were made according to a single model, each of which has ten columns with the following titles:

a. Villa hujus Parochiae
b. Distantia earum a loco Ecclesiae
c. Heredes illarum
d. In quo Regno
e. Palatinatu
f. Districtu iacent
g. Persone Catholice Generatim
h. Idonei ad Comunionem
i. Acatholici[26]
j. Haebrei numerantur.[27]

At the outset, it is also worthwhile to determine the number of parishes in the Pomeranian archdeaconry during the period of the visitation of Bishop Rybiński's delegates. From the information available so far, as well as from the records of

[25] ADPel., G70: 41.

[26] The term primarily includes Lutherans and Calvinists, to a lesser extent Mennonites. In Bishop Rybiński's tables, there is no distinction between the various denominations of Protestantism. Only by the village of Shulweza in the table for the parish of Gniew, but in the section on Jews, the recorder added that there were 50 Mennonites living there (compare ADPel., G71: 83a). For a more detailed discussion of Mennonites in Royal Prussia, see Edmund Kizik, *Mennonici w Gdańsku, Elblągu i na Żuławach Wiślanych w drugiej połowie XVII i w XVIII wieku* (Gdańskie Towarzystwo Naukowe, 1994).

[27] Compare Kumor, "Przedrozbiorowe wizytacje kościelne," 24–25.

the visitation, it is possible to identify 93 parishes in the archdeaconry. In addition, there were 66 other parishes, 20 of which had their own districts and were administered by priests from neighboring parishes.[28] These affiliated parishes sometimes had separate tables, but sometimes were included in the tables of the main parish. The following table shows the number and percentage of parishes by deanery division that have detailed tables included in Bishop Rybiński's visitation.

Table 1. Number of parishes in the Pomeranian archdeaconry and share of tabular information on population in Bishop Józef Rybiński's visitations (1780–1781)

Deanery	Number of parishes	Tables with information on population	
		Number	Fraction
Bytów	6	6	1
Fordon	7	5	5/7
Gdańsk	10	9	9/10
Gniew	10	9	9/10
Lębork	1	1	1
Mirachowo	9	9	1
Nowe	9	9	1
Puck	8	6	3/4
Starogard	9	9	1
Świecie	14	13	13/14
Tczew	10	10	1
Total	93	86	86/93 (92.5 %)

Source: ADPel., G69: 3v, 104, 114v; G70: 3-3v, 321av; G71: IVv-V, 15a; G72: 1v-2, 8v-9, 64a-64av; ADWł., W43(90): 3v-4, 417v-418.

For most of the deaneries (Bytów, Lębork, Mirachowo, Nowe, Starogard, Tczew), the visitation documents of 1780–1781 included tables for each parish. For three deaneries (Gdańsk, Gniew, Świecie) one list was missing. The largest gaps were found in the deanery of Fordon (5 lists for a total of 7 parishes) and in the deanery of Puck, where population tables for two circles were missing for 8 parishes.

[28] On this subject, see the detailed research by Tomasz Nowicki, "Liczba i sieć świątyń w archidiakonacie pomorskim w l. 1583–1781", *Studia Pelplińskie* 27 (1999): 176–182; Tomasz Nowicki, *Ministri ecclesiae. Służba kościelna i witrycy w diecezji włocławskiej w XVIII w.* (Towarzystwo Naukowe KUL, 2011), 53–60. Compare the findings of Stanislaw Litak, *Kościół łaciński w Rzeczypospolitej około 1772 roku* (Towarzystwo Naukowe KUL, 1996), 334, 337–342; Stanisław Litak, *Atlas Kościoła łacińskiego w Rzeczypospolitej Obojga Narodów w XVIII w.* (Towarzystwo Naukowe KUL, 2006), 91, 314, 316–319.

Overall, however, the percentage of parishes for which tables have been preserved was 92.5% for the entire archdeaconry: of the 93 parishes recorded in the years studied, tables were preserved for 86 centers. It should be added that in the case of the Gdańsk parish, the parish priest had a rural benefice in Pręgowo, for which a table with population figures was included in the visitation report. There are also separate tables for the parishes of Bzowo (administered by the parish priest of Lubień Wielki), Cekcyn (administered by the parish priest of Bysław) and Opalenie (administered by the parish priest of Piaseczno).[29] The other territorial parishes are summarized in the tables of the parish churches, but on the basis of the descriptions of the visitators it is possible to identify the villages included in the respective territorial districts.[30]

Now we will analyze the number of tables, taking into account the location of the parish church in the city or in the country. There were 14 urban centers in the Pomeranian archdeaconry during the period under review. In addition to the already mentioned largest city of Royal Prussia, Gdańsk, which did not have a visitation protocol and thus a population table, they are also missing for Świecie.[31] The remaining towns have population tables (86%).[32] We do not include the Collegiate City of Chełm, which Prussian King Frederick II created in 1772 from four villages in the vicinity of Gdańsk that had been ecclesiastical property prior to Partition, i.e., Chełm, Stare Szkoty, Siedlce and Święty Wojciech. This is because it was an artificial and short-lived urban entity created to compete with Gdańsk, which was still in the Republic of Poland.[33]

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[29] For example, the parish of Cekcyn (Świecie deanery) served by the parish priest from Bysław (the table title even records *Tabella Parochia Filialis Cekcynensis*) is included in a separate table (see ADWł., W43(90): 225v–226).

[30] For example, the large parish of Lubichowo (Starogard deanery), which was administered by the parish priest from Zblewo, was included in the summary table just for Zblewo. However, in the table, after the villages lying in Zblewo's parish ward, the villages lying in the Lubichowo ward were singled out, giving *Lubichowo cum suis Villis* and listing them below (see ADPel., G70: 343–343v).

[31] We can go back to earlier visitations, but for the 1765 Royal Chapel in Gdansk, the assessor did not specify the number of parishioners (ADPel., G62: 1–5). Similarly, the 1766 visitation of the parish of Świecie does not record the number of parishioners, but only states that the *Lutherani et Menonistae seu Anabaptistaae per multi in hac Parochia* (ADPel., G62: k61v). In contrast, according to Emil Waschinski's calculations (*Wie gross war die Bevölkerung Pommerellens, ehe Friedrich der Grosse das Land übernahm?* [Danzig, 1907], 35) in 1766, there were 3,800 people living in Świecie Parish, including 1,800 Catholics and 2,000 Lutherans.

[32] In the case of Lębork, the assessor gave only the number of Catholics (see ADPel., G69: 98a).

[33] See "Stolzenberg," in *Słownik geograficzny Królestwa Polskiego i innych krajów słowiańskich* 11 (Warszawa, 1890): 362; Ewa Barylewska-Szymańska and Zofia Maciakowska, *Miasto i ludzie u progu nowoczesności. Socjotopografia Gdańska w pierwszej połowie XIX w.* (Instytut Historii Polskiej Akademii Nauk, 2016), 39; Alicja Marcinkiewicz, "Dzieje Królewskiego Zespolonego Miasta Chełm w latach 1772–1813," in *Historie gdańskich dzielnic*, ed. Janusz Dargacz, Katarzyna Kurkowska and Piotr Paluchowski, vol. 1 (Polska Akademia Nauk, 2018): 226–251. The collegiate city of Chełm is also not included in Andrzej Groth's studies of small Prussian cities ("Małe miasta pomorskie w 1777 roku," *Słupskie Studia Historyczne* 12 [2006]: 53; *Małe miasta pomorskie w latach 1772–1806* [Wydawnictwo Naukowe Akademii Pomorskiej w Słupsku, 2009)]: 5).

However, for parishes with a rural center, population data are available for 79 centers (94%).[34] Tables are missing for five rural parishes: Żarnowiec and Swarzewo in the deanery of Puck, Wielki Garc in the deanery of Gniew, and Osielsko and Włóki (as well as for Wudzyn, which does not have a separate table) in the deanery of Fordon. In the case of Swarzewo and Włóki, the population for the entire parish (without breaking it down into individual settlements) can be determined by reading the surviving visitation records.[35] In other cases there are no visitation records at all for Bishop Rybiński's visitation.[36]

The title of the article uses the phrase villages and towns. This is justified, since the only significant town in the Pomeranian archdeaconry was Gdańsk, for which perhaps no table was compiled at all, since it was a decidedly Protestant town and Catholics were in the minority. It is likely that the parish priest of Gdańsk did not have accurate data, especially on Protestants.[37] Other urban centers, as shown in the tables, had a maximum of just over 4,000 inhabitants at the time (Tczew[38]), but most had a population of around 1,000.

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[34] Also counting the above mentioned 3 subsidiary churches with the parish district having separate listings.

[35] The entire parish of Swarzewo, which consisted of at least eight settlements, was home to 1,459 Catholics and 297 non-Catholics. No Jewish population was recorded (ADPel. G72: 35). There were 372 Catholics and 112 non-Catholics in Włóki parish (including the Wudzyn branch) (ADWł., W43[90]: 464, 465).

[36] Although a visitation protocol from Osielsko has survived, it does not record the number of parishioners, referring to a table not found in the visitation (ADWł., 43[90]: 550v). From the 1745 visitation, it is known that 524 parishioners in Osielsko and the Żołędowo parish received Easter confession, while there were 5 non-Catholics with their families (ADWł., W20 [081]: 21v, 23). On the other hand, for the Żarnowiec parish, the surviving visitation protocol dates back to 1711. However, there is no information there about the number of parishioners (ADPel., G26: 61–63). In the case of Wielki Garc, refer to the 1765 visitation of Bishop Ostrowski (see ADPel., G61: 433–445). At the time, the parish recorded 561 parishioners going to confession at Easter (ADPel., G61: 438).

[37] The population of Gdansk in the mid-1700s was estimated at around 46,000. Before 1772, the number had risen to about 50,000 residents (see Stanisław Hoszowski, "Spis mieszkańców Gdańska z 1770 r.," *Przeszłość Demograficzna Polski – Poland's Demographic Past* 7 [1975]: 87–89), but by the time of partition it had declined to 36,231 (see Barylewska-Szymańska and Maciakowska, *Miasto i ludzie*, 112). In the 1780s, it had only slightly increased and stood at about 37,000 (see Jan Baszanowski, *Przemiany demograficzne w Gdańsku w l. 1601–1846* [Wydawnictwo Uniwersytetu Gdańskiego, 1995], 171; Sławomir Kościelak, *Katolicy w protestanckim Gdańsku od drugiej połowy XVI do końca XVIII w.* [Wydawnictwo Uniwersytetu Gdańskiego, 2012], 341–342). In 1793, the city continued to have a population of about 36,700 (see August E. Preuß, *Preußische Landes- und Volkskunde* [Borntrager, 1835], 398). According to Barylewska-Szymanska and Maciakowska (*Miasto i ludzie*, 113–114), based on data taken from Christian F. Wutstrack's work, the number in 1793 was exactly 36,630, and 36,738 a year later. In 1804, according to August K. von Holsche (*Geographie und Statistik von West-Süd- und Neu-Ostpreussen. Nebst einer kurzen Geschichte des Königreichs Polen bis zu dessen Zertheilung* [Maurer, 1807], Vol. 3: 120) In 1804, according to August K. von Holsche, Gdansk had a population of 49,465, but that included 5,410 people in the Gdansk military garrison. Barylewska-Szymańska and Maciakowska (*Miasto i ludzie*, 114) found that the population of Gdańsk in 1804 was exactly 44,055.

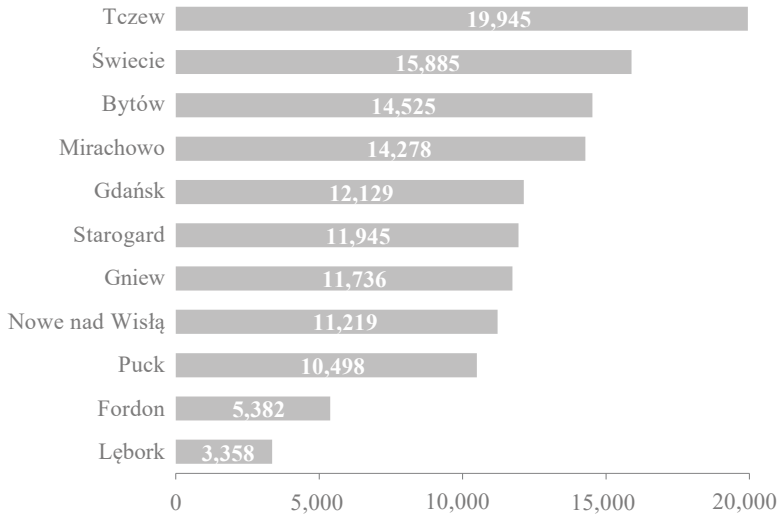
[38] Which seems inflated anyway (see below).

It should also be noted that the priests of the Catholic parishes were best informed about the number of Catholics. They certainly gave less reliable figures for non-Catholics, and completely speculative figures for Jews. This is evidenced by the numbers quoted. For Catholics, the numbers are very often given in increments of one person. This is much less often the case for non-Catholics. Jewish population figures are usually given to the nearest 10 or 5 people.

Population of the archdeaconry

Let us now consider the population that can be calculated on the basis of Rybiński's tables. As can be seen from the source material that was analyzed, the total population of the Pomeranian archdeaconry, according to the tabular data from Rybiński's visitation, was slightly over 130,000 people.

Figure 2. Population of the archdeaconry according to Bishop Rybiński's tables from 1780–1781 (by deanery)



Source: ADPel., G69: 5a, 5b, 5c, 23a, 41a, 54a, 67a, 98a-98c, 117a, 132a, 144a, 157a, 170a-170b, 187a, 195, 209a, 227a, 245-246; G70: 9-9v, 41a, 54-54v, 76a, 93a, 110a, 134-134v, 150a, 178a, 182-182v, 197-197v, 249-249v, 282a, 302a, 324a, 343-343v, 380a, 390v-391, 403-403v, 409, 422, 429-429v, 442-442v; G71: 15a, 21a, 28v-29, 39a, 47a, 62, 83a, 112a, 124a, 129v-130, 175a, 182v-183, 194c, 198v, 209c, 214v-215, 220a, 225a, 232a, 250a, 257a, 291a, 291b, 298, 311a, 317, 324, 332; G72: 12a, 35, 45a, 72a, 91a-92, 105a, 120, 144a, 174a, 185a, 195a, 206a, 218a-219, 234a-235, 249a, 271a, 288a-289, 299a, 315a, 334a; ADWŁ., W43(90): 12, 32, 56, 86, 119, 147, 170, 198, 226, 249, 277, 313a-313b, 348, 401, 432, 443, 464, 474, 484, 505.

The largest population was recorded in the parishes of the Tczew deanery, with a total of almost 20,000 people. On the other hand, the deanery of Lębork had the smallest population, but in this case it should be taken into account that the bishop's recorders probably did not know the exact number of people living in this area. It was an area with a predominantly Protestant population. The parish priest of Lębork certainly did not have full knowledge of their numbers. For Lębork alone and eight other villages, he gave the visiting priest a generalized statement that Protestants in the area were very numerous.[39] Such general formulations make it impossible to give a more accurate total number of people living in the various parishes of the archdeaconry. For the sake of comparison, let us look at the population figure for the year 1766, calculated by Emil Waschinski. According to his estimates, the population of the Pomeranian archdeaconry (excluding Fordon, Lębork, and part of the Bytów deanery, for which Waschinski does not provide complete data) could have been about 124,000, a figure comparable to the population of the Pomeranian archdeaconry (excluding the deaneries mentioned above), which, according to Rybiński's tables, was about 122,000.[40] However, Prussian statistics and historians' research based on them show that after 1772 the population of all Royal Prussia decreased as a result of the flight from recruitment into the Prussian army. The mass character of the exodus was recorded until 1780. In later years it decreased somewhat, but many young men continued to flee to the territory of the Republic.[41] These losses were not compensated by the colonization carried out by the Prussian authorities. It is clear, therefore, that the number of these processes must have affected the population of the Pomeranian Province and the Pomeranian archdeaconry that belonged to it.[42]

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[39] Examples of wording include *sine numero* (Lębork), *reliqui omnes* (Malszyce), *omnes* (Felkau), *permulti* (Nowa Wieś, Garczegorze), *omnes praeter expressos* (Kamlau, Łebunia) – see ADPel., G69: 98a.

[40] We should add that the entire area of the former Pomeranian province (taking into account the Tuchola and Człuchów districts, but excluding parts of the Bytów deanery, the entire Lębork and Fordon deanery located outside of Royal Prussia) was inhabited by 141,229 people in 1766, according to him. See Waschinski, *Wie gross war*, 47. Regarding Waschinski's findings see Zygmunt Szultka, *Studia nad społeczeństwem województwa pomorskiego Prus Królewskich. Ze szczególnym uwzględnieniem ludności kaszubskiej (XVI–XVIII wiek)* (Muzeum Piśmiennictwa i Muzyki Kaszubsko-Pomorskiej w Wejherowie, 2021), 138–141.

[41] Szultka, *Studia nad społeczeństwem*, 155–156.

[42] For the population of West Prussia as a whole and the demographic trends of West Prussia from 1773 to 1806, see Szultka, 151–158.

Towns of the Archdeaconry

We will now examine the population of the towns of the Pomeranian archdeaconry. The following table shows the population data. The table also shows the population of the towns based on detailed Prussian statistics kept at the Geheimes Staatsarchiv Preussischer Kulturbesitz in Berlin for the years 1774, 1777, and 1798.[43] For comparison, the number of registered residents for the 1780s, taken primarily from studies known as Prussian Official Literature, was included in the table.[44]

Table 2. Comparison of the population of the towns of the Pomeranian archdeaconry from the visitation tables of 1780–1781 with the population based on the Prussian official sources

Town	1774[a]	1777[b]	1780–1781[c]	Official records	1798[d]
Bytów	.	.	2,217	990[e]	.
Fordon	.	.	954	1,119[f]	.
Gniew	1,091	1,107	1,040	1,374[g]	1,278
Koronowo	.	.	969	756[h]	.
Kościerzyna	505	514	470[i]	600[j]	783
Lębork	.	.	?[k]	1,380[l]	.
Nowe nad Wisłą	1,097	1,195	964	1,330[m]	1,468
Puck	758	814	769	.	960
Skarszewy	893	996	1,869[n]	1,029[o]	1,279
Starogard	1,263	1,273	1,820	1,410[p]	1,711
Świecie	1,630	1,643	.	1,780[q]	2,017
Tczew	1,296	1,447	4,349	1,587[r]	1,556
Wejherowo	717[s]	750	822	700[t]	864

[a] See Kędelski, "Ludność Pomorza Nadwiślańskiego", 16; Groth, "Małe miasta pomorskie w 1777 roku," 65; Groth, "Małe miasta pomorskie w latach 1772–1806," 52.
[b] See Groth, "Małe miasta pomorskie w 1777 roku," 65; Groth, "Małe miasta pomorskie w latach 1772–1806," 52.
[c] Bytów: ADPel., G69: 5a; Fordon: ADWł., W43(90): 443; Gniew: ADPel., G71: 83a; Koronowo: ADWł., W43(90): 484; Kościerzyna: ADPel., G69: 117a; Lębork: ADPel., G69: 98a; Nowe: ADPel., G71: 250a;

[43] The Prussian materials were meticulously researched by Groth (*Małe miasta pomorskie w 1777 roku*, 53–74; Groth, "Małe miasta pomorskie w latach 1772–1806"). Compare Mieczysław Kędelski, "Ludność Pomorza Nadwiślańskiego w 1774 r. na podstawie tabel historycznych," *Przeszłość Demograficzna Polski – Poland's Demographic Past* 21 (2000): 7–33.

[44] We took into account two studies, the first by Johann F. Goldbeck, *Volständige Topographie des Königreichs Preussen*, Teil II: *Topographie von Westpreussen* (Marienwerder, 1789) and the second by Christian F. Wutstrack, *Kurze historisch-geografisch-statistische Beschreibung von dem königlich-preussischen Herzogthume Vor- und Hinter-Pommern* (Stettin, 1793).

Puck: ADPel., G72: 12a; Skarszewy: ADPel., G70: 9–9v; Starogard: ADPel., G70: 249–249v; Tczew: ADPel., G70: 197–197v, 212v–213; Wejherowo: ADPel., G72: 091a-092, 105a.
[d] See Groth, "Małe miasta pomorskie w latach 1772–1806," 52.
[e] Wutstrack (*Kurze historisch-*, 726) gave data for 1782. 20 Jews were thought to be living in Bytów at that time. Compare Gustaw Kratz, *Die Städte der Provinz Pommern – Abriß ihrer Geschicht, zumeist nach Urkunden* (Berlin, 1865), 52.
[f] See Goldbeck, *Volständige Topographie*, 84.
[g] See Goldbeck, *Volständige Topographie*, 64. Goldbeck added 277 Prussian garrison soldiers here.
[h] See Goldbeck, *Volständige Topographie*, 85.
[i] The city's population is given, noting that it also includes the surrounding hamlets (ADPel., G69: 117a).
[j] Goldbeck, *Volständige Topographie*, 67.
[k] The table gives only the number of Catholics, presumably an estimate – 300 people, with another 50 Jews included. No mention was made of how many Protestants there were (See ADPel., G69: 98a).
[l] According to Wutstrack (*Kurze historisch-*, 721) in 1782 Lębork had 1380 residents, including 30 Jews. In contrast, the later author Kratz (*Die Städte der Provinz Pommern*, 250) claimed that Lębork had 1,318 inhabitants in 1782.
[m] In 1780 – Goldbeck, *Volständige Topographie*, 65.
[n] The city's population is given, noting that it also includes four suburban settlements.
[o] See Goldbeck, *Volständige Topographie*, 66.
[p] Data for 1782, excluding army barracks – Goldbeck, *Volständige Topographie*, 63.
[q] Goldbeck, *Volständige Topographie*, 72.
[r] Goldbeck, *Volständige Topographie*, 52.
[s] Data for 1773.
[t] Goldbeck, *Volständige Topographie*, 53.

As can be seen, there are sometimes quite large discrepancies between the data in the visitation tables and the data provided by the Prussian authorities and in Prussian historical, geographical, and statistical publications. This is particularly evident in several cases. First of all, there is a significant difference in the number of inhabitants of Tczew, which cannot be explained by the difference of a few years. According to Prussian statistical sources, the town had only 1,296 inhabitants in 1774 and 1,447 in 1777. Also later in the 1780s and in 1798, the population of Tczew was less than 1,600. Meanwhile, in the case of this town, Rybiński's visitation tables significantly overestimated the number of inhabitants, especially, it seems, the number of Protestants. Most likely, this is simply an error on the part of the recorders. As mentioned above, in the bishop's visitation records there is also a second table for the parish of Tczew, most likely drawn up by the parish priest, in which only the number of Catholics is given, while for Protestants and Jews there is an added note, *non possunt sciri*.[45] Thus, if we disregard the first number given in the second table, we would have not 3,641 but 641 Protestants in Tczew. If we add 508 Catholics and a Jewish settlement of about 200 people,[46] we can conclude that the population of Tczew in 1781 would have been 1,349, which is a number that coincides with the Prussian data.

[45] See ADPel., G70: 213.

[46] However, it should be added that Goldbeck (*Volständige Topographie*, 52) reported that only 23 Jews belonged to the Jewish community.

Other minor or major differences in the reported number of inhabitants between the sources of the Prussian administration and the tables of Rybiński's visit concern Bytów,[47] Skarszewy,[48] Starogard,[49] Fordon,[50] Nowe[51] and Koronowo.[52] For the other cities, the numbers are similar, which may indicate that the parish priests' findings were fairly accurate.[53]

To conclude this part of the article, we will try to estimate the population living in the towns of the Pomeranian archdeaconry. As we remember, the data for Gdańsk and Świecie are missing, but according to the Prussian data mentioned above, we can assume that in the 1780s Gdańsk was inhabited by about 37,000 people,[54] while the population of Świecie at that time was about 1,780.[55] The exact number of inhabitants in Lębork is not known, as the tables do not include non-Catholics.

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[47] The figures from the visitation are more than twice as high as Wutstrack reports. A total of 93 Catholics and as many as 2,068 Protestants were said to live in Bytów, a figure that is significantly inflated in the context of Prussian data.

[48] Tables from 1774 give a population of 893, while in 1777 it was 996. The numbers given for 1782 correlate with these figures: 1,029 residents, which is still significantly less than in Rybiński's visitation. What is the reason for this? The table in the visitation records *Skarszewy cum attinentis*, which would indicate that the surrounding population not necessarily living in the town was also counted in this instance. In the inspection text drawn up by the parish priest, several settlements were mentioned which are not in the table, and which are most likely behind the term *cum attinentis* (See ADPel., G70: 9–9v, 20).

[49] In the case of Starogard, the difference between the available Prussian data and Rybiński's table is less than in Skarszewy, by about 550 people. An explanation for this discrepancy may be that the inspection also counted soldiers from the Prussian garrison mentioned by Goldbeck (*Volständige Topographie*, 63). In addition, it is worth noting that the numbers of Starogard residents given in the inspection tables are certainly estimates, as they are rounded up to hundreds and tens (900 Catholics, 800 Catholics and 120 Jews – ADPel., G70: 249–249v).

[50] For this town, the visitation tables show some underestimation of the population in relation to Prussian sources. This is most likely due to the underestimation of the number of Protestants (200 people are given) and especially Jews (500 people are given).

[51] As in Fordon, the visitation tables give a lower population than official Prussian statistics, which may also be due to an underestimation of the Jewish population, whose numbers were rounded up to 150 in Nowe by the parish priest.

[52] In the case of Koronowo, inspection tables at the time of Bishop Rybiński give a higher number of town residents (969), than official Prussian materials (756 in 1782).

[53] The numbers were very similar in Gniew, where 1,091 people were thought to be living in 1774, and 1,107 in 1777. A recorder reported a relatively similar population of 1,040 in the early 1780s. There was a similarly small disparity in Puck (758 people in 1774, 814 in 1777 and 769 in Rybiński's visitation) and Kościerzyna (505 people in 1774, 514 in 1777 and 470 in Rybiński's visitation). A relatively small difference was recorded in Wejherowo: Rybiński's visitation listed 822 people, while sources of Prussian provenance mentioned 717 people in 1773, 750 in 1777, 700 in around 1782 and 864 residents in 1798.

[54] See footnote 37.

[55] Number given for the Goldbeck study (*Volständige Topographie*, 72). In contrast, according to Hans Maerckaer ("Eine polnische Starostei und preussischer Landrathkreis. Geschichte des Schwetzer Kreises 1466–1873," *Zeitschrift des Westpreussischen Geschichtvereins* 18 [1886]: 146) in 1785, there were 955 Catholics, 720 non-Catholics and 30 Jews in Świecie, a total of 1,705 people.

We assume, in line with Ch. F. Wutstrack, that it was about 1,380 people. If we total all the numbers, both from the visitation and from the Prussian data, we can estimate the urban population of the Pomeranian archdeaconry at about 55,000–56,000 people. If we add the inhabitants of the aforementioned so-called Collegiate City of Chełm near Gdansk, whose number was then estimated at about 6,000 people, the urban population living in the Pomeranian archdeaconry in the early 1780s may have numbered several thousand more.

The Villages of the Archdeaconry

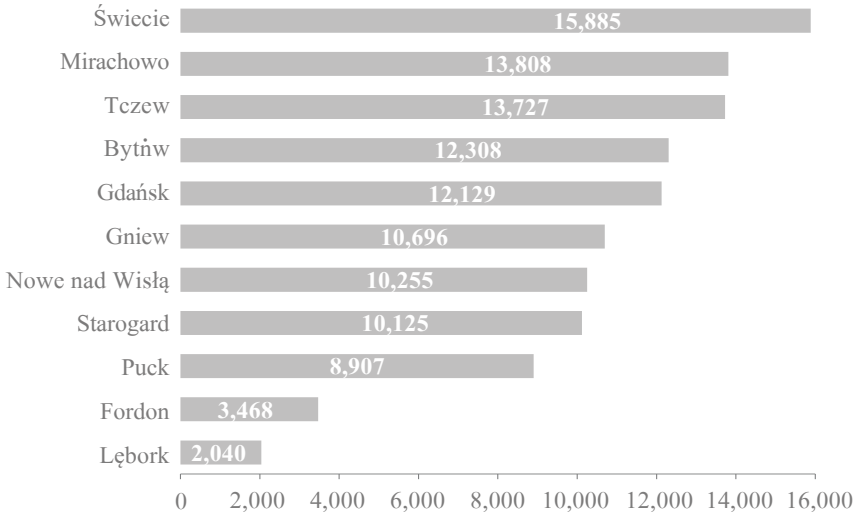
Let us now present the number of inhabitants of the villages belonging to the parishes of the Pomeranian archdeaconry. According to the data obtained from the tables of Bishop Rybiński, there were 113,348 inhabitants. However, we should remember that we have no data for Wielki Garc (deanery of Gniew) and for Osielsko (deanery of Fordon). Moreover, the data for the rural population in the parishes of the Lębork deanery and part of the Bytów deanery are probably incomplete. Above all, there is a lack of information about the population of villages in the Gdańsk area (in Gdańsk Bay, the Vistula Spit, the Gdańsk Uplands and the Hel Peninsula). The final number of the rural population living in the Pomeranian archdeaconry in the early 1780s is therefore difficult to estimate, but certainly higher than the data in the visitation tables.[56] For now, however, let us focus on the visitation tables themselves. The chart shows the number of village inhabitants by deanery.

As can be seen from the above graph, the deanery with the largest rural population was that of Świecie, while the deanery with the smallest population was that of Lębork (with the caveats mentioned above). Bishop Rybiński's recorders recorded relatively few rural inhabitants in the Fordon deanery. However, it should be noted that, firstly, this was a small territorial deanery and, secondly, the number of parishioners living in rural areas was underestimated due to the lack of information for the large rural parish in Osielsko.[57] In the other deaneries of the Pomeranian archdeaconry, the rural population ranged from almost 14,000 in the deanery of Mirachowo to almost 9,000 in the deanery of Puck.

[56] Similar difficulties in determining the rural population are mentioned by Kędelski ("Ludność Pomorza Nadwiślańskiego," 23–24), who goes on to highlight the lower reliability of the data.

[57] See footnote 36.

Figure 3. Number of village inhabitants in the Pomeranian archdeaconry by deanery (1780–1781)



Source: as in Figure 2.

Let us try to determine the average size of a rural settlement, also taking into account the division into deaneries. The tables record at least 1,318 rural settlements of various types. They include villages, manors, hamlets, forest settlements, wastelands, inns, mills or even individual houses in places with a specific name.[58] In some of the tables the descriptions are grouped, i.e., under one entry the recorder reports on the main village with the neighboring villages, sometimes giving their exact names. It should be noted that there were actually more toponymic units. It would be a tedious and time-consuming task to present all entries clearly and accurately; in many cases it would be impossible due to a lack of complete information. But at least on the basis of the available information it is worth analyzing and trying to find averages, while indicating examples of the most populous rural settlements of the archdeaconry.

[58] On the types of rural settlements in the Pomeranian Voivodeship see Krzysztof Mikulski, *Osadnictwo wiejskie województwa pomorskiego od połowy XVI do końca XVII w.* (Towarzystwo Naukowe w Toruniu, 1994), 9–11.

Table 4. Average population of Pomeranian villages by deanery based on Bishop Rybiński's tables from 1780–1781

Deanery	Number of localities	Number of inhabitants	Average per settlement
Bytów	130	12,308	94.7
Fordon	48	3,468	72.3
Gdańsk	146	12,129	83.1
Gniew	81	10,696	132.0
Lębork	48	2,040	42.5
Mirachowo	138	13,808	100.1
Nowe	133	10,255	77.1
Puck	84	8,907	106.0
Starogard	148	10,125	68.4
Świecie	245	15,885	64.8
Tczew	134	13,727	102.4
Archdiocese	1,335	113,348	84.9

Source: as in Figure 2.

The table shows that the average Pomeranian village was inhabited by almost 85 people. However, this may be a slightly inflated figure. As mentioned above, in the tables the number of inhabitants may have been given next to some settlements together with their neighboring villages sometimes mentioned in the source under study. However, this was not a widespread and frequent practice of the recorders. It was used more often in regions with high forest cover and consequently sparser settlements, such as in the Mirachowo deanery. In the vast majority of cases, the recorders entered certain settlements without adjacent neighborhoods in the tables. This problem is illustrated in the graph below.

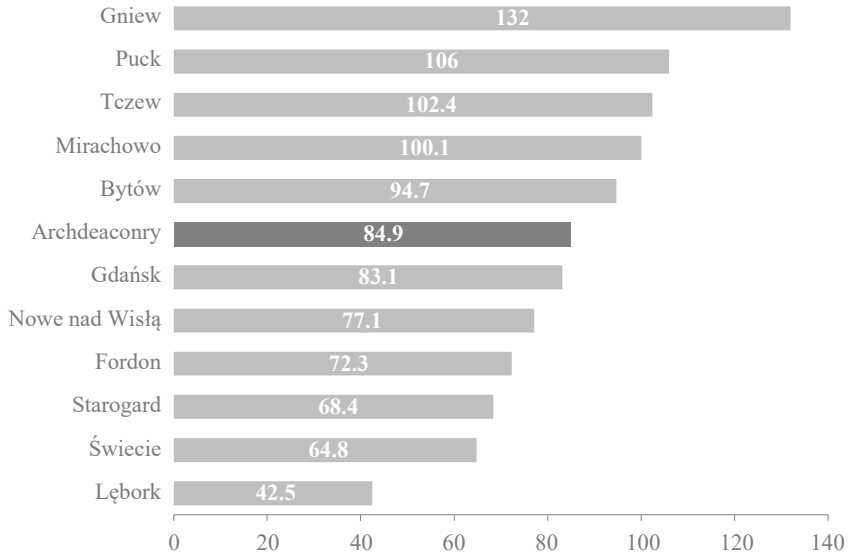
The calculations presented here show that the villages in the Gniew, Tczew, Puck and Mirachowo deaneries had the largest number of inhabitants (taking the average, of course), while the villages in the Lębork, Świecie and Starogard deaneries had the smallest. The smallest villages were in Lębork, Świecie and Starogard.

There are, of course, great differences between the largest and smallest recorded settlements. The largest villages were usually those which were the parish center. The largest village in the entire archdeaconry was Subkowy in the Tczew deanery with 650 inhabitants, which belonged to the bishops of Włocławek before the Partitions. Komorsk Wielki in the deanery of Nowe had 593 inhabitants, while 561 people lived in Święty Wojciech (St. Adalbert) in the Gdańsk deanery.[59]

[59] We treat St. Adalbert's Parish as a rural parish, although it should be remembered that from 1772 the locality was part of the Collegiate City of Chełm created by Prussian King Frederick

In contrast the largest village that was not the center of a parish was Suchostrzygi in the parish of Tczew, with 499 inhabitants. On the other hand, the smallest settlements were usually colonies, mills or even single houses, but had a specific topographical name. The recorders also gave 7 names of topographical units with no inhabitants. A closer analysis of each case could determine whether this was due to a lack of knowledge on the part of the parish priest giving the information to the recorder, or whether these settlements were actually uninhabited.

Figure 4. Average number of inhabitants in rural settlements of the Pomeranian archdeaconry based on Bishop Rybiński's tables, based on tables from 1780–1781 (by deanery)



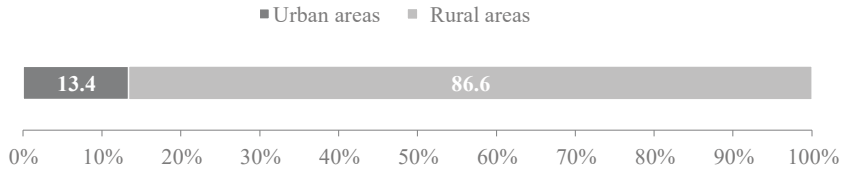
Source: as in Figure 2.

Ratio of Urban to Rural Population

Now that we know how many urban and rural residents were recorded in Bishop Rybiński's tables, the question of the ratio of urban to rural population arises. As can be seen from the graph below, the vast majority of the population of the archdeaconry lived in rural settlements, and only slightly over 13% lived in urban centers, but these data from the visitation tables are not exhaustive.

as a counterweight to Gdańsk, which remained within the borders of the Kingdom of Poland. See "Stolzenberg," 362; Marcinkiewicz, „Dzieje", 226 and N.N.

Figure 5. Ratio of rural to urban population based on Bishop Rybiński's tables from 1780–1781



Source: as in Figure 2.

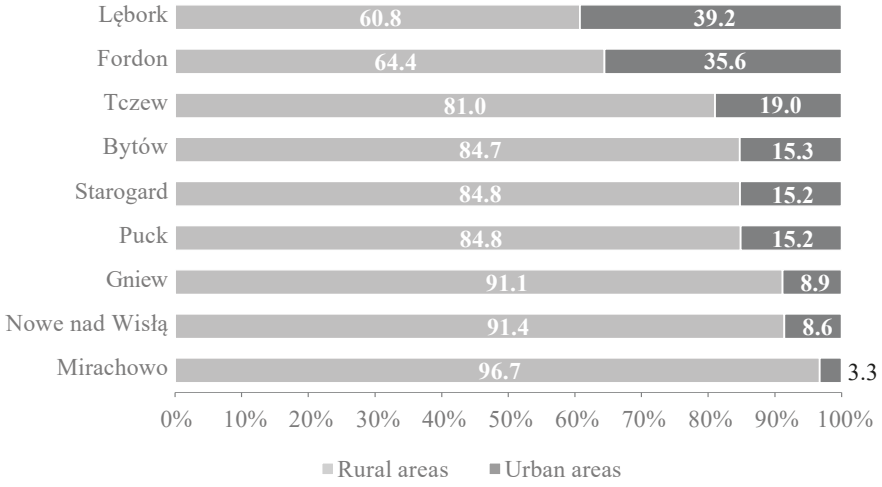
As Zygmunt Szultka points out, the question of the population of Royal Prussia and its division into urban and rural population is still highly controversial.[60] However, we should at least try to determine the estimated percentage of the urban population referring only to the area of the archdeaconry. If we add the urban population of Gdańsk and Świecie, which is not yet included in the table (about 55,000–56,000 people in total), to the values given in the tables for the cities,[61] it would be possible to estimate that in the early 1780s the urban population of the Pomeranian archdeaconry could have accounted for as much as 1/3 of the population.[62] Of course, we are aware that on the basis of the tables from Rybiński's visitation it is not possible to determine the exact percentage of urban and rural population, but only to give estimates. More specifically, it is useful to provide these estimates for individual deaneries. Figure 8 below, which is based only on the visitation tables, shows the results for the deaneries, but does not include the deanery of Gdańsk and Świecie due to the lack of tables for Gdańsk and Świecie, or Lębork, as the table data for the number of inhabitants of Lębork is inaccurate.

[60] See Szultka, *Studia nad społeczeństwem*, 149.

[61] Not including the residents of the Collegiate City of Chełm for the reasons stated above.

[62] Such a ratio is consistent with Marian Biskup's findings for the late 18th century (*Atlas historyczny Polski. Prusy Królewskie w 2 połowie XVIII wieku* [Instytut Historii Polskiej Akademii Nauk, 1961], 74). He calculated the number of townspeople in the Pomeranian Voivodeship at 62,091 (30.7%). In turn, Szultka's research (*Studia nad społeczeństwem*, 149) shows that the cities of the entire Pomeranian Voivodeship had a population of about 67,800 in 1772. A lower percentage of urban population is given by Szultka (*Studia nad społeczeństwem*, 154) for 1777 for all of West Prussia. Based on data taken from A. F. Büsching's 1790 work, the percentage was then said to be 22.2%. On the other hand, Kędelski ("Ludność Pomorza Nadwiślańskiego," 10) based on Prussian historical tables from 1774, calculated the entire urban population of Royal Prussia occupied after the first partition (and thus excluding Gdańsk and Toruń) at about 18%.

Figure 6. Ratio of urban and rural population by deanery, based on tables from 1780–1781



Source: as in Figure 2.

Based on Rybiński's tables, it can be assumed that the largest rural population lived in the parishes in the Mirachowo deanery, followed by the Nowe and Gniew deaneries. At the other extreme was the deanery of Fordon, where only just over 64% of the population lived in rural areas. However, in the case of Fordon, the percentage of the urban population is probably somewhat overestimated due to a lack of data. By 1745, there were 524 people taking holy communion there,[63] so 35 years later the number could have been even slightly higher, with the addition of children and non-Catholics, who were not included in the 1745 data. On the other hand, the deanery of Fordon included two towns, Fordon and Koronowo, which actually contributed to a higher percentage of townspeople in the deanery. In the case of the deanery of Tczew, although it also included a second town, Skarszewy, the proportions may also have been incorrect. If the overestimation of the population of Tczew alone is accepted, the urban population of this deanery would be 19% instead of almost 36%. In the case of the other deaneries, the ratio of urban to rural population may well have corresponded to the actual figure. The capitals of these ecclesiastical districts were the only cities in their district (except for the deanery of Puck).[64] So the estimated percentage of the population living in the countryside in the visitation tables was probably close to the real figure.

[63] See footnote 35.

[64] Near Puck, the town of Wejherowo also had municipal rights.

Catholics, non-Catholics, and Jews

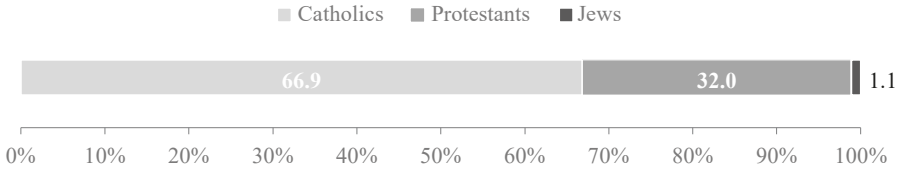
As mentioned at the beginning of the article, the visitors also took into account the religion of the inhabitants in the attached tables, dividing them into Catholics, non-Catholics and Jews. So let us see how the proportions were distributed. Of course, as has already been said, the most reliable data concern Catholics, since the parish priests had the best knowledge of their numbers. The data for non-Catholics and Jews should therefore be treated as estimates.

Table 5. Number of Catholics, Protestants and Jews in the parishes of the archdeaconry, based on tables from 1780–1781

Deanery	Catholics	Non-Catholics	Jews	Total
Bytów	7,035	7,394	96	14,525
Fordon	3,876	1,001	505	5,382
Gdańsk	9,687	2,442	–[65]	12,129
Gniew	8,569	3,113	54	11,736
Lębork	874	2,434	50	3,358
Mirachowo	11,658	2,598	22	14,278
Nowe	8,085	2,984	150	11,219
Puck	8,666	1,787	45	10,498
Starogard	8,729	3,076	140	11,945
Świecie	10,465	5,390	30	15,885
Tczew	9,875	9,720	350	19,945
Total	87,519	41,939	1,442	130,900

Source: as in Figure 2.

Figure 7. Percentage of the population of the Pomeranian archdeaconry by religion based on Bishop Rybiński's tables from 1780–1781



Source: as in Figure 2.

[65] It should be noted, however, that at the end of the 18th century Jews also resided in Chełm (Stolzenberg) and Wrzeszcz, but these towns are missing from the tables of Bishop Rybiński's visitation. See Michał Szulc, "Żydzi w Chełmie do 1814 roku," in *Historie gdańskich dzielnic*, 212–225.

Catholics predominated throughout the archdeaconry, accounting for almost 67% of those included in the tables, with 32% non-Catholic and just over 1% Jewish. The situation for the whole archdeaconry is shown in Figure 7.

It is safe to conclude that the results from Bishop Rybiński's tables are not reliable in the case of religious affiliation. We have already mentioned that while parish priests, who were the main source of information for the recorders, were expected to have a reasonably good and complete knowledge of the number of their own parishioners, in the case of non-Catholics and especially Jews their knowledge was probably very general. In the case of the Jewish population, for example, it is known that before the partitions they were not allowed to settle in the towns of Royal Prussia,[66] but after the first partition, Prussian legislation was in force in the occupied territories, allowing Jews to settle in towns under certain conditions. According to the findings of A. Groth, based on the Prussian statistics of 1777[67] and visitation records, Jews lived in all the towns of the archdeaconry.[68] On the other hand, in his report to Rome on the state of the diocese in 1781, Bishop Rybiński recorded that there were 210,911 Catholics (64.8%), 109,112 non-Catholics (33.5%) and 5,385 Jews (1.7%) in the whole diocese.[69] These figures for the diocese as a whole are fairly consistent with those we have calculated for the Pomeranian archdeaconry.

The question of the distribution of the population in the individual deaneries of the archdeaconry, taking into account the criterion of religion, becomes obvious. As it turns out, even incomplete data concerning at least the deaneries of Lębork and Bytów show some obvious correlations.

The proportions of the population broken down by religion were not evenly distributed within the archdeaconry, which is quite obvious and understandable. The largest number of Catholics lived in the Kashubian deaneries of Puck (82.5%) and Mirachowo (almost 82%). An unexpectedly large number of Catholics lived in the parishes of the Gdańsk deanery (almost 80%). In the tables, however,

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[66] Hence, probably, the large number of Jews recorded in Fordon, which lay within the Inowrocław voivodeship, and thus outside Royal Prussia.

[67] Groth, "Małe miasta pomorskie w 1777 roku," 66–67; Groth, "Małe miasta pomorskie w latach 1772–1806," 62.

[68] At this point it is important to rectify errors that appear in the historical literature. Bolesław Kumor ("Granice metropolii i diecezji polskich [966–1939] [c.d.]," *Archiwa, Biblioteki i Muzea Kościelne* 19 [1969]: 303 [98]) in describing the boundaries of the Włocławek diocese, stated that in 1768 it had 160,988 Catholics, 126,155 Protestants and 1,535 Jews. Meanwhile, Bishop Ostrowski's account, sent to Rome in 1769, mentions 1,535 Jewish families (see *Monumenta historica dioeceseos Wladislaviensis*, vol. 9 [Vladislaviae, 1889], 8; compare *Statuta synodalia dioecesis Wladislaviensis et Pomeraniae*, col. et ed. Zeno Chodyński [Varsovaie, 1890], IX). This error was repeated by e.g., Szultka (*Studia nad społeczeństwem*, 140–141), who additionally stated that the figures were for the Pomeranian archdeaconry, while misquoting the title of the Włocławek source edition.

[69] *Monumenta historica dioeceseos Wladislaviensis*, vol. 9, 27.

we have data for rural areas. They do not take into account the territory of Gdańsk and its population, of which we know that the majority were Protestants. Sławomir Kościelak's research shows that in the 1780s there were about 8,500 Catholics living in the city itself, but they made up about 23% of the city's population at that time.[70] Therefore, if the population of the seaside town were also counted, the percentage of Catholics in the entire Gdańsk deanery would be about 37%, and not nearly 80% as shown in the graph.

Non-Catholics, on the other hand, including Lutherans, Calvinists, and Mennonites, were most numerous in the deaneries outside the former Royal Prussia, namely Lębork (72.5%) and Bytów (almost 51%). Almost half of the population of the deanery of Tczew was also Protestant (48.7%). However, if the 3,000 Protestants in the town itself were not counted, as mentioned above, their percentage in the entire Tczew deanery would have fallen to less than 40%, which was still quite a significant number. Jews were few in the visitation tables, but it is noteworthy that their percentage in the Fordon deanery was significant (over 9% of the parish population).[71]

How did the above indicators compare when cities and villages were considered separately? In the cities, non-Catholics predominated, making up almost 60% of the population recorded by Bishop Rybiński's recorders. Catholics made up less than 33% of the population. There was a relatively large Jewish population, 7.7%, but this was mainly due to the influence of the large Jewish community in Fordon. A. Groth's research, on the other hand, shows that in 1777 the percentage of Jews in small Pomeranian towns was 1% in Świecie and Tczew, 1.7% in Nowe, 2.4% in Skarszewy (in 1776), 2.6% in Starogard, 4.1% in Gniew, and 7% each in Kościerzyna and Puck.[72]

In contrast, parishes with a rural center were overwhelmingly Catholic, accounting for 72% of the population, compared to nearly 28% of non-Catholics. The population of the Jewish faith living in rural localities was negligible at 0.1%.

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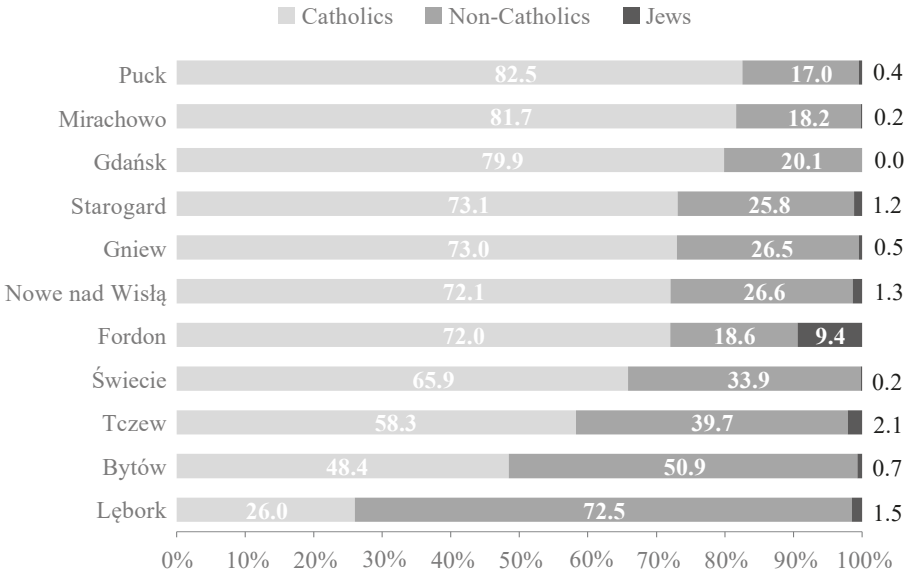
[70] Kościelak, *Katolicy w protestanckim Gdańsku*, 341; Sławomir Kościelak, "Katolicka społeczność Gdańska w świetle ksiąg metrykalnych z drugiej połowy XVIII w. Nowe spojrzenie na przemiany demograficzne w wielowyznaniowym, protestanckim ośrodku," *Przeszłość Demograficzna Polski – Poland's Demographic Past* 40 (2018): 91. This is also confirmed by the research of Barylewska-Szymanska and Maciakowska (*Miasto i ludzie*, 119, 122) for the 1790s. According to these figures, the percentage of Lutherans in Gdańsk was 74.2%, and Calvinists 2.7%. Catholics, on the other hand, were a minority at 23.1%. Added to this were about 2% Mennonites and Jews. Compare Baszanowski, *Przemiany demograficzne w Gdańsku*, 171; Szultka, *Studia nad społeczeństwem*, 141.

[71] According to the tables, 500 people of Jewish descent lived in Fordon town, where they made up more than half of the town's population (ADWł., W43[90]: 443). A further 5 people lived in Koronowo (ADWł., W43[90]: 484).

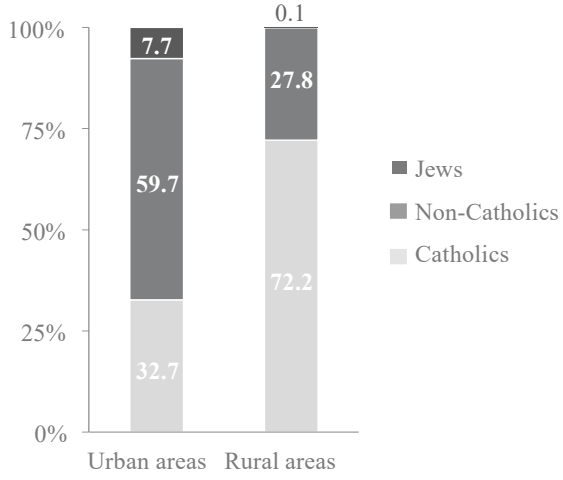
[72] See Groth, *Małe miasta pomorskie w 1777 roku*, 65. We should add that in 1799 the small towns of Pomerania were home to 40.8% Catholics, 53.2% Protestants and 5.8% Jews (Groth, *Małe miasta pomorskie w latach 1772–1806*, 67).

Figure 8. Percentage of Catholics, Protestants and Jews in the deaneries of the Pomeranian archdeaconry based on tables from Bishop Rybiński's visitation (1780–1781)



Source: as in Figure 2.

Figure 9. Percentages of Catholics, non-Catholics and Jews in urban and rural areas as per Bishop Rybiński's tables (1780–1781)

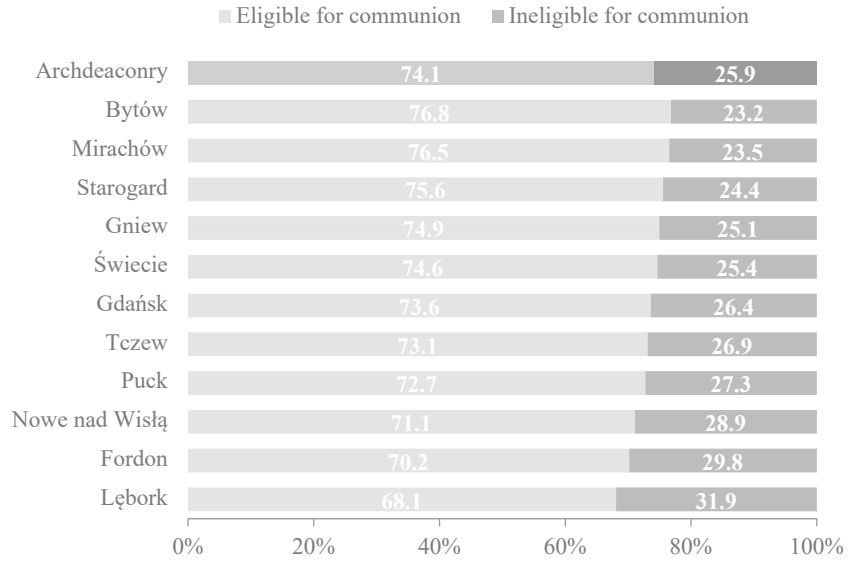


Source: as in Figure 2.

Eligibility and Ineligibility for Holy Communion

In the case of Catholics, the tables distinguished between those who were eligible for communion and those who were not, in other words, adults and children. However, it should also be taken into account that among the non-communicants, the parish priests may have simply counted those who did not receive communion not so much because of their immature age, but for other reasons. Let us first analyze these proportions in each deanery. This is shown graphically in Figure 10.

Figure 10. Those eligible and ineligible for communion in Bishop Rybiński's tables from 1780–1781 (by deanery)



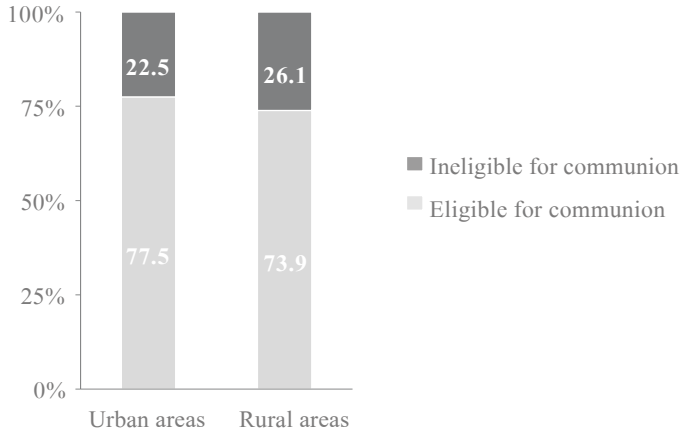
Source: as in Figure 2.

The percentage of those ineligible for communion averaged just under 26% in the entire archdeaconry. Viewed through the prism of the deaneries, the largest number of non-communicants was in the Lębork deanery (almost 32%), and the smallest in the Bytów deanery, at 23.2%. The disproportions were not too great, because excluding the Lębork deanery, sparsely populated by Catholics, the difference would have been only about 6.6%.[73]

[73] Children ineligible for communion accounted for 23.2% in the Bytów deanery and 29.8% in the Fordon deanery.

What is the situation if we consider parishes with a center in the city and parishes with a center in the countryside? This is shown in the following graphs.

Figure 11. Percentage of those eligible and ineligible for communion in parishes with a church in the city and in the countryside according to Bishop Rybiński's tables from 1780–1781



Source: as in Figure 2.

The graph shows that urban parishes had a slightly lower percentage of children than rural parishes. Looking only at cities, the highest number of non-communicants was recorded in Koronowo (about 35% of the Catholic community in the town).[74] At the other extreme was Tczew, where non-communicants were about 8%.[75] The average for all the towns in the archdeaconry was 22.5%. It should be noted, however, that in many cases the figures for the towns appear to be estimates. In Starogard, for example, the recorder reported that there were 900 Catholics, of whom 700 received communion.[76] Also suspicious are the numbers given for Gniew[77] and Nowe.[78] In both cases the number of non-communicants was given as 100. In Bytów, on the other hand, the figure was 10.[79]

[74] See ADWł., W43(90): 484.
[75] See ADPel., G70: 197–197v, 212v–213.
[76] See ADPel., G70: 249–249v.
[77] ADPel., G71: 83a.
[78] ADPel., G71: 250a.
[79] ADPel., G69: 5a.

The larger differences in the percentage of non-communicants are found in the countryside. Figure 11 shows that in general the percentage of the Catholic population not yet receiving communion was 3.6% higher than in urban areas. In analyzing these figures for villages, we will consider only those villages with more than 100 Catholic inhabitants. Among the 268 villages, non-communicants accounted for an average of 26.2% of Catholics, so the percentages are almost identical if smaller settlements are included. At one extreme is the parish town of Subkowy, where communicants made up only 35.7% of all Catholics.[80] The percentage of communicants was similarly high in the village of Płochocin (41.3% eligible for communion).[81] However, it is not known whether the results so significantly different from the average are correct. It may indeed be that the parish priest's data indicated that a significant percentage of parishioners did not receive communion, but then perhaps adults would also be included in this group. At the other extreme are a number of localities where the percentage of communicants exceeded 90%. The highest number of such cases was in Gołębiewo Wielkie (parish of Godziszewo, deanery of Tczew), as high as 96.4%.[82] In the parish of Łąki Polskie (deanery of Świecie) 95% were communicants[83] along with Tępcz (parish of Strzepcz, deanery of Mirachowo).[84] In these and similar cases, it can be assumed that the parish priest only announced the number of adults, from whom he selected those who were eligible for communion because of their age, but did not do so for other reasons. However, it is impossible to say for certain what was actually done in each case.

The records of Bishop Rybiński's visitation, which include tables detailing the population of each parish, are a unique source of knowledge about the population of the Pomeranian archdeaconry in the early 1780s. By analyzing the information contained in the tables, it was possible to determine the approximate population of the parishes of the archdeaconry in the late 1770s and early 1780s, also taking into account the division into towns and villages. This is not perfect data, however. It certainly reflects the number of Catholics more accurately than the number of Protestants and Jews. Nor does it accurately reflect the urban and partly rural population, as some tables are missing.

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[80] The table clearly records that there were 230 Catholics eligible for communion in the parish, while a total of 645 people of the Catholic faith lived there (ADPel., G70: 41a).

[81] Out of 247 Catholics, 102 were communicants (ADPel., G71: 311a, 317).

[82] There were allegedly 106 out of 110 communicants (ADPel., G70: 76a).

[83] Out of 100 people, 95 were said to be receiving communion, but these numbers seem unreliable due to rounding (see ADWł., W43[90]: 32).

[84] A total of 120 Catholics were said to live in Tepcz, 114 of whom received communion (see ADPel., G69: 170a).

In summary, the research presented here shows that the area of the Pomeranian archdeaconry was inhabited by just over 130,000 people. This number was undoubtedly higher, as there are no surviving tables for several parishes, including the largest city of the Republic at that time, Gdańsk. Taking into account estimates known from other sources, it can be assumed that the population of the archdeaconry was at least about 170,000, of whom probably about 55–56,000 lived in towns, mainly in Gdańsk, which had about 37,000 inhabitants at that time. The percentage of the population living in cities varied from one deaconry to another; according to the tables, it ranged from about 3% in the deaconry of Mirachowo to as many as 35–39% in Lębork and Fordon. In this case, however, it is necessary to take into account the lack of more precise information on the entire population of these deaneries (Protestants in Lębork and inhabitants of two rural parishes in the Fordon deanery). Undoubtedly, if Gdańsk were included, the percentage of the urban population would be highest in the Gdańsk deanery. The average Pomeranian village had about 85 inhabitants, but many of the settlements mentioned by the recorders were colonies, hamlets, mills and even single houses with a few or a dozen people. On the other hand, if we analyze the number of inhabitants by religion, we can conclude that Catholics would have made up about 67% of the total population of the archdeaconry, Protestants about 32%, and Jews about 1%. However, the actual proportions were probably more favorable to the Protestant population, since the priests of Catholic parishes were understandably more familiar with the number of Catholics. In addition, as mentioned above, no tables have survived primarily for Protestant-populated Gdańsk. Undoubtedly, however, the countryside remained predominantly Catholic, especially in the "Kashubian" deaneries of Puck and Mirachowo. Outlying areas, such as the deaneries of Lębork and to a lesser extent Bytów, were predominantly Protestant. In the cities and towns (excluding Gdańsk and Hel, which is located on its territory), Catholics made up about 60% of the population. Bishop Rybiński's tables also allow us to determine the percentage of people who were eligible for communion. To simplify, we can assume that in this case they determined the proportion between adults and young children. It should be remembered, however, that among those ineligible for communion there may also have been those who did not receive it for other reasons. On average, the number of those ineligible for communion was about 26%, with a higher percentage in rural parishes (over 26%) and a lower percentage in urban parishes (22.5%).

It should be concluded that studies of population numbers based on Old Polish canonical visitation data require careful analysis of the source records. For the 18th century, when more precise information appears in the visitations, this data is probably much closer to reality than the numbers of parishioners given in the visitation records of previous centuries. A more accurate summary

of the number of parishioners in tabular form, as recorded in such sources of ecclesiastical provenance from the mid-18th century onward, is a valuable addition to the knowledge of the population living in individual parishes. The value of these materials increases even more when the recorders, drawing on the data of the parish authorities, supplement the population information with additional criteria, such as the detailed population of individual villages and towns in a given parish, taking into account, for example, administrative divisions, the owner of the village, the religion or denomination of the parishioners, as well as the eligibility for communion or not. This information provides a more insightful and comprehensive view of the population status of the parishes, archdeaconries, or entire dioceses under study.

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Sygn. [Ref.] G1a: *Visitatio per totum Pomeraniae Archidiaconatum, qui rurales decanatus habet decem, ex voluntate Rmi ... Hieronymi Comitis a Rozdrazow, Dei gratia episcopi Vladislaviensis et Pomeraniae, per Sebastianum Liwierzki SRP capellanum ... facta. 1583–1598*.

Sygn. G1b: *Visitationes Archidiakonatus Pomeraniae sub (...) Hieronymi Rozdrazewski Episcipo Vladislaviensis tam per ipsumet Illmi Episcopum quam per visitatores ab eodem destinatos factae ex libro originali in Archivo Capituli Cathedralis asservato omissa tantummodo supellectili eodem fideliter transumptae. Cura (...) Cypriani Casimiri de Komorze Wolicki Dei et Apostolicae Sedis gratia Episcopi Sinopensis (...) pro usu Venerabilis Consistorii Gedanensis et comoditate Dioecesis Pomeraniae Anno 1767.*

Sygn. G11: *Visitatio Ecclesiarum Pomeraniae subIllmo Nicolao Alberto Gniewosz episcopo Vladislaviensi et Pomeraniae A.D. 1649 peracta*.

Sygn. G20a: *Visitatio Archidiaconatus Pomeraniae sub felicissimis auspiciisIllustrissimi et (...) Bonaventurae de Niedielsko Madaliński Dei et Apostolicae Sedis gratia Episcopi Vladislaviensis et Pomeraniae a (...) Andrea Albinowski Archidiacono Pomeraniae, Cantore Premisliensi, Praeposito Volboriensi Anno 1686 et 1687 peracta*.

Sygn. G20b (doublet G20a): *Visitatio Archidiaconatus Pomeraniae sub felicissimis auspiciis (...) Bonaventurae de Niedzielsko Madaliński, Dei et Apostolicae Sedis gratia Episcopi Vladislaviensis et Pomeraniae a (...) Andrea Albinowski, Archidiacono Pomeraniae, Cantore Premisliensi, Praeposito Volboriensi Anno 1686 et 1687 peracta*.

Sygn. G24: *Acta Visitationis (...) Christophori Antonii de Słupow Szembek I.U.D, archidiaconi Pomeraniae, officialis Gedanesis ac per Pomeraniam generalis Anno 1701 et 1702 expeditae*;

Sygn. G25: *Visitatio (...) Christophori Antonii Szembek Archidiaconi Pomeraniae 1702*.

Sygn. G26: *Archidiaconatus Pomeraniae sub auspiciis (...) Constantini Feliciani de Szaniawy Szaniawski Episcopi Vladislaviensis et Pomeraniae per Joannem Casimirum Jugowski, Archidiaconum Pomeraniae visitatus A.D. 1710 et A.D. 1711.*

Sygn. G40: *Visitatio nonnullarum ecclesiarum in archidiaconatu Pomeraniae sitarum, per (...) Josephum Ignatium Narzymski archidiaconum Pomeraniae, in anno 1728 et 1729 peracta*.

Sygn. G56: *Visitatio per (...) Augustinum Kliński, Archidiaconum Pomeraniae in Anno 1746 expedita [1745–1750].*

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Sygn. G62: *Visitatio Ecclesiarum Decanatus Svecensis in Archidiaconatu Pomeraniae consistentium per ipsummet (...) Antonium Casimirum de Ostrow Ostrowski episcopum Vladisl. et Pomeraniae ... /et/ per (...) Lucam Płachecki canonicum Lublinensem, praepositum Iunivladislaviensem peracta et expedita A.D.1766*.

Sygn. G63a: *Visitatio generalis decanatuum Pucensis et Leoburgensis, Mirachoviensis et Büttoviensis in dioecesis Pomerana consistentum sub felici regimine (...) Antoni Casimiri de Ostrow Ostrowski episcopi Vladisl. et Pomeraniae, officialatu vero (...) Cypriani Casimiri de Komorze Wolicki suffraganei Pomeraniae, vicarii in spiritualibus generalis ac parochi Gedanensis per me Bazilium Złocki Archidiaconi Pomeraniae (...) visitatorem generalem expedita A.D. 1766*.

Sygn. G63b: *Visitatio Generalis /Ostraviana/ decanatuum Pucensis et Leoburgensis, Mirachoviensis et Büttoviensis in Dioecesi Pomerana consistentium per me Basilium Złocki Archidiaconum Pomeraniae, praepositum Skarszeviensem, visitatorem generalem expedita A.D. 1766*.

Sygn. G69: *Visitatio generalis Ecclesiarum decanatuum Buttoviensis, Leoburgensis et Mirachoviensis ex mandato (...) Josephi Rybiński episcopi loci-ordinarii Vladislaviensis et Pomeraniae per (...) /Joannem Josephum/ Gręca decanum praepositum Pucensem, praedictorem decanatuum ecclesiarum visitatorem generalem deputatum expedita anno 1780*.

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Towns and Villages of the Pomeranian Archdeaconry, 1780–1781: Population and Religion

Summary

Within the structure of Wloclawek Diocese, the Pomeranian archdeaconry occupied an important place. Its characteristics are known from the records of canonical visitations. The first descriptions of the visitations to the archdeaconry come from the end of the 16th century and are associated with the figure of Bishop Hieronim Rozdrażewski. Subsequent reports concern the visitations of the years 1686–1687 (by Bishop Bernard Madaliński), 1702–1703 (by Archdeacon Krzysztof Szembek), 1710–1711 (by Bishop Konstanty Feliks Szaniawski), 1728–1729 (by Archdeacon Józef Narzymski), 1745–1750 (by Archdeacon Augustyn Kliński), and 1765–1766 (by Bishop Kazimierz Ostrowski). The visitation of Bishop Józef Rybiński in 1780–1781 was particularly well documented. The vast majority of the visitation records (92.5%) were accompanied by detailed population tables prepared according to a single formula. At that time the Pomeranian archdeaconry consisted of 11 deaneries: Bytów, Fordon, Gdańsk, Gniew, Lębork, Mirachowo, Nowe, Puck, Starogard, Świecie and Tczew. They had a total of 93 parishes; the largest was the Świecie deanery with 14 parishes, and the smallest was the Bytów deanery with 6 parishes. The archdeaconry had a population of just over 130,000 people; the largest number lived in the Tczew deanery (19,945) and the smallest in the Lębork deanery (3,358). The archdeaconry had a total of 14 urban centers; with the exception of Gdańsk, these were towns with a population of about 1,000. They were inhabited by 17,644 people, or 13.4% of the total. The number of villages was 1,335, the total population was 113,348,

and the average village had 85 inhabitants. In terms of denomination, the population was divided as follows: 87,519 Catholics, 41,939 Protestants, and 1,442 Jews. The largest number of Catholics lived in the "Kashubian" deaneries (Puck and Mirachowo); there were also many in the rural parishes of the Gdańsk deanery. Protestants, on the other hand, dominated the decans outside the former Royal Prussia (Lębork and Bytów). The Jewish population was sparse; a large percentage of it was found only in the Fordon deanery (9.4%). Among the Catholics of the archdeaconry, the percentage of those who were ineligible for communion, mainly because were too young, was almost 26%; the highest number was found in the deanery of Lębork (31.9%), and the lowest in the deanery of Bytów (23.2%).

Wsie i miasteczka w archidiakonacie pomorskim w latach 1780–1781. Ludność i religia

Streszczenie

W strukturze diecezji włocławskiej ważne miejsce zajmował archidiakonat pomorski. Z jego charakterystyką można się zapoznać dzięki aktom wizytacji kanonicznych. Pierwsze opisy wizytacji tego archidiakonatu pochodzą z końca XVI stulecia i związane są z postacią biskupa Hieronima Rozdrażewskiego. Kolejne sprawozdania dotyczą wizytacji z lat: 1686–1687 (bpa Bernarda Madalińskiego), 1702–1703 (archidiakona Krzysztofa Szembeka), 1710–1711 (bpa Konstantego Feliksa Szaniawskiego), 1728–1729 (archidiakona Józefa Narzymskiego), 1745–1750 (archidiakona Augustyna Klińskiego) i 1765–1766 (bpa Kazimierza Ostrowskiego). Szczególnie bogatą dokumentację pozostawiła wizytacja bpa Józefa Rybińskiego z lat 1780–1781. Zdecydowana większość protokołów wizytacyjnych (92,5%) została zaopatrzona w szczegółowe tabele dotyczące ludności, sporządzone według jednego wzoru. W omawianym okresie archidiakonat pomorski tworzyło 11 dekanatów: Bytów, Fordon, Gdańsk, Gniew, Lębork, Mirachowo, Nowe, Puck, Starogard, Świecie i Tczew. Liczyły one łącznie 93 parafie; największy był dekanat świecki z 14 parafiami, a najmniejszy bytowski z 6 parafiami. Archidiakonat zamieszkiwało nieco ponad 130 tys. osób; najwięcej żyło w dekanacie tczewskim (19 945), a najmniej w lęborskim (3 358). Ogółem na terenie archidiakonatu funkcjonowało 14 ośrodków miejskich; z wyjątkiem Gdańska były to miasteczka liczące w większości ok. 1 000 mieszkańców. Zamieszkiwały je 17 644 osoby, czyli 13,4% ogółu. Liczbę wsi określano na 1 335; mieszkało tam łącznie 113 348 osób, a przeciętna wieś liczyła 85 osób. Pod względem konfesji wśród mieszkańców wyróżniano: 87 519 katolików, 41 939 protestantów i 1 442 Żydów. Najwięcej katolików zamieszkiwało dekanaty „kaszubskie" (pucki i mirachowski); dużo było ich również w parafiach wiejskich dekanatu gdańskiego. Protestanci dominowali z kolei

w dekanatach poza dawnymi Prusami Królewskimi (lęborski i bytowski). Ludność żydowska była nieliczna; duży jej odsetek występował tylko w dekanacie fordońskim (9,4%). Wśród katolików archidiakonatu odsetek osób niezdolnych do komunii, głównie z racji niedojrzałego wieku, wynosił niemal 26%; najwięcej było ich w dekanacie lęborskim (31,9%), a najmniej w bytowskim (23,2%).

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Family Composition of Samogitian Peasants and *Odnodvortsy* Based on Mid-19th Century Inventories

Rodziny chłopów i jednodworców na Żmudzi według inwentarzy z połowy XIX wieku

Abstract

The article analyzes the composition of peasant and *odnodvortsy* family households in mid-19th-century Samogitia (Raseiniai, Šiauliai and Telšiai districts), based on data from the 1845–1856 Imperial Russian state-owned estate inventories. Using Laslett and Hammel's (1974) typology, widely used in historical demography, families were classified as solitaries, no family, nuclear, extended and multiple-family households. In order to identify the factors that determined family composition, families were classified based on their social category (peasant or *odnodvortsy* families) as well as their economic status (*tyaglye* (serfs), *polutyaglye* (semi-indentured laborers), *ogrodniki* (plot-holders) and *bobyl'i* (landless people)). The empirical analysis showed that families of both social categories and

Abstrakt

W artykule omówiono skład gospodarstw domowych chłopów i jednodworców na Żmudzi w połowie XIX w. (powiaty rosieński, szawelski i telszewski) na podstawie danych inwentarzy dóbr państwowych Imperium Rosyjskiego z lat 1845–1856. Korzystając z typologii Lasletta-Hammela (1974), dobrze ugruntowanej w demografii historycznej, rodziny zostały sklasyfikowane jako gospodarstwa osób samotnych, gospodarstwa nierodzinne, rodziny nuklearne, rozszerzone i złożone. Aby zidentyfikować czynniki, które determinowały skład, rodziny zostały podzielone według kategorii społecznej (chłopi i jednodworcy), a także według statusu majątkowego (ludzie ciągli, ludzie piesi, ogrodniki [zagrodnicy] i komornicy). Analiza empiryczna pokazała, że rodziny należące do obu kategorii

all the economic categories tended to have a nuclear structure, except for the serf peasants and semi-indentured peasants, among whom there was no single dominant family type. The distinguishing feature of these social categories was determined by having a sufficient amount of land for self-sustenance and the living conditions associated with serfdom.

społecznych i wszystkich kategorii ekonomicznych miały raczej strukturę nuklearną, z wyjątkiem chłopów ciągłych i pieszych, wśród których nie było jednego dominującego typu rodziny. Wyjątkowość tych kategorii społecznych wynikała z posiadania wystarczającej do przeżycia ilości ziemi i życia w warunkach pańszczyźnianych.

Keywords

Family, household, mid-19th-century Samogitia, historical demography

Słowa kluczowe

rodzina, gospodarstwo domowe, Żmudź połowy XIX w., demografia historyczna

Introduction

The study of families and the varieties of household composition in the past and the socioeconomic and demographic factors that determined them is still very new and uncommon in Lithuanian historiography, although research of this kind was increasing in Western Europe by the mid-20th century, when John Hajnal[1] and Peter Laslett[2] published their theories on the distribution of family types in Europe. We can consider the works of ethnologist Angelė Vyšniauskaitė[3] as pioneering in the field of household research in Lithuania; she showed that in the past, nuclear family structures dominated in Lithuania's territory, although in the 18th and 19th centuries there started to be more multiple-family households. More recent studies by Lithuania's historians and sociologists have revealed that in the late 18th century, it was common for unmarried relatives and elderly parents to live together with the nuclear family,[4] while in the mid-19th century in the provinces

[1] John Hajnal, "European Marriage Patterns in Perspective," in *Population in History: Essays in Historical Demography*, vol. 1, *General and Great Britain*, ed. David Edward Charles Eversley (Edward Arnold, 1965), 101–143.

[2] Peter Laslett, "Introduction: The History of the Family," in *Household and Family in Past Time*, ed. Peter Laslett (Cambridge University Press, 1974), 1–90.

[3] Angele Višnâuskajte, *Razvitie litovskoj krestânskoj sem'i* (Nauka, 1964) [Ангеле Вишняускайте, *Развитие литовской крестянской семьи*]; Angelė Vyšniauskaitė, "Valstiečių šeimos demografiniai bruožai ir organizacija XVIII–XX a. I pusėje," in *Lietuvių šeima ir papročiai,* ed. Angelė Vyšniauskaitė, Petras Kalnius and Rasa Paukštytė (Mintis, 2008), 123–189.

[4] Jolita Sarcevičienė, "Cykle życia jednostki i rodziny: na przykładzie chłopów litewskich w XVIII wieku," in *Grupy społeczne i ich wpływ na rozwój społeczeństwa w XVI–XIX wieku*, ed. Tamara Bairašauskaitė (Lietuvos istorijos instituto leidykla, 2015), 49–66.

of Kaunas and Vilnius there was no dominant peasant family or household model,[5] which indicates that Lithuania should be classified as a transitional cultural zone where a significant portion of all households consisted of both nuclear and multiple-family households. The conclusions of this research lead us to question Hajnal's theory, based on which it is claimed that the multiple-family household was dominant in the territory of ethnic Lithuania, characteristic of all of Eastern Europe[6] and encourages us to pay closer attention to those studies that attempt to reveal the variety of family types and the determining factors for this variety in specific regions.[7] Hypothetically, it can be claimed that the economic status and belonging to a particular estate influenced the composition of a family; therefore, the aim of this article is to analyze the data in the inventories of Imperial Russian state-owned estates, to answer the question: What role did the population's economic and social status play in the composition of the family?

The empirical basis for this paper is the database on peasant and *odnodvortsy* (literally, individual farmers who used to be petty nobles) families, which was created by selecting data from state-owned estate inventories kept in the Lithuanian State Historical Archives (col. 525, inv. 2). State-owned estate inventories were chosen because in these inventories, data on the population was collected according to a typical form: the abundance of sources for the easy selection and grouping of data. In the inventories, the population was classified according to the amount of land at their disposal serfs (тяглые, *tyaglye*), semi-indentured laborers (полутяглые, *polutyaglye*), plot-holders (*огородники*, *ogrodniki*) and landless people (бобыли, *bobyl'i*). In addition to peasant families, these inventories also enumerated *odnodvortsy* families, which made it possible to compare the structure of households not only according to their economic status, but also to their social category. For the purposes of this article, Samogitia is taken to be the districts of Raseiniai, Šiauliai and Telšiai, which belonged to the Kaunas Province from 1843. The collected

[5] Aušra Maslauskaitė, Dalia Leinartė and Irma Dirsytė, "Praeities šeimos: ar XIX a. vidurio Lietuvai buvo būdinga vakarietiška namų ūkio struktūra?" *Sociologija. Mintis ir veiksmas* 49, no. 1 (2021): 7–33.

[6] Hajnal, "European Marriage Patterns in Perspective," 101–43.

[7] Andrejs Plakans, "Family Enterprise in the Baltic Estate Economy: The Nineteenth Century," *The History of the Family* 6, no. 1 (2001): 241–256; Andrejs Plakans, "Migration, Households, and Agrarian Reform in the Baltic Province of Russia: 19th and 20th Centuries," *The History of the Family* 11, no. 1 (2006): 151–59; Tracy Dennison, "Household Formation, Institutions, and Economic Development: Evidence from Imperial Russia," *The History of the Family* 16, no. 1 (2012): 456–65; Péter Őri, "Long-term demographic change and local socio-cultural patterns: marriages and household structure in 18th–20th-century Hungary," *Przeszłość demograficzna Polski* 37, no. 3 (2015): 7–37; Mikołaj Szołtysek, "Central European Household and Family Systems and the 'Hajnals-Mitterauer' Line: The Parish of Bujakow (18th–19th Centuries)," *The History of the Family* 12, no. 1 (2007): 19–40; Mikołaj Szołtysek, *Rethinking East-Central Europe: Family Systems and Co-residence in the Polish-Lithuanian Commonwealth,* vol. 1, *Contexts and Analyses* (Peter Lang, 2015).

empirical data on the composition of peasant and *odnodvortsy* families that lived in Samogitia was analyzed for the first time in Lithuanian historiography. It should be noted that data from part of the territory of the Šiauliai District was included in studies by J. Sarcevičienė[8] and A. Maslauskaitė.[9]

The Use of State-Owned Estate Inventories in Family Structure Research: Advantages and Shortcomings

The compilation of inventories of Imperial Russian state-owned estates can be associated with the state peasant reforms of 1837–1841 instituted by Pavel Kiselyov, the Imperial Russian Minister of State Property, which sought to improve the material situation of the peasantry and increase the peasantry's trust in the Imperial Russian government, by equalizing the management and dues of state peasants in the western provinces, replacing *corvée* with *Zins*, strengthening the legal status of state peasants with respect to their body and property, yet still leaving them enserfed.[10] When researching family composition, it is important to first evaluate the sources from which data is to be collected, as the quality of this data will depend on how informative the sources are. Before collecting the data, the most important thing is to determine the units (households, families, single individuals, etc.) in which the population was enumerated, how accurately a person's estate, or class, was indicated (noble, freeman, peasant, etc.), and how comprehensively the social status and kinship to the head of the family was indicated (husband, wife, son, daughter, hired hand, *kampininkas (kątnik, komornik)* etc.). In order to determine the advantages and shortcomings of inventories for this research of family composition, other sources containing a similar record of the population should be compared to these inventories, taking into account the above-mentioned criteria. In Samogitia in the mid-19th century, in addition to compulsory inventories, the population was also enumerated in lists of parishioners and in Imperial Russian *revizii,* or tax censuses. In state-owned estate inventories, people were enumerated by household, or yard (*двора, dvora*), with landless peasant entered separately though usually with an indication of with whom they lived. In censuses, on the other hand, people were enumerated according to families (*семьи, semi'i*), while in lists of parishioners and in the Fifth Census, by house/dym (*dymy*, single production and consumption units). It should be noted, however, that in the inventories

[8] Sarcevičienė, "Cykle życia jednostki," 49–66.

[9] Maslauskaitė, Leinartė and Dirsytė, "Praeities šeimos," 7–33.

[10] Konstantinas Jablonskis and Juozas Jurginis, *Lietuvos valstiečiai XIX amžiuje* (Valstybinė politinės ir mokslinės literatūros leidykla, 1957), 43.

of state-owned estates, as well as in the censuses, the population was in fact most often enumerated in families, since next to each inhabitant of a yard/house there was a note indicating their kinship to the head of the family. The kinds of relationships to the head of the household found in the inventories included nephew (*племянник, plemyanik*), relative (*родственник, rodstvenik*), brother-in-law (*шурин, shurin*), son-in-law (*зять, zyat'*), cousin (male) (*двоюродный брат, dvoyurodni'i brat*), and cousin (female) (*двоюродная сестра, dvoyurodnaya sestra*). The inventories always indicated if a recorded individual was an illegitimate child (born out of wedlock) (*незаконнорожденный, nezakonnorozhdenni'i*). These terms were also quite common in censuses, but they are rarely found in parish registers. However, it was not always the case that only relatives would be recorded as living in one house. Sometimes, the inventories show that in addition to the regular family members, we can also find sharecroppers (*полудомник, poludomnik*), or inhabitants identified as "living together" (*при нем, pri nem*), in some instances, "adoptees" (*приемышъ, priemish*). Even though these terms were rare in the inventories, they do show that in this kind of source, unlike censuses where such terminology was not used, individuals who were not necessarily related were enumerated together with the stem family. For parish registers, on the other hand, the recorders hired help (*służący, parobek, dziewka*) and co-resident lodgers (*kątnicy*) were often found. In inventories, the term "hired hand" (*работник, rabotnik*) was hardly found so it would seem that hired hands were not recorded in the inventories. Conversely, when the place of residence of the landless peasants was recorded, it was sometimes written that they also served/worked there, which would indicate that at least some of the individuals identified as hired hands or lodgers in lists of parishioners were called *bobyl'i* in the inventories. Both the similarity of the terms used, and the references to census lists found in the inventories indicate that census material was used prior to the compilation of inventories of state-owned estates. It should be noted that it is possible for censuses to record the legal residence of an individual when that person actually resided elsewhere,[11] so this information may also have found its way into the inventories. For example, if adult children were recorded in a census as living with their parents, they were not necessarily still living with their parents. On the other hand, the inventories, especially in regard to *bobyl'i* indicated where the individual lived at the time of the census, and where they lived at the time of the inventory, so we should assume information about the population was usually checked when compiling the inventories.

[11] Vladimir Maksimovič Kabuzan, *Narodonaselenie Rosii v XVIII – pervoj polovine XIX v.* (Akademiâ nauk SSSR, 1963) [Владимир Максимович Кабузан, *Народонаселение Росии в XVIII – первой половине XIX в.*], 77.

The purpose of state-owned estate inventories was to record the enserfed peasants and *odnodvortsy* (petty nobles who could not prove their noble lineage) and their servile labor (corvée) or dues. All the inventories were compiled according to a standard template, which makes them very different from, for example, parish registers, where data on the population was collected differently in each parish. In summary, it can be said that state-owned estate inventories are suitable for the study of family composition because they indicated very clearly and precisely kinship of each individual to the head of the family, along with a precise indication of each family's economic status and membership of a specific social group (peasant/individual farmer). On the other hand, the main shortcoming of state-owned estate inventories is that they do not indicate how many servants there were in a family.

Methodological Approaches Used in the Research, and the Scope and Value of the Data

The body of data used for this analysis was collected from state-owned estate inventories compiled in 1845–1856 and covering the districts of Raseiniai, Šiauliai and Telšiai. In total, 29 inventories were analyzed, producing data on 20,009 individuals belonging to 3,225 families. Around a third of all the inventories kept in col. 525, inv. 2 were selected for this research, which included the above-mentioned district territories so as to achieve as even a coverage of the research area as possible. For this analysis, I selected 11 inventories from the Raseiniai District (Baltmiškis in 1845,[12] Žalpiai in 1845,[13] Nemakščiai in 1853,[14] Viduklė in 1853,[15] Kaltinėnai in 1854,[16] Karklėnai in 1855,[17] Kelmė in 1855,[18] Pajūris in 1855,[19] Raseiniai in 1855,[20] Pagiai in 1856,[21] and Skirsnemunė in 1856),[22] 9 from the Šiauliai District

[12] *Baltmiškis State-Owned Estate Inventory. 1845.* Lithuanian State Historical Archives (henceforth – LVIA), col. 525, inv. 8, file 2591.

[13] *Žalpiai State-Owned Estate Inventory. 1845.* LVIA, col. 525, inv. 2, file 2626.

[14] *Nemakščiai State-Owned Estate Inventory. 1853.* LVIA, col. 525, inv. 2, file 2684.

[15] *Viduklė State-Owned Estate Inventory. 1853.* LVIA, col. 525, inv. 2, file 2595.

[16] *Kaltinėnai State-Owned Estate Inventory. 1854.* LVIA, col. 525, inv. 2, file 2646.

[17] *Karklėnai State-Owned Estate Inventory. 1855.* LVIA, col. 525, inv. 2, file 2636.

[18] *Kelmė State-Owned Estate Inventory. 1855.* LVIA, col. 525, inv. 2, file 3645.

[19] *Pajūris State-Owned Estate Inventory. 1855.* LVIA, col. 525, inv. 2, file 3702.

[20] *Raseiniai State-Owned Estate Inventory. 1855.* LVIA, col. 525, inv. 2, file 2719.

[21] *Pagiai State-Owned Estate Inventory. 1856.* LVIA, col. 525, inv. 2, file 2692.

[22] *Skirsnemunė State-Owned Estate Inventory. 1856.* LVIA, col. 525, inv. 2, file 2748.

(Liubšiai-Vaiguva in 1845,[23] Kolainiai in 1847,[24] Zubriai in 1851,[25] Pagirgždūtis in 1852,[26] Purviai in 1853,[27] Luokė in 1854,[28] Papilė in 1854,[29] Gegužiai in 1854[30] and Pavenčiai in 1855)[31] and 9 from the Telšiai District (Šatės in 1845,[32] Janapolė in 1847,[33] Alsėdžiai in 1849,[34] Pikeliai in 1849,[35] Sledai in 1849,[36] Mažieji Juodeikiai in 1851,[37] Varniai in 1852,[38] Nausėdžiai in 1853[39] and Viešvėnai in 1855).[40] Family data was compiled using MS Excel, based on 9 variables. The data matrix recorded district, place of residence, individuals' first and last names, age, sex, social category, the kinship of household members with the head of the household, family size, and family composition. Data on family composition was collected according to the Hammel-Laslett typology of families, with only minor modifications. This typology is widely used by historians, sociologists, and demographers in their work, so it does not warrant a separate, detailed description here. However, it is important to indicate and justify to which family type the atypical and more complex families found in the inventories were assigned. Although C. Kuklo classified women with illegitimate children as a nuclear household 3e subtype,[41] I decided to assign women with illegitimate children to a separate subtype. Families of this subtype were assigned to the second type of household, which would usually consist of unmarried siblings living together (according to Laslett's subtype 2a) or people related by different kinships (subtype 2b). In this study, women with illegitimate children were classified as subtype 2c because in the absence of marital ties they cannot be considered a nuclear family, but neither can they be considered

[23] *Liubšiai-Vaiguva State-Owned Estate Inventory. 1845.* LVIA, col. 525, inv. 2, file 3900.
[24] *Kolainiai State-Owned Estate Inventory. 1847.* LVIA, col. 525, inv. 2. file 4036.
[25] *Zubriai State-Owned Estate Inventory. 1851.* LVIA, col. 525, inv. 2. file 3850.
[26] *Pagirgždūtis State-Owned Estate Inventory. 1852.* LVIA, col. 525, inv. 2, file 3962.
[27] *Purviai State-Owned Estate Inventory. 1853.* LVIA, col. 525, inv. 2, file 3955.
[28] *Luokė State-Owned Estate Inventory. 1854.* LVIA, col. 525, inv. 2, file 3894.
[29] *Papilė State-Owned Estate Inventory. 1854.* LVIA, col. 525, inv. 2, file 3986.
[30] *Gegužiai State-Owned Estate Inventory. 1854.* LVIA, col. 525, inv. 2, file 3826.
[31] *Pavenčiai State-Owned Estate Inventory. 1855.* LVIA, col. 525, inv. 2, file 3994.
[32] *Šatės State-Owned Estate Inventory. 1845.* LVIA, col. 525, inv. 2, file 3237.
[33] *Janapolė State-Owned Estate Inventory. 1847.* LVIA, col. 525, inv. 2, file 3255.
[34] *Alsėdžiai State-Owned Estate Inventory. 1849.* LVIA, col. 525, inv. 2. file 3146.
[35] *Pikeliai State-Owned Estate Inventory. 1849.* LVIA, col. 525, inv. 2, file 3172.
[36] *Sledai State-Owned Estate Inventory. 1849.* LVIA, col. 525, inv. 2, file 3189.
[37] *Mažieji Juodeikiai State-Owned Estate Inventory. 1851.* LVIA, col. 525, inv. 2, file 3142.
[38] *Varniai State-Owned Estate Inventory. 1852.* LVIA, col. 525, inv. 2, file 3010.
[39] *Nausėdžiai State-Owned Estate Inventory. 1853.* LVIA, col. 525, inv. 2, file 3145.
[40] *Viešvėnai State-Owned Estate Inventory. 1855.* LVIA, col. 525, inv. 2, file 3032.
[41] Cezary Kuklo, *Kobieta samotna w społeczeństwie miejskim u schyłku Rzeczypospolitej szlacheckiej: studium demograficzno-społeczne* (Uniwersytet w Białymstoku, 1998), 75.

a non-family household. Most of the obstacles in the selection and data classification stage emerged when dealing with the multiple-family type. In the inventories there were some cases where married couples identified as relatives (*rodstvenik*) or two pairs of male cousins (and female cousins) lived together. There were also houses where, in addition to the main family, there were also sharecroppers (*poludomnik*), or people identified as "co-residents" (*pri nem*), or sometimes as "adoptee" (*priemish*). All such cases were assigned to subtype 5e, which Laslett classed as "other relatives with families." Of course, this raises the question of whether we should really consider two otherwise unrelated couples living together as one family. In this case, this assignment should be considered as rational, since all these people had common property according to the inventory (cottages, livestock and land) and they had to pay certain dues as one economic unit. Besides, such cases of co-residence were rare and could only be found around Janapolė (Telšiai District), with several more around Raseiniai. Therefore, it would not make sense to separate compounds of this kind into a distinct subtype. It should be noted that when selecting data, there were some cases where it was difficult to assign certain families to a specific type due to a lack of information (it was difficult to determine the kinship because the information provided was unclear, etc.). Such cases were also few in number, which is why I decided not to typologize them (they are not included in the sample).

The largest part of the collected data consisted of enserfed peasant families and landless peasant (*bobyl'i*) families. Meanwhile, people assigned to the semi-indentured peasant laborers, plot-holders and *odnodvortsy* social group (this applied to all enserfed peasants, semi-indentured peasants and plot-holders) made up a minority of the population enumerated in the inventories (see Table 1).

Table 1. Number of peasants and individual farmers in the analyzed inventories

	Number of peasant families									
Settlement	P[a]	%	PusP[b]	%	D[c]	%	B[d]	%	Total	%
1	2	3	4	5	6	7	8	9	10	11
Raseiniai	748	67	39	3	55	5	275	25	1,117	100
Šiauliai	402	62	43	7	26	4	182	28	653	100
Telšiai	830	69	121	10	80	7	174	14	1,205	100
Total	1,980	67	203	7	161	5	631	21	2,975	100

1	2	3	4	5	6	7	8	9	10	11
	Number of *odnodvortsy* families									
Raseiniai	23	47	–	–	1	2	25	51	49	100
Šiauliai	10	22	5	11	3	7	28	61	46	100
Telšiai	30	19	9	6	3	2	113	73	155	100
Total	63	25	14	6	7	3	166	66	250	100

[a] P – tyaglye (prievolininkai, enserfed people).
[b] PusP – polutyaglye (pusiauprievolininkai, semi-indentured people).
[c] D – zagrodnicy (daržininkai, plot-holders).
[d] B – bobyl'i (bobeliai, landless people).

Source: Data from the 1845–1856 Imperial Russian state-owned estate inventories.

According to the distribution of the data, it seems that the enserfed peasant laborers and landless peasants sample was the largest, meaning that the family structure of the population in these groups can be determined with the greatest accuracy because the largest number was included in the research. On the other hand, alhough there were fewer semi-indentured peasants and peasant plot-holder families, it is still possible to track the trend in family composition among these social groups. It is more difficult to research the structure of individual farmer families. There were very few semi-indentured *odnodvortsy* or *odnodvortsy* plot-holders, so it is only possible to research their families in combination with enserfed *odnodvortsy* families. It is possible to track certain trends in the family structure of landless *odnodvortsy* by researching this group separately.

Having collected and differentiated the data on peasant and *odnodvortsy* families, it is equally important to determine the demographic value of this data, i.e., to clarify precisely how babies, children, people of working age and the elderly were counted. In historical demography, it is the accepted norm that babies aged 0–1 should have been less than 4 percent of the population, while children aged 0–14 (including babies) should have been 35–40 percent. The elderly, aged over 65, would have made up more than 2–3 percent of the population.[42] Having calculated how many babies, children, people of working age and seniors there were in the population studied, it became clear that the inventories had significantly undercounted babies and elderly people. Also, when compared to the data found in the historiography, there should have been more children. It should be noted that male babies and children were the least thoroughly recorded, which may have been related to the payment of a poll tax, which had to be paid according to the number of males on the census lists. This, in turn, could be related to attempts to avoid conscription or military service (knowing that these inventories were based on population censuses).

[42] Szołtysek, *Rethinking East-Central Europe*, 842–845.

In addition, it would have been advantageous to show fewer young children and elderly residents as these people would not have paid taxes (see Table 2).

Table 2. Population structure (to determine the value of the data)

Age	Males		Females		Total	
	No.	%	No.	%	No.	%
0–1	109	1	235	2	344	2
0–14	2,624	28	3,359	31	5,983	30
15–64	6,477	69	7,080	66	13,557	68
65<	153	2	162	2	315	2
Undeterm.	84	1	70	1	154	1
Total	9,338	100	10,671	100	20,009	100

Source: Data from the 1845–1856 Imperial Russian state-owned estate inventories.

The data shows that when compiling state-owned estate inventories, the main goal was to record those people of working age who could pay taxes and make contributions, so young children and elderly people who could not work were not considered very important. When interpreting data on family composition, it is very important to take into account data on population structure, because it is quite realistic to think that those married couples that were recorded as childless could in fact have had young children not yet of working age, or could have lived in extended families where, in addition to the married couple, there were still unmarried siblings, or an elderly parent (or both), who were already no longer able to work, and were therefore not included in the inventory. Such cases, unfortunately, mean it is not possible to determine family composition accurately based on the inventories, so there is a likelihood that the results obtained do not reflect what the families actually looked like; on the other hand, some children and elderly people were registed in the inventories, so family composition may not have necessarily been very seriously distorted.

Results of the Data Analysis

The collected data on family types was differentiated according to district, social group and the economic status of the population. The analyzed data revealed that there was no single dominant family type among the enserfed peasant laborers. Nuclear, extended and multiple families each accounted for about a third of all the enserfed peasant laborer family types, while there were almost no unmarried enserfed peasant laborers working the land. The situation was similar in all

districts, except that in the Telšiai District, there were slightly more extended families, while in the Raseiniai and Šiauliai districts there were slightly more multiple families. Meanwhile, the *odnodvortsy* families assigned to the enserfed peasant laborer category differed from the enserfed peasant laborer families proper. In all districts, around 50 percent of the enserfed *odnodvortsy* families were nuclear, while the number of extended and multiple families depended on the district. For example, in the Raseiniai District, of the total enserfed *odnodvortsy* laborer families, 29 percent were extended families and 21 percent were multiple families. But, in the Šiauliai District, extended families made up as much as 39 percent of all families, and only 6 percent were multiple families. In fact, because there were actually so few semi-indentured *odnodvortsy* laborer and *odnodvortsy* plot-holder families (see Table 1), when conducting the analysis they were grouped with the enserfed *odnodvortsy* laborer families, so the calculations may be slightly distorted due to the total low number of *odnodvortsy* families. On the other hand, in the Raseiniai District, all the *odnodvortsy* were enserfed laborers, with only one family assigned to the plot-holder group, but the analysis results basically correlate across all districts, so it can be said that the nuclear family structure was more characteristic among enserfed *odnodvortsy* laborer families than among peasant enserfed laborer families. Meanwhile, peasant semi-indentured laborer families, despite being more similar to peasant enserfed laborer families in their composition, were in fact different, and the dominant family type depended very much on the district. In Raseiniai District, for example, 41 percent of all semi-indentured laborer families were nuclear families. In Šiauliai District, on the other hand, 49 percent of all semi-indentured laborer families were multiple families. In Telšiai District, the majority (42 percent) of semi-indentured laborer families were extended families. Therefore, there was no single dominant family type among semi-indentured laborers and peasant enserfed laborer families, but there were regional similarities. The difference was more pronounced between peasant plot-holder families on the one hand, and peasant enserfed laborer families and peasant semi-indentured laborer families on the other. In all districts, nuclear families were the dominant type among peasant plot-holders, accounting for more than half of all plot-holder families. Around a quarter of all families were extended, while the number of multiple families was even lower. It was noted that among plot-holder families, there was a certain prevalence of umarried or widowed individuals. The greatest number of unmarried plot-holders as high as 23 percent lived in Šiauliai District, while somewhat fewer, 13 percent, lived in Telšiai District. *Bobyl'i* lived in much the same way as plot-holders. Nuclear families were also the most common type among this group of the population, yet the majority of *bobyl'i* lived alone; they were either unmarried or widowed. The family composition of peasant *bobyl'i* and *odnodvortsy bobyl'i* was very similar.

Interpretation of the Results

As we can see, both economic status and social category had an influence on family composition. In the case of peasant enserfed laborers and semi-indentured laborers, we can agree with A. Maslauskaitė and D. Leinartė that, based on the composition of peasant families, Lithuania should be assigned to the transitional cultural zone where there was no single dominant family type, since the population from these categories made up the majority.[43] Peasant enserfed laborers constituted the majority of the population, but *odnodvortsy*, plot-holder and lodger (*komornicy*) families were largely nuclear, which was influenced by the different way of life of the representatives of these social categories. It is evident that the dominance of a particular family structure depended on numerous factors. In the case of the peasant serfs, the link between their family composition and economic status is similar to that of the population of the Perugia area. In Perugia, the families of landless peasants were nuclear and small.[44] M. Kopczyński mentioned that in the Kingdom of Poland the size and complexity of households and families was determined by socioeconomic and wealth status.[45] And since they had either no land, or only a small plot, like the plot-holders, the population was more sensitive to years of bad harvests, and they would then find it more difficult to have enough to eat and would be forced to lodge with and work for other enserfed or semi-indentured laborers. As a result, *bobyl'i* and plot-holders raised fewer children (their mortality was higher), they found it harder to establish families, and so, more of them remained unmarried. It was also more difficult to enter into another marriage after widowhood. This poverty meant that it was harder for *bobyl'i* and plot-holders to make the most of their biological reproductive potential, which makes their family structure more similar to that of urban dwellers.[46] Additionally, the *bobyl'i* group tended to include more women with illegitimate children, which also indicates that poverty may have prevented women in the *bobyl'i* group from marrying even when it was imperative. The inventory material shows that *bobyl'i* were typically in a state of constant migration (usually within the estate domains), living on different farms, which in turn encouraged.

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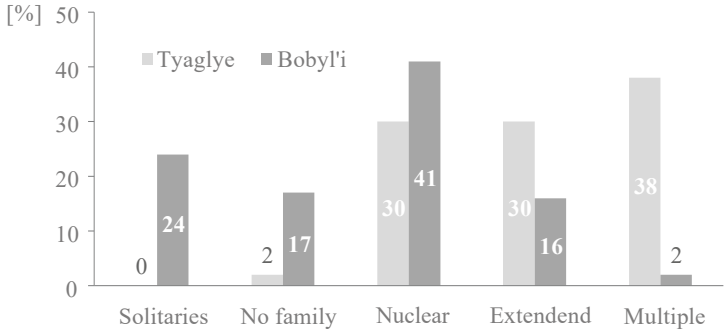
[43] Maslauskaitė, Leinartė and Dirsytė, "Praeities šeimos," 7–33.

[44] David Kerzer and Richard Saller, *The Family in Italy from Antiquity to the Present* (Yale University Press, 1991).

[45] Michał Kopczyński, *Studia nad rodziną chłopską w Koronie w XVII–XVIII wieku* (Wydawnictwo Krupski i S-ka, 1998), 114.

[46] Cezary Kuklo, *The Population of the Holy Cross Parish in Warsaw in the 18th Century* (Institute for Research of European Cultural Heritage, 2016), 85–90.

Figure 1. Comparison of tyaglye and bobyl'i family composition in Šiauliai District



Source: Data from the 1845–1856 Imperial Russian state-owned estate inventories.

Further division of their families. Meanwhile, the enserfed and semi-indentured laborers who had land at their disposal had a greater need for labor, which is why other, even more distant, relatives with their families stayed and lived together; living with relatives who had land would have made it easier to secure enough food, while the living conditions of serfs limited their opportunities to migrate outside of the estate's boundaries, just as there were only limited opportunities to establish separate farms. *Odnodvortsy*, on the other hand, tended to live in nuclear families, because they had once been lesser nobles who were able to migrate freely, enter the service of estate owners or rent peasant-type farms. This lifestyle encouraged families to eventually disperse, with brothers and more distant relatives rarely staying on to live together with the main family.

Conclusions

1. State-owned estate inventories are an important source for researching the structure of peasant and *odnodvortsy* families in the 19th century. Even though this kind of source data has some shortcomings from a demographic point of view (attention was paid mainly to people who were able to work and could perform tasks), and there is a lack of data on the numbers of servants, the precise kinship between each individual and the head of the family recorded in the inventories allows for an easy classification of families according to Laslett's typology. In addition, the uniformity of the source means that the data can be effectively selected and systematized.

2. A large amount of data was selected for this research in order to provide the most representative reflection of peasant enserfed laborer and *bobyl'i* families, since representatives from these economic categories made up the majority.

However, the question arose as to how representative the data on all the categories of *odnodvortsy* and peasant semi-indentured laborers and peasant families actually is, because very few representatives from these groups lived in Samogitia. On the other hand, I assume that enough data was collected to conduct an analysis and to take note of the dominant tendencies in family structure.

3. After analyzing the empirical data and classifying it according to districts (Raseiniai, Šiauliai, Telšiai), social categories (peasants, *odnodvortsy*) and economic status (enserfed laborer, semi-indentured laborer, plot-holder, *bobyl'i* landless people), it became clear that there was no single dominant family type only among peasant enserfed laborers and semi-indentured laborers, whereas people from the other categories were more likely to live in nuclear families.

4. It is obvious that the variety in the composition of peasant enserfed laborer and semi-indentured laborer families was mostly determined by serfdom and the extent to which they could produce enough to survive from the land available to them. In contrast, the plot-holders with little land and landless *bobyl'i* could not survive on what they had, and so the search for additional means of survival (service on wealthier family farms, frequent movement from one residence to another) and their poverty meant that it was difficult for these individuals to realize their full biological potential; as such, their families were small and nuclear. It should be noted that this research deals with a very short period of time and only gives an interpretation of the data that can be gleaned from the inventories. As we know from historiography, it is likely that prior to and during the 18th century, the nuclear household dominated in Lithuania, and only later did more multiple-family households form. Thus, the dynamics of family composition in Samogitia in the first half of the 19th century can be best understood through research conducted in a broader chronological frame and based not only on inventories but also on parish records and tax censuses.

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Family Composition of Samogitian Peasants and *Odnodvortsy* Based on Mid-19th-Century Inventories

Summary

This article analyzes mid-19th century Imperial Russian state-owned estate inventory data on the composition of peasant and *Odnodvortsy* families, differentiating the families according to their economic status. Within this study, peasant and individual farmer families were classified according to Laslett's typology, since this particular typology is the most widely used in historiography, and also because the kinship between relatives was very precisely indicated in these inventories, making it easier to compare the collected data within the framework of Laslett's system. The research sample consists of 20,009 individuals who

lived in 3,225 families (including single-person households). The majority of the families were peasant enserfed laborers and landless peasant *bobyl'i* families. *Odnodvortsy*, peasant semi-indentured laborers and peasant plot-holder families were in the minority. It should also be noted that in the inventories most attention was paid to the able-bodied members of the population who could pay taxes and perform dues, whereas babies, young children and the elderly were less accurately enumerated, which made it difficult to reconstruct families precisely on the basis of the inventory material. After typologizing the families, it became clear that the nuclear family structure was most characteristic among *odnodvortsy*, along with peasant plot-holders and *bobyl'i* from all economic categories, even though *bobyl'i* and plot-holders often tended to live in non- family households. Meanwhile, there was no single dominant family type among peasant enserfed laborers and semi-indentured laborers, (there were similar numbers of nuclear, extended and multiple-family households). There were no fundamental differences between families living in the Raseiniai, Šiauliai and Telšiai districts. Since peasant enserfed laborers (along with semi-indentured laborers) made up the majority of the population enumerated in the inventories, it can generally be agreed that in the mid-19th century, Samogitia belonged to the transitional cultural zone in which neither the nuclear nor the multiple family dominated. However, this can be said only of the wealthier peasant serfs. Families of landless serfs and those with minimal land available to them were more likely to have a nuclear structure because in their search for additional means of subsistence, they would typically migrate from one wealthier peasant farm to another, which encouraged their families to disperse; in addition, landless serfs and those with little land were poor, which made it more difficult for them to achieve their full biological reproductive potential. *Odnodvortsy* families were more likely to be nuclear because they were formerly lesser nobles and could easily migrate, which is why their families tended to split off from the main family more often.

Rodziny chłopów i jednodworców na Żmudzi według inwentarzy z połowy XIX wieku

Streszczenie

W artykule przeanalizowano dane z inwentarzy dóbr państwowych w Imperium Rosyjskim w połowie XIX w. dotyczące składu rodzin chłopów i jednodworców, różnicując rodziny według ich statusu majątkowego. W trakcie badań rodziny chłopskie i jednodworców zostały sklasyfikowane zgodnie z typologią Lasletta, ponieważ jest ona najczęściej stosowana w historiografii, ponadto w inwentarzach bardzo precyzyjnie wskazywano relacje pokrewieństwa, dlatego ta typologia była najwygodniejsza w użyciu. Badanie objęło 20 009 mieszkańców, żyjących w 3 225 rodzinach (w tym w gospodarstwach jednoosobowych). Większość rodzin stanowiły rodziny chłopów ciągłych i komorników. Natomiast rodziny jednodworców i chłopów pieszych oraz chałupników stanowią mniejszość. Należy również zauważyć, że w inwentarzach koncentrowano się na mieszkańcach zdolnych

do płacenia podatków i wypełniania zobowiązań, podczas gdy niemowlęta, małe dzieci i osoby starsze nie były dokładnie rejestrowane, co utrudnia szczegółową rekonstrukcję rodzin na podstawie inwentarzy. Typologia rodzin wykazała, że w przypadku jednodworców i chałupników oraz komorników rodziny charakteryzował skład nuklearny, chociaż ogrodniki (zagrodnicy) i chałupnicy często żyli też w gospodarstwach nierodzinnych. Natomiast nie było jednego dominującego typu rodziny wśród chłopów ciągłych i pieszych (występowała podobna liczba rodzin nuklearnych, rozszerzonych i złożonych). Nie odnotowano znaczących różnic między rodzinami mieszkającymi w powiatach rosieńskim, szawelskim i telszewskim. Ponieważ chłopi ciągli (wraz z pieszymi) stanowili większość populacji wymienionej w inwentarzach, w zasadzie można przyjąć, że Żmudź w połowie XIX w. należała do przejściowej strefy kulturowej, w której ani rodzina nuklearna, ani złożona nie były dominujące. Dotyczy to jednak tylko zamożnych chłopów. Rodziny bezrolne i małorolne częściej były nuklearne, ponieważ ich członkowie wykazywali tendencje do ciągłej migracji między gospodarstwami bogatych chłopów w poszukiwaniu dodatkowych źródeł utrzymania, co skutkowało podziałem; ponadto chłopi bezrolni i małorolni byli biedni i dlatego trudniej im było wykorzystać swój potencjał biologiczny i reprodukcyjny. Rodziny jednodworców były w większości nuklearne, ponieważ była to drobna szlachta, która również mogła swobodnie migrować, dlatego w ich przypadku częściej dochodziło do podziałów.

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The Population Potential of the Largest Cities in the Second Polish Republic

Potencjał ludnościowy największych miast Drugiej Rzeczypospolitej Polskiej

Abstract

The article examines the most populous cities in Poland in the interwar period (with at least 100,000 inhabitants in 1939) in terms of size, structure and reproduction of their populations. The characteristics directly describe the cities' population potential or had a major influence on it. The data sources for the analysis were the archival publications of Statistics Poland.

Keywords

demography of the Second Polish Republic, population potential, most populous cities of the Second Polish Republic, population structure by socio-demographic characteristics, population reproduction

Abstrakt

W artykule przedstawiono charakterystykę najludniejszych miast Polski okresu międzywojnia (tj. liczących w 1939 r. co najmniej 100 tys. mieszkańców) z punktu widzenia stanu, struktur demograficznych oraz reprodukcji ludności. Charakterystyki te opisują w sposób bezpośredni potencjał ludnościowy tych miast lub stanowią istotne determinanty go kształtujące. Źródłem danych dla prowadzonych rozważań były archiwalne publikacje Głównego Urzędu Statystycznego.

Słowa kluczowe

demografia II Rzeczypospolitej Polskiej, potencjał ludnościowy, najludniejsze miasta II RP, struktury populacji według cech społeczno-demograficznych, reprodukcja ludności

Introduction

The territories that comprised the Second Polish Republic differed considerably in terms of their economic, social, cultural and civilisational development. These differences were mainly due to the partitioning of the First Polish Republic in the 18th century among Austria, Prussia and Russia, and the multi-ethnic structure of its population. While this diversity enriched the potential of the society of that time, it was also a source of difficulties and conflicts. In the territories annexed by Prussia, the socio-economic situation was relatively favorable. Although these areas were poorly industrialized, they were characterized by higher levels of urbanization, with a predominance of small and medium-sized cities. Socio-economic development was also more advanced, evidenced by an extensive railroad network and a low level of illiteracy among the population.

Conversely, the territories that were previously annexed by Russia faced significant challenges. While they were characterized by a relatively high degree of industrialization—serving as an industrial base for Russia—they were underdeveloped socio-economically. The rural areas in the Polesie Voivodeship were the least developed.

Galicia, which fell under Austrian control, was a center of Polish culture and academia. It was the only province in the Austrian partition that retained partial autonomy, including administrative. However, it was also marked by poverty and overpopulation, with a low level of urbanization.[1]

During the interwar period, Poland faced many challenges, the most pressing of which were the reconstruction of areas that had suffered during the First World War and the unification of the country's economic, social, legal, educational and other systems. The most important achievements and reforms of this period included the unification of the currency through the adoption of the Polish zloty, the construction of the port in Gdynia and the Central Industrial District, the containment of inflation, the partial modernization and industrialization of the country, the expansion of the railroad system, and the reduction of illiteracy.[2]

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[1] Andrzej Chwalba, *1919. Pierwszy rok wolności* (Wydawnictwo Czarne, 2019). Andrzej Chwalba, "Dziedzictwo zaborów," in *Polski wiek XX*, ed. Krzysztof Persak and Paweł Machcewicz (Wydawnictwo Bellona, Muzeum Historii Polski, 2009), 9–24; Dariusz Koreleski, "Stan urbanizacji i jej uwarunkowania w Polsce międzywojennej: wybrane zagadnienia," *Zeszyty Naukowe Małopolskiej Wyższej Szkoły Ekonomicznej w Tarnowie* 1, no. 11 (2013): 207–19; Wojciech Morawski, "Gospodarka II Rzeczypospolitej," in *Polski wiek XX*, ed. Krzysztof Persak and Paweł Machcewicz (Wydawnictwo Bellona, Muzeum Historii Polski, 2009): 273–300; Szymon Rudnicki, *Polska mozaika społeczna*, in *Polski wiek XX*, 303–27; Andrzej Gawryszewski, *Ludność Polski w XX wieku* (IGiPZ PAN, 2005), 107. Edward Rosset, *Demografia Polski*, vol. 1, *Stan, rozmieszczenie i struktura ludności* (PWN, 1975), 182–204.

[2] Chwalba, *1919*; Morawski, "Gospodarka."

Poland was characterized by a relatively low level of urbanization compared to other European countries at that time, especially those which were highly industrialized.[3] Nonetheless, the share of the urban population was increasing, although the pace of growth varied depending on the region. The varying growth rates were related to the economic development of the cities, with the largest population inflows noted in the rapidly industrializing urban centers. People moved to cities mainly in search of work, as the countryside was overpopulated during that period. Large cities were particularly attractive for settlers, although the quality of life varied considerably across cities.[4]

The term "population potential" referred to in the title is not clearly defined in the literature. In this study, the concept is interpreted quite broadly as encompassing both quantitative and qualitative aspects of the population, i.e., size, socio-demographic characteristics, reproduction, and migrations.[5]

The demographic and social problems faced by interwar Poland have been addressed in numerous publications dealing with the country as a whole or particular regions. When focusing on cities, academics have usually concentrated on individual centers or provided comparative analyses of a few selected cities.[6]

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[3] Urbanization is defined as an increase in the number and share of urban population in relation to the total population of a country or region. It is "an element of social change, including the emergence of modern society (modernization). (...) One of the main factors of urbanization is demographic transition." [translated by AM] See Marek Okólski and Agnieszka Fihel, *Demografia. Współczesne zjawiska i teorie* (Wydawnictwo Naukowe Scholar, 2012), 139–40; see also Kazimierz Dziewoński, *Rozwój i rozmieszczenie ludności Polski w XX wieku* (PWN, 1967), 132.

[4] In 1931, among the analyzed cities, the best living conditions, including sanitation, were found in Chorzów, Katowice and Poznań, where only 2.9%, 3.6% and 13.9% of residential buildings (accounting for 0.9%, 1.6% and 4.4% of the populations) respectively lacked running water, sewers, electricity, or gas. By contrast, in Lublin, Wilno, and Gdynia, 62.4%, 59.3% and 50.8% of residential buildings (33.3%, 36% and 35.1% of the population), respectively, had no utilities. See Andrzej Jezierski and Cecylia Leszczyńska, "Okres 1918–2000," in *Historia Polski w liczbach. Państwo i społeczeństwo*, vol. 1, ed. Franciszek Kubiczek (GUS, 2003), 461.

[5] A similar concept of population potential was used by Samuel Fogelson, "Struktura demograficzna ludności żydowskiej w Polsce," *Sprawy Narodowościowe* 6 (1938): 555–88; Anna Majdzińska, *Regionalizacja demograficzna. Wybrane metody i próby ich aplikacji* (Wydawnictwo Uniwersytetu Łódzkiego, 2016); Joanna Stańczak et al., "Potencjał ludnościowy Unii Europejskiej," in *Ekonomiczna pozycja Europy w świecie*, ed. Jerzy Kleer and Konrad Prandecki (Wydawnictwo Komitet Prognoz "Polska 2000 Plus" PAN, 2016), 29–56; Mirosława Gazińska, *Potencjał demograficzny w regionie. Analiza ilościowa* (Wydawnictwo Naukowe Uniwersytetu Szczecińskiego, 2003).

[6] See, for instance, Tadeusz Bartkowski, "Mapa gęstości zaludnienia wiejskiego Ziem Zachodnich w 1939 r.," *Przegląd Zachodni* 5–6 (1950): 472–77; Karol Bromek, "Rozwój demograficzny regionu Krakowa w okresie od 1869 do 1950," *Zeszyty Naukowe UJ. Prace Geograficzne* 9, (1964): 65; Henryk Chałupczak and Tomasz Browarek, *Mniejszości narodowe w Polsce w latach 1918–1995* (Wydawnictwo Uniwersytetu Marii Curie-Skłodowskiej, 1998); Samuel Fogelson, "Rola wędrówek w rozwoju demograficznym Polski," *Ekonomista* 1, (1937): 55–77; Wojciech Morawski, "Małżeństwa, urodzenia i zgony w woj. południowych w roku 1926 na tle województw zachodnich i niektórych krajów Europy," *Kwartalnik Statystyczny* 7, no. 1 (1930): 152–253; Alfons Krysiński, *Struktura narodowościowa miast polskich* (Biblioteka Spraw Narodowościowych: Instytut Badań Spraw

The purpose of this article is to examine the populations of urban centers in the Second Polish Republic that were classified as large cities (i.e., with a population of at least 100,000)[7] in the late interwar period. The analysis focuses on socio-demographic structures and reproduction characteristics, which were selected for their ability to describe and determine the populations' potential, directly or indirectly. Large cities in interwar Poland present an interesting subject for comparative research due to their relatively high demographic heterogeneity. This diversity was mainly due to the uneven pace of socio-economic development these cities experienced during the period of the Partitions.[8] To provide a comprehensive perspective, the analysis of these cities is set in the context of the broad socio-demographic landscape of the country[9] as well as groups of voivodeships[10] in interwar Poland.

Narodowościowych, 1937); Wiktor Ormicki, "Rozmieszczenie przyrostu rzeczywistego w Polsce (1921–1931)," *Wiadomości Geograficzne* 2 (1932): 28–31; Wiktor Ormicki, "Regionalizm demograficzny Polski," *Wiadomości Geograficzne* 3–5 (1932): 112–23; Jan Piekałkiewicz, "Drugi powszechny spis ludności w Polsce," *Przegląd Geograficzny* 11 (1931): 109–18; Arkadiusz Rzepkowski, *Ludność miasta Łodzi w latach 1918–1939* (Wydawnictwo Ibidem, 2008); Jerzy Smoleński, *Względne przewyżki i niedobory ludności polskiej na obszarze Rzeczypospolitej* (Księgarnia Geograficzna Orbis, 1926); Stefan Szulc, "Ruch naturalny ludności w Polsce w latach 1895–1935," in *Zagadnienia demograficzne Polski. Ruch naturalny ludności w latach 1895–1935: dokładność rejestracji urodzeń i zgonów, urodzenia wielorakie*, ed. Edward Szturm de Sztrem, and Stefan Szulc (GUS, 1936); Józef Wąsowicz, "Niektóre problemy rozmieszczenia ruchu naturalnego ludności w Polsce," *Czasopismo Geograficzne* 7, no. 4 (1929): 193–218; Bogdan Zaborski, *Antropogeograficzny atlas Polski*, 2B (Libraria Nova, 1937); Adam Wójcik, "Struktura ludności Lublina w okresie międzywojennym," *Przeszłość Demograficzna Polski – Poland's Demographic Past* 23 (2002): 121–42. Lists of studies dealing with the demographic aspects of interwar Poland can be found in Stanisław Liszewski, ed., *Geografia osadnictwa i ludności w niepodległej Polsce (lata 1918–1993)*, vol. 3, *Badacze* (PTG, 1994); Stanisław Liszewski, ed., *Geografia osadnictwa i ludności w niepodległej Polsce (lata 1918–1993)*, vol.1, *Ośrodki naukowo-badawcze i ich dorobek* (PTG, 1993).

[7] The definition of a large city (i.e., with a population of 100,000 or more) was drawn from *Mały Rocznik Statystyczny 1939*, GUS, Table 5, 44. The same definition was used by Rosset in *Demografia Polski*, vol. 1, *Stan*, 216–217. The names of cities analyzed in the paper are the same as used in interwar Poland.

[8] Among the cities analyzed in this study, Białystok, Częstochowa, Lublin, Łódź, Sosnowiec, Warszawa, and Wilno were in the Russian partition; Bydgoszcz and Poznań were in the Prussian partition; and Kraków and Lwów were in the Austrian partition. Chorzów (Królewska Huta until 1934) and Katowice became Polish cities in 1922, and Gdynia in 1920. In 1926, Gdynia received a city charter.

[9] The results for Poland are briefly compared with the situation in selected European countries in the interwar period to present general trends and significant differences in the formation of demographic processes in contemporary Europe (caused by countries' different levels of economic development and different stages of the demographic transition). The comparisons provide the study with a wider context for interpreting the results.

[10] The following groups of voivodeships are considered: the central group—the voivodeships of Warszawa (Warsaw), Łódź, Kielce, Lublin, and Białystok, plus the city of Warszawa (a voivodeship in its own right); the eastern group—the voivodeships of Wilno (now Lithuanian Vilnius), Nowogródek (now Belarusian Navahrudak), Polesie, and Wołyń; the western group—the voivodeships of Poznań, Pomerania, and Silesia; the southern group—the voivodeships of Kraków and Lwów, Stanisławów, and Tarnopol (now Ukrainian Lviv, Ivano-Frankivsk, and Ternopil, respectively). The Polish names

The main source of information for the study was publications from GUS (Główny Urząd Statystyczny (Central Statistical Office), now Statistics Poland). Most of the analyses are based on the results of the Second Census of 1931, but reference is also made to the results of the 1921 Census. The analyses of population reproduction mostly draw on studies containing verified and supplemented data on births and deaths,[11] although due to the lack of later data, the timeframe had to be limited to 1927–1932. The study also presents a selection of other population statistics for various years of the period under consideration.

Comments on the Reliability of Statistical Data

The demographic data of the interwar period raises concerns about its completeness and reliability. First of all, the size of the population and its structures at the beginning of the Second Polish Republic are uncertain due to the inaccuracy of data from the first general census conducted in 1921.[12] Regarding the second general census of 1931, the results on the ethnic structure of the population are called into question.[13] Secondly, information on migrations in the interwar period is incomplete because, in practice, internal migrations were not registered.

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of the voivodeships are: warszawskie, łódzkie, kieleckie, lubelskie, białostockie, Miasto Stołeczne Warszawa, wileńskie, nowogródzkie, poleskie, wołyńskie, poznańskie, pomorskie, śląskie, krakowskie, lwowskie, stanisławowskie and tarnopolskie. See *Mały Rocznik Statystyczny 1939*, X.

[11] "Małżeństwa, urodzenia i zgony 1927, 1928," in *Statystyka Polski*, Seria A, vol. 27 (GUS, 1934); "Małżeństwa, urodzenia i zgony 1929, 1930," in *Statystyka Polski*, Seria C, vol. 45 (GUS, 1937). "Małżeństwa, urodzenia i zgony 1931, 1932," in *Statystyka Polski*, Seria C, vol. 102 (GUS, 1939).

[12] Górny Śląsk (Upper Silesia) and Wilno were not included in the 1921 census (population figures for these areas were estimated based on earlier censuses). Also omitted were repatriated persons (mostly from Russia) and emigrants (the majority of whom were German nationals) after September 30, 1921 (mass migrations continued until about 1924). The census was also hindered by numerous technical and administrative problems. See, for example, Marek Barwiński, "Spisy Powszechne w Polsce w latach 1921–2011 – określanie czy kreowanie struktury narodowościowej?," *Acta Universitatis Lodziensis. Folia Geographica Socio-Oeconomica* 21 (2015): 53–72; Jan Berger, "Powszechny spis ludności w 1921 r." *Wiadomości Statystyczne* 12 (2008): 1–11; Gawryszewski, *Ludność Polski*, 66; Adam Jelonek, *Ludność miast i osiedli typu miejskiego na ziemiach Polski od 1810 do 1960* (Warszawa 1967): 24–25. Jan Piekałkiewicz, "Drugi powszechny spis," 109–118; Stefan Szulc, "O przyroście ludności w Polsce w okresie od r. 1921 do 1931," *Kwartalnik Statystyczny* 9, no. 1 (1932): 31–39; Stefan Szulc, "Dokładność szacunku ludności," *Kwartalnik Statystyczny* 9, no. 2 (1932): 160–161.

[13] Some of the concerns were related to:

– the suspicion that the number of Ukrainians was underestimated in favor of Poles (mainly in Eastern Galicia);

– frequent problems with interpreting respondents' answers about their first language and religion in terms of their nationality, because in the interwar period, many local communities in the eastern (particularly in Polesie) and north-eastern parts of the country were in the process of building their national awareness;

– a fairly large proportion of Polesie inhabitants identified their first language as "local."

Few cities at that time complied with the mandatory registration of residents introduced in 1928, so the available data is somewhat fragmentary. External migrations were registered, but their registers are also incomplete and inconsistent.[14]

The reliability of vital statistics is also low, especially between 1919 and 1926. This was mainly due to the deficient registration of vital events in the former Russian and Austrian annexed territories.[15] The registration of vital events in eastern Poland was particularly flawed, omitting a significant number of deaths, including the deaths of unbaptized and stillborn children. There were also major gaps in vital events registered by military chaplains.[16]

Statistics on deaths (especially of infants) are uncertain due to the dubious reliability of registers in eastern Poland in the Second Republic years. A frequent cause was high fees at the ministry and the drafting of a death certificate.[17]

Another significant problem during the interwar period was the late registration of births, which was most common in the eastern and central provinces.[18] The Jewish community, in particular, was characterized by the longest delays, or even sometimes non-registration of births, especially when the child had died. The births of boys were more often registered in due time than the births of girls.

See Włodzimierz Mędrzecki, "Liczebność i rozmieszczenie grup narodowościowych w II Rzeczypospolitej w świetle wyników II Spisu Powszechnego (1931 r.)," *Dzieje Najnowsze* 15, nos. 1–2 (1983): 231–52; Edward Szturm de Sztrem, "Prawdziwa statystyka," *Kwartalnik Historyczny* 3 (1973): 666; Janusz Żarnowski, *Społeczeństwo Drugiej Rzeczypospolitej 1918–1939* (PWN, 1973), 372–73.

[14] See Fogelson, "Rola," 68; Samuel Fogelson, "Wędrówki wewnętrzne," in *Encyklopedia Nauk Politycznych*, vol. 3 (Wydawnictwo Instytutu Społecznego i Instytutu Wydawniczego "Biblioteka Polska," 1938), 772; Gawryszewski, *Ludność Polski*, 376; Szulc, "Dokładność," 160–161; Szulc, "Ruch"; Andrzej Gawryszewski, "Przestrzenna ruchliwość ludności Polski, Bibliografia (lata 1896–1990)," *Dokumentacja Geograficzna* 7 (1997): 6, 8; Rozporządzenie Prezydenta Rzeczypospolitej z dnia 16 marca 1928 r. o ewidencji i kontroli ruchu ludności (Decree of the President of the Republic of March 16, 1928 on registration and control of population movement), Dz. U. (Journal of Laws) 1928, 32, item 309.

[15] Registering and reporting births, deaths, and marriages was not compulsory until 1927, when it was introduced by the Decree of the President of the Republic of Poland of February 1, 1927, on the Statistics of the Natural Movement of the Population (Rozporządzenia Prezydenta Rzeczypospolitej z dnia 1 lutego 1927 r. o statystyce ruchu naturalnego ludności) (Dz. U. (Journal of Laws), items 75 and 76). Before that, registers of these events differed regionally because of civil law inconsistencies—until 1927, Russian, Prussian, or Austrian legislation was used, depending on the partition. See Gawryszewski, *Ludność Polski*, 73; Wąsowicz, "Niektóre problemy," 193–94.

[16] Wąsowicz, "Niektóre problemy," 193–94.

[17] Szulc, "Ruch"; Gawryszewski, *Ludność Polski*, 190. Irena Gieysztorowa, *Wstęp do demografii staropolskiej* (PWN, 1976), 57–58.

[18] Children born at the end of the month were usually registered at the beginning of the following month. Additionally, more children were registered on the 10th, 15th and 20th day of each month (Stefan Szulc, "Fałszywe zgłaszanie dat urodzeń w Polsce," *Kwartalnik Statystyczny* 8, no. 1 (1931): 40–45. Szulc, "Ruch", 134. See also Gawryszewski, *Ludność Polski*, 73; Wąsowicz, "Niektóre problemy," 193–94.

In most cases, registrations were made when it was necessary to obtain a birth certificate, i.e., when the child began compulsory schooling.[19]

In addition, many Jewish marriages were ritualistic and unregistered, and children born to such unions were treated as illegitimate.[20] Irena Gieysztorowa observed that it was reasonable to assume that the populations inhabiting the central and eastern provinces of interwar Poland were actually bigger than the census data or estimates showed because the shortcomings in the records of vital events were usually accompanied by more serious irregularities in the records on the population size.[21] Only in the former Prussian partition were vital events fully registered.[22]

Changes in the Size of the Urban Population

At the end of the interwar period, the Second Polish Republic had 35 million inhabitants, so its population potential was considerable in comparison with other European countries.[23] Between 1921 and 1931, the country's population grew by 18% (see Table 1), mainly due to natural increase.[24]

In 1931, Poland had 636 cities and an urban population of 8.8 million (27.2% of its total population).[25] In comparison, in 1921 there were 611 cities, inhabited by 6.7 million people (24.6%).[26] By the end of the interwar period, Poland's urbanization rate had reached 30%. Between 1921 and 1938, the urban population increased by more than half, following a high positive migration balance, natural increase

[19] Szulc, "Ruch," 133, 141; Gieysztorowa, *Wstęp*, 57.

[20] Fogelson, "Struktura," 555–88.

[21] Gieysztorowa, *Wstęp*, 51.

[22] Szulc, "Ruch"; Gawryszewski, *Ludność Polski*, 28–31.

[23] In the second half of the 1930s, the European countries with the largest populations were the USSR (175 million, of whom 138 million lived in the European part of the country), Germany (68 million), Great Britain (47 million), Italy (43 million), France (42 million), Poland (35 million), and Spain (25 million). See *Mały Rocznik Statystyczny 1939*.

[24] Zofia Zarzycka and Jerzy T. Kowaleski, "Rozwój ludności Polski w latach 1919–1993," in *Rozwój demografii polskiej 1918–1993. Materiały z konferencji naukowej*, ed. Celina Groblewska, Warszawa, 22 listopada 1993 (GUS, 1994), 278.

[25] The Second Polish Republic varied considerably in terms of urbanization rates. In 1931, the urban population living in the western, central, southern, and eastern voivodeships accounted for 35%, 33%, 22%, and 14% of the total population in the country, respectively (Rosset, *Demografia Polski*, vol 1, *Stan*, 203).

[26] It should be noted that during the interwar period there was no clear definition of "a city." Consequently, city charters were granted based on heterogeneous criteria derived from various laws or other legal documents (see Franciszek Uhorczak, *Miasta w Polsce – ilość, wielkość, rozmieszczenie* [Księgarnia Książka" Aleksander Mazzucato, 1937], 227).

and administrative decisions incorporating areas around many urban centers into city boundaries.

The number of cities with populations of at least 100,000 increased from just six in 1921 to eleven in 1931 and fourteen in 1939. In 1931, people living in cities with at least 100,000 inhabitants accounted for 37.8% of the total urban population (76.7% of those lived in cities with a population of 200,000 or more). In 1939, these percentages were 38.3% and 75%, respectively (see Table 1).

Between 1931 and 1939, the population of all fourteen cities analyzed in the study increased by 14% (from 3.53 million to 4.02 million), with the fastest growth in population occurring in Gdynia (see Table 1). The city's development was primarily driven by the construction of the port, and a key factor that stimulated the growth in its population was a massive inflow of migrants, although the extension of administrative boundaries and a high natural increase also played a role. According to Gawryszewski, migrants accounted for 86% of Gdynia's residents in 1936.[27]

Table 1. The population in Poland and its largest cities in selected years between 1921 and 1939

Year	Poland[b]	Urban areas	Warszawa	Łódź	Lwów	Poznań	Kraków	Wilno	Bydgoszcz	Częstochowa	Katowice	Sosnowiec	Lublin	Gdynia	Chorzów	Białystok
	million		thousand													
1921[a]	27.2	6.7	937	452	219	169	184	129	88	80	50	86	94	1	73	77
1926	29.3	.	1,015	554	237	220	200	170	.	88	113	100	108	.	.	80
1931[a]	32.3	8.8	1,172	605	312	245	219	195	117	117	126	109	112	30	81	91
1935	33.4	.	1,220	608	317	257	233	207	124	128	130	116	114	84[c] 102[d] 105[e]	.	.
1939	35.3	10.5	1,289	672	318	272	259	209	141	138	134	130	122	120	110	107

Note: Cities ranked by population in 1939.

[a)] Census data. [b)] In 1921 and 1931, including the army in barracks. [c)] Data from the Gdynia population census of May 19, 1936. [d)] Population register data as of December 31, 1936. [e)] Data from the Gdynia population census of May 1, 1937.

Source: Author's own work based on GUS data – *Rocznik Statystyki Miast Polski 1930*; *Rocznik Statystyki Rzeczypospolitej Polskiej 1930*; *Mały Rocznik Statystyczny* (for 1930, 1935–1939); *Rocznik Statystyczny Gdyni 1937–1938*; Andrzej Jezierski and Cecylia Leszczyńska, "Okres 1918–2000," in *Historia Polski w liczbach. Państwo i społeczeństwo*, ed. Franciszek Kubiczek, vol. 1 (GUS, 2003), 357.

[27] Gawryszewski, *Ludność Polski*, 385.

During the interwar period, Warszawa (Warsaw) was among the most populous European cities, ranking seventh in 1931 and eighth in 1938. Its population accounted for about 3.5% of the urban population in Europe and 0.24% of Europe's total population.[28] Łódź, the second-largest city in interwar Poland and one of Europe's light industry hubs,[29] ranked 32nd in the early 1930s.[30]

The demographic picture of cities in interwar Poland was largely formed by migration. It is estimated that between 1921 and 1931, cities took in 1.3 million people, mostly from rural areas, whose inflow was largely influenced by the economic situation in the country. "New jobs created in periods of economic upswing (1926–1928, 1935–1938) attracted the residents of nearby villages; economic downturns increased unemployment, forcing the terminated migrants back to the overpopulated countryside" (the economic crisis of 1929–1935 slowed the development of cities in the 1930s).[31]

Net migration rates (per 1,000 inhabitants) calculated for the large cities on which data was available were 10.6 for Poznań (a 1931–1937 average),[32] 22.5 for Bydgoszcz (1933–1937),[33] 2.9 for Łódź (1928–1936),[34] 8.2 for Katowice (1927–1938),[35] and 78.1 (permanent migrations) and 49.6 (temporary migrations) for Gdynia (1934–1937).[36]

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[28] The most populous cities in Europe (i.e., with at least 1 million inhabitants) in the second half of the 1930s were London (8.66 million, including suburbs), Paris (4.96 million, including suburbs), Berlin (4.30 million), Moscow (3.64 million), Leningrad (2.74 million), Vienna (2.09 million), Hamburg (1.68 million), Warsaw (1.29 million), Rome (1.28 million), Milan (1.20 million), Barcelona (1.15 million), Glasgow (1.13 million), Budapest (1.06 million), Madrid (1.05 million), and Birmingham (1.03 million). See *Mały Rocznik Statystyczny 1939.*

[29] Chwalba, *Dziedzictwo zaborów*; Jerzy Kwiatek and Teofil Lijewski, *Leksykon miast polskich* (Wydawnictwo Muza, 1998).

[30] Other cities with populations similar to that in Łódź were Genoa (608,000), Turin (597,000) and Lisbon (594,000) (see Cecylia Leszczyńska, "Terytorium i ludność" (Tab. 4. 50 największych miast w Europie. 1930–1931), in *Historia Polski w liczbach. Polska w Europie,* ed. Franciszek Kubiczek (GUS, 2014), 64–66).

[31] See Gawryszewski, *Ludność Polski*, 117, 376, 380 and 384–85.

[32] Author's own calculations based on *Rocznik Statystyczny Stołecznego Miasta Poznania za lata 1937–1938.*

[33] Author's own calculations based on *Rocznik Statystyczny Miasta Bydgoszczy* (for 1933, 1934, 1935, 1936, 1937).

[34] Between 1929 and 1931, the permanent migration rate was negative. Author's own calculations based on data from *Rocznik statystyczny Miasta Łodzi* (for 1928, 1929 and 1936) and *Miasto Łódź. Mały Rocznik Statystyczny 1930/1934*.

[35] This number describes permanent migration and includes residents changing residence within the city limits. The actual influx of people in that period was probably much higher. For example, in 1938, the difference between people who respectively applied for registration and de-registration from permanent residency reached 684, contrasting with 2,800 people seeking temporary residency. Calculations based on data from *Rocznik Statystyczny Miasta Katowic* (1937 and 1938).

[36] Author's own calculations based on *Rocznik statystyczny Gdyni 1935–1936.* The population size of December 1936 was adopted (see Table 1).

Changes in the Age-Sex Structures of Urban Populations

In the 1920s and 1930s, Poland's demographic structures were still recovering from the impact of World War I. These effects were both the direct consequences of hostilities and the indirect results of forced displacements and voluntary migrations.[37] Evidence of this recovery can be seen in the feminization ratios of the time (see Table 2). They show a relatively higher proportion of women in the 20–29 and 30–39 age groups in 1921, and in the 30–39 and 40–49 age groups a decade later.[38] The predominance of women was significantly greater compared with the immediately older age groups.

By 1931, Poland's overall feminization ratio stood at 106 women for every 100 men. This imbalance was even more pronounced in urban areas than in rural areas (see Table 2). The sex structure of large cities mirrored that of the urban population as a whole. In both populations, the feminization rates in almost all age groups (excluding children) were higher than those recorded for the country and rural areas. The feminization rates for comparable age groups varied considerably between the cities analyzed.

In 1931, the sex structure of the population was imbalanced in almost all cities except for Chorzów.[39] This imbalance manifested as a clear predominance of women in the total population. For instance, in Kraków, Wilno, Lwów and Warszawa, there were as many as 119–122 women per 100 men. Gdynia was unique with only 87 women per 100 men. Interestingly, men outnumbered women in almost all age groups, excluding the elderly population (see Table 2).

Poznań and Warszawa are notable regarding the oldest age group, which had the greatest overrepresentation of women to men (the number of women was about twice that of men).

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[37] Rosset, *Demografia Polski*, vol. 1, *Stan*, 251. Detailed information on emigration from interwar Poland can be found in publications by Fogelson, "Rola"; Edward Kołodziej, "Emigracja z ziem polskich i Polonia 1871–1939. Liczebność i rozmieszczenie," *Przeszłość Demograficzna Polski – Poland's Demographic Past* 18 (1991): 13–51.

[38] Because the census of 1921 left out a significant portion of the repatriated population, the actual feminization ratios may be different from those in Table 2.

[39] This observation is based on the Rosset scale, which divides the feminization ratios into five categories: I (less than 100 women per 100 men)—"men outnumber women"; II (100–103.9)—"balance between both sexes or women slightly outnumber men (a favorable situation)"; III (104–107.9)—"disturbed balance between both sexes"; IV (108–111.9)—"significantly disturbed balance between both sexes"; V (112 and more women per 100 men)—"highly abnormal sex structure" (Rosset, *Demografia Polski*, vol. 1, *Stan*, 247).

Table 2. Feminization rates in Poland in 1921 and 1931 and the most populated cities in 1931 (women per 100 men)

Specification	Total	0–9	10–19	20–29	30–39	40–49	50–59	60–69	70+
				1921					
Poland[a]	106.9	98.4	104.2	114.9	117.0	109.2	106.2	105.7	108.5
				1931					
Poland[a]	105.6	97.5	101.9	102.9	112.8	114.7	114.2	116.2	123.1
Urban areas	112.7	97.2	105.5	119.1	119.8	116.8	116.7	129.8	152.2
Large cities[b]	112.8	97.0	103.9	123.0	121.7	114.3	111.4	131.8	170.5
Rural areas	104.7	97.6	100.7	105.9	109.8	113.7	113.1	111.3	114.1
Białystok	114.8	94.4	110.1	134.1	121.2	115.9	114.0	114.8	129.0
Bydgoszcz	110.4	96.9	95.3	123.3	119.0	110.0	112.3	127.4	160.8
Chorzów	104.2	95.5	99.2	107.7	101.3	110.1	104.1	120.7	173.2
Częstochowa	117.2	97.6	108.4	128.0	130.6	123.8	113.5	141.2	173.4
Gdynia[c]	87.0	95.5	98.2	93.0	73.2	72.7	83.3	100.0	133.3
Katowice	106.0	97.5	101.9	116.4	102.7	101.5	102.1	126.1	175.0
Kraków	122.2	98.7	110.7	125.1	136.7	121.7	127.5	150.0	177.3
Lublin	115.3	98.2	106.2	125.3	122.7	113.5	119.8	141.6	173.5
Lwów	119.4	96.5	112.8	121.5	130.7	124.6	121.3	133.8	165.5
Łódź	117.2	98.6	109.5	124.7	127.0	121.2	118.3	130.9	171.1
Poznań	115.1	96.5	102.6	114.9	133.7	116.4	117.6	146.3	205.6
Sosnowiec	108.2	95.5	105.5	115.6	115.7	110.0	100.0	115.2	180.2
Warszawa	119.4	97.4	112.2	123.7	126.5	123.7	119.9	145.5	190.7
Wilno	121.0	97.8	106.8	126.9	132.3	130.7	130.7	145.5	168.4

[a)] Including the army in barracks. [b)] Cities with a population of at least 100,000 in 1931 (cf. Table 1). [c)] Data for 1936.

Source: Author's own calculations based on GUS data – *Pierwszy Powszechny Spis Rzeczypospolitej Polskiej z dnia 30 września 1921 roku*; *Rocznik Statystyki Miast Polski 1930*; *Wyniki ostateczne opracowania Spisu Ludności z dn. 9.XII 1931 r. w postaci skróconej dla wszystkich województw, powiatów i miast powyżej 20000 mieszkańców Rzeczypospolitej Polskiej*; *Mały Rocznik Statystyczny 1939*.

Poland's interwar population was relatively young. It had a high proportion of children and adolescents and a low proportion of elderly people (see Table 3), and our analysis shows that the age groups 0–9, 20–39 and 60+ increased between 1921 and 1931. The rising percentage of children in those years was largely related to a higher number of births (compensating for the low numbers[40] in the war years)

[40] Edward Rosset, *Prawa demograficzne wojny* (A paper delivered at the International Congress of Population Research, Rome, September 8, 1931), Łódź, 1933, 18.

and the population age structure. In 1931, the proportion of people aged 20–29 (i.e., those who are mostly likely to reproduce) was relatively large, accounting for 19% of the country's overall population and 21% of the urban population. The age structures of the population living in large cities and the overall urban population were relatively similar. However, they differed significantly from the age structure of the country's population, mainly due to the lower proportion of children and young people and a higher proportion of working-age people (see Table 3).

In most of the cities in question, the percentages of children aged 0–9 and adolescents aged 10–19 were lower than respective national urban averages. In 1931, the highest percentages of children aged 0–9 were in Częstochowa, Sosnowiec, Gdynia, Bydgoszcz, and Lublin (20–21%). By contrast, Lwów[41] and Kraków had the lowest (14% each). The cities with the largest shares of residents aged 20–59 years (approximately representing the working-age population) were Gdynia, Lwów, Warszawa, and Kraków (60–63%). The largest percentages of elderly people were found in Białystok, Kraków, Wilno and Lwów, and the lowest in Gdynia. The cities exhibited considerable diversity in the distribution of various age groups within their total population.[42]

Gdynia is noteworthy because half of its residents were aged 20–39, representing the younger segment of the labor force; men accounted for 55% of this age group. By contrast, only 13% of residents fell into the 40–59 age group (the next age group). The demographic structure was shaped by a massive influx of new arrivals, mainly male job seekers.

The cities in question were also different regarding the ratios between the oldest and youngest subpopulations (see Table 3). The largest differences occurred in Kraków (58 people aged 60+ per 100 children aged 0–9) and Gdynia (12 people aged 60+ per 100 children).

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[41] Based on the scale of population aging proposed by Edward Rosset in 1959, it can be assumed that in the interwar period, the cities' populations had crossed the threshold of "pre-aging." The scale classifies population aging using the percentage of people aged 60 and over into four categories: "under 8%—demographic youth; 8–10%—pre-aging; 10–12%—proper aging; 12% and more—demographic old age." According to the Beaujeu-Garnier scale of 1956, with the subpopulation aged 0–19 accounting for less than 35% and the subpopulation aged 60+ constituting less than 12%, Poland and all of the analyzed cities were at the stage of "demographic youth" (Edward Rosset, *Ludzie starzy. Studium demograficzne* [PWE, 1959], 173–74.)

[42] The differentiation was determined using the coefficient of variation (the quotient of the standard deviation and the arithmetic mean calculated from age groups' shares of the cities' populations). In 1931, the largest differentiation of the cities was related to the 60+ age group, and then age groups 50–59, 30–39, and 0–9. The respective coefficients of variation were 0.21; 0.15; 0.12 and 0.1.

Table 3. The population age structure in Poland in 1921 and 1931, and in the most populated cities in 1931

	Population by age group (%)								Population 60+ per 100 children aged 0–9	Population 60+ per 100 people aged 0–19
	0–9	10–19	20–29	30–39	40–49	50–59	60+	Age unknown		
					1921					
Poland[a]	21.6	26.0	16.8	11.4	9.3	7.7	7.2	.	33.3	15.1
Urban areas	18.9	24.9	30.8		18.3		6.7	0.4	35.7	15.4
					1931					
Poland[a]	24.8	18.1	19.3	13.3	9.4	7.1	7.8	.	31.5	18.2
Urban areas	20.3	17.3	20.8	15.2	10.8	7.8	7.8	.	38.4	20.7
Large cities[b]	20.6	17.8	20.8	15.6	11.0	7.5	6.7	.	17.5	20.6
Białystok	18.9	16.1	20.5	16.3	11.0	8.6	8.6	.	45.1	24.4
Bydgoszcz	20.3	16.7	20.7	17.2	11.0	7.2	6.8	0.1	33.4	18.4
Chorzów	19.6	17.6	20.9	16.1	10.2	8.6	7.0	.	35.6	18.8
Częstochowa	21.1	18.8	20.6	14.1	11.0	7.5	6.8	0.1	32.3	17.1
Gdynia[c]	20.6	13.5	26.6	23.3	9.1	4.0	2.5	0.4	12.2	7.4
Katowice	18.6	17.3	22.0	17.8	10.7	7.7	5.9	.	31.5	16.3
Kraków	14.3	17.1	24.5	15.9	11.6	8.3	8.3	.	57.6	26.3
Lublin	20.2	17.9	20.0	15.4	11.2	7.7	7.5	0.1	37.1	19.6
Lwów	14.5	15.5	24.8	16.1	12.0	9.0	8.0	0.2	55.3	26.7
Łódź	19.0	15.7	21.7	16.0	11.9	8.3	7.3	0.1	38.6	21.1
Poznań	18.0	15.9	23.4	17.4	11.2	7.5	6.3	.	35.1	18.6
Sosnowiec	21.0	17.7	21.7	15.6	10.8	7.4	5.7	0.1	27.2	14.7
Warszawa	16.8	15.4	22.9	16.6	12.1	8.1	7.7	0.3	45.9	23.9
Wilno	18.3	15.7	21.2	15.8	11.9	8.9	8.1	.	44.4	23.9

[a] Including the army in the barracks.
[b] Cities with a population of at least 100,000 in 1931 (see Table 1).
[c] Data for 1936.

Source: Author's own calculations based on GUS data – *Pierwszy Powszechny Spis Rzeczypospolitej Polskiej z dnia 30 września 1921 roku*; *Wyniki ostateczne opracowania Spisu Ludności z dn. 9.XII 1931 r. w postaci skróconej dla wszystkich województw, powiatów i miast powyżej 20000 mieszkańców Rzeczypospolitej Polskiej*; *Mały Rocznik Statystyczny 1939.*

Significant differences in the age structure between the populations of most large cities and the urban population in the country[43] indicate that demographic processes unfolded differently in these cities. In 1931, Lublin's age structure was most similar to that of the national urban population (98.6%). In contrast, Gdynia and Lwów exhibited the greatest divergence (85.5% and 92.4%, respectively). Łódź and Wilno (98.6%) were the most similar in terms of age structure, followed by Kraków and Lwów (98.1%) and Białystok and Wilno (98%). Gdynia was notably different from the other cities in that respect (see Table A1).

Transformations in the Social Structures of Urban Populations

One of the important drivers of the social, demographic and economic development of a country is an increasingly better-educated population. Interwar Poland was beset by a relatively high illiteracy rate (one of Europe's highest),[44] although compulsory education for children aged 7–14 introduced in 1919 improved literacy between 1921 and 1931.[45] The illiteracy problem was less severe in urban than rural areas and was more common among women than among men (see Figure 1).

The highest percentage of illiterate people in the population aged 10 years and over occurred in the eastern voivodeships, and the lowest (practically negligible) were found in western Poland. The illiteracy rates in the cities were markedly lower than in the regions to which they administratively belonged. In 1931, the highest literacy rates were noted in Poznań, Katowice, Chorzów, Bydgoszcz and Gdynia, where only 1–2% of the population aged ten and over were illiterate. In contrast, Lublin and Łódź had the highest illiteracy rates for this age group, higher than the national average for urban areas.

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[43] The similarity of population age structures between the cities was assessed using a coefficient (see Czesław Domański, ed., *Metody statystyczne. Teoria i zadania* [Wydawnictwo Uniwersytetu Łódzkiego, 2001], 36) calculated as:

$$W_p = \sum_{j=1}^{k} \min(x_{1j}, x_{2j})$$

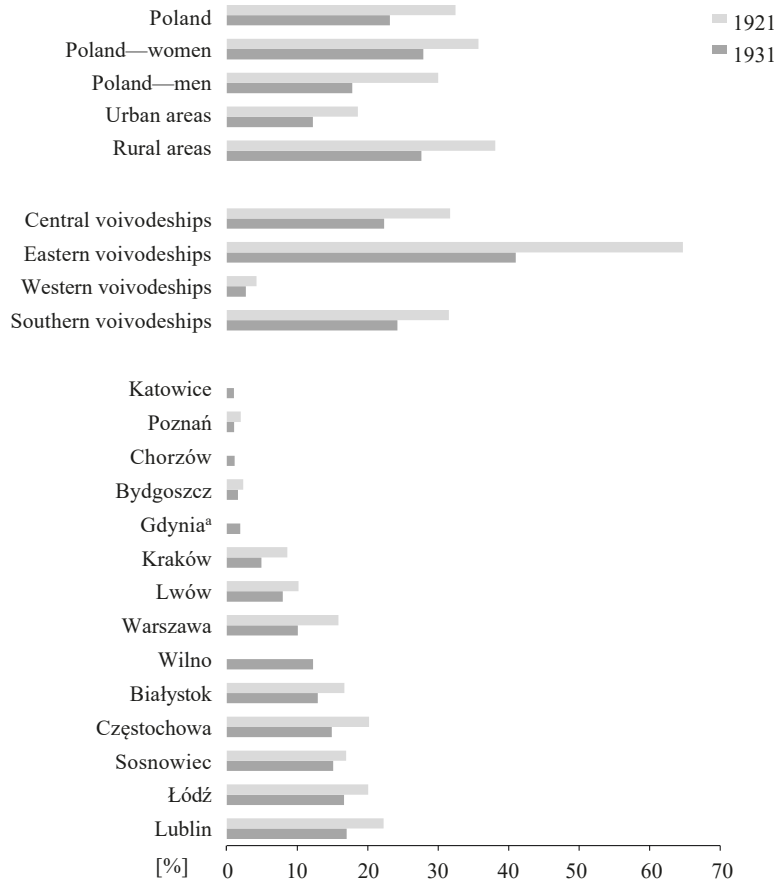
where x_{1j}, x_{2j} are indicators of the structure of population 1 and population 2 calculated for the j-th category.

The coefficient takes values in the range <0;1>, with higher values pointing to a greater similarity between the compared structures and vice versa.

[44] In Poland, the illiteracy rate for the population aged 10 years and over was similar to that in Italy (21.6% in 1931) and Spain (23.2%, 1940). Higher illiteracy rates were noted in that period in Bulgaria (31.4%, 1934), Greece (40.8%, 1928), Yugoslavia (45.2%, 1931), and Portugal (48.7%, 1940). The countries with the lowest illiteracy rates were Sweden (0.1%, 1930), France (3.8%, 1936), Czechoslovakia (4.1%, 1930), and Hungary (6%, 1941). UN data (*Demographic Yearbook 1948*).

[45] By virtue of the *Dekret o obowiązku szkolnym* (Decree on Compulsory Education) (Dz. Pr.P.P. [Journal of Laws of the Republic of Poland] 1919 no. 14, item 147).

Figure 1. Illiteracy rates for Poland, groups of voivodeships, and the most populated cities in 1921 and 1931 (% of the population aged 10+)



[a] The data for Gdynia is from 1936.

Source: Author's own calculations based on GUS data – *Pierwszy Powszechny Spis Rzeczypospolitej Polskiej z dnia 30 września 1921 roku*; *Wyniki ostateczne opracowania Spisu Ludności z dn. 9.XII 1931 r. w postaci skróconej dla wszystkich województw, powiatów i miast powyżej 20000 mieszkańców Rzeczypospolitej Polskiej*; *Mały Rocznik Statystyczny 1939.*

The population of interwar Poland represented a mosaic of nationalities, ethnicities, religions, and cultures. While they enriched the country's population potential, they were also a cause of difficulties and, in many cases, social conflicts.[46] National and ethnic affiliation was a factor that exerted a strong influence on population reproduction.

[46] See, e.g., Chwalba, *1919*; Rudnicki, *Polska*; Żarnowski, *Społeczeństwo*, 372–401.

In 1931, people whose first language was Polish accounted for 69% of the country's population, while Roman Catholics represented the major religious group (65%). The residents of Poznań and Gdynia were the most homogeneous in terms of nationality and religion (Poles accounted for 97% and 98%, respectively). In contrast, Białystok and Łódź had more diverse ethnic compositions. In these cities, the Polish population accounted for 51 and 59%, respectively. Coexisting with other ethnic groups, among which Jews were notably numerous (see Table A2).

Reproduction of the Population

In the interwar period, Poland had a positive and fairly high rate of natural population increase because the rate of births was high enough to more than compensate for the relatively high death rate. The highest birth rates that were noted in the first years after World War I were a reaction to the few births during the war. The death rates (including infant mortality rates) were also the highest at that time, which was partly related to the war (high mortality rates among veterans) and partly to the poor living conditions, disease, poverty and the lack of medical care. Health improved in the 1930s as a result of improving sanitation and living conditions, as well as the smallpox vaccination of children, which was made compulsory in 1919.[47]

Between 1927 and 1932, Poland's rate of natural population increase ranged from 14 to 16 per 1,000. The vital index of the population, calculated as the ratio of live births to deaths, was 190–200 to 100 (see Table 4). The positive, high rate of natural population increase associated with increased fertility translated into a higher rate of reproduction. The spatial distribution of birth rates was very irregular. In the early 1930s, the highest rates were noted in the Polesie voivodeship, while the lowest rates were observed in large cities and areas bordering the Poznań voivodeship.[48] Also noticeable were differences in reproduction between the populations of the large cities.

In most of the cities considered in the study, birth rates, natural population increase rates and demographic dynamics were below the respective averages for Poland's urban population. However, their death rates were relatively similar to the national urban average[49] (see Table 4). This indicates that reproductive processes

[47] Gawryszewski, *Ludność Polski*, 175.

[48] Szulc, "Ruch," 48–50.

[49] Rosset assessed the interwar mortality rate in Poland as high. As he observed, many mortality scales existed at that time, but their applicability diminished with declining death rates. Additionally, their practicality was dubious because the crude death rates they used disregarded the age population structure. The mortality scales used in that period included the Sarkar Scale (1931) and the Batkis Scale (1940). The Sarkar Scale classified crude death rates (per 1,000 population) of up to 15‰, 15–20‰ and above 20‰ as low, medium, and high, respectively. On the Batkis Scale (1940), crude

in large cities different significantly from those in other parts of the country. Gdynia had the highest rate of natural population increase, with the number of live births almost triple that of deaths. In contrast, Kraków, Lwów, and Warszawa recorded the lowest (see Table 4).

In the interwar period, Poland's total fertility rate (TFR) was one of the highest in Europe,[50] reaching 3.5 children per woman of childbearing age between 1931 and 1932. This rate varied significantly between urban and rural areas, with urban areas averaging 2.2 children and rural areas 4.1 children. However, the TFRs showed strong regional variations (see Figure 2).[51] In most large cities, the TFRs were significantly lower than the national average for the urban population and the average rate in their regions, falling below the level replacement. For instance, Warszawa and Kraków had fertility rates of just 1.2 children per woman.[52] Szulc commented that cities "contrasted with adjacent areas" in that respect.[53]

In the early 1930s, large cities had markedly different fertility patterns, which also differentiated them from Poland in general (see Figure 3). The highest fertility rates were noted across the country for women aged 25–29 years. The Warszawa fertility rate for this age group (74 births per 1,000 women) was significantly lower than in Bydgoszcz,[54] Łódź or Poznań (101, 98 and 96 births, respectively).

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death rates of 10–12‰, 13–17‰, 18–25‰ and above 25‰ were marked as low, medium, high and very high, respectively. Edward Rosset, *Demografia Polski*, vol. 2, *Reprodukcja ludności* (PWN, 1975), 281–84.

[50] For instance, in the late 1930s, fertility rates in Belgium, Switzerland, Sweden, and the United Kingdom ranged from 1.6 to 1.9 (thus, they were below the population replacement level of 2.1 children per woman of childbearing age). Denmark, Germany and France had fertility rates between 2.0 and 2.3, with Italy, Iceland, Spain and Portugal between 2.8 and 3.1 (author's own calculations based on UN data from the *Demographic Yearbook 1948*).

[51] The actual theoretical fertility rates and partial fertility rates may have been slightly different from those given in Figures 2 and 3 because of likely gaps in reporting. Additionally, the data used to calculate the rates comes from different sources and was aggregated at different levels. The same applies to the standardized death rate (see Figure 4).

[52] The marital fertility rate ensured reproduction above 2.1 children in both large cities and other areas. Between 1931 and 1932, the rate was estimated at 5.3 children in large cities and 6.4 children in other urban areas (the respective rates for Poland and rural areas were 6.9 and 7.3, respectively). Author's own calculations based on *Mały Rocznik Statystyczny 1939.*

[53] Szulc, "Ruch," 49. See also Gawryszewski, *Ludność Polski*, 157.

[54] Fertility rates in Bydgoszcz in 1932–1933 were 24, 120, 101, 68 and 10 births per 1,000 women aged 15–20, 21–25, 26–30, 31–40, and 41–50 years. Because the rates do not fully correspond to those in other cities as a result of the last two groups being wider, they are not shown in Figure 3 (author's own calculations based on *the Rocznik Statystyczny Miasta Bydgoszczy* (published in 1932 and 1933) and the *Drugi Powszechny Spis Ludności z dn. 9.XII.1931 r. (wyniki dla woj. poznańskiego).*

Table 4. Vital statistics for Poland and its most populated cities in 1927–1928, 1929–1930 and 1931–1932

Specification	Poland	Urban areas	Large cities	Białystok	Bydgoszcz	Chorzów	Częstochowa	Gdynia	Katowice	Kraków	Lublin	Lwów	Łódź	Poznań	Sosnowiec	Warszawa	Wilno
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1927–1928																	
Crude birth rates (per 1,000 population)	30.1	21.3	18.2	.	23.3	22.3	.	.	21.1	18.1	25.4	13.7	19.4	21.3	21.4	17.7	21.0
Crude death rates (per 1,000 population)	15.9	13.3	12.9	.	13.2	14.1	.	.	12.2	14.5	17.4	11.4	13.1	12.5	13.2	13.6	13.7
Natural increase (per 1,000 population)	14.2	8.0	5.4	.	10.2	8.2	.	.	9.0	3.5	8.0	2.4	6.4	8.8	8.2	4.1	7.3
Vital index	189.3	160.1	141.8	.	177.1	158.2	.	.	173.8	124.3	145.8	121.0	148.6	170.4	162.4	130.3	153.0
Infant mortality rates (per 100 births)	14.8	13.4	14.2	.	18.3	19.0	.	.	16.8	10.9	12.4	9.4	16.6	15.1	16.7	13.8	12.4
1929–1930																	
Crude birth rates (per 1,000 population)	31.2	22.3	19.5	17.9	23.8	23.2	27.0	.	22.4	15.8	24.3	13.0	20.9	20.8	24.1	18.4	20.5
Crude death rates (per 1,000 population)	15.6	12.6	12.5	10.9	12.6	13.1	13.8	.	11.8	12.0	14.1	9.8	12.7	11.8	12.6	12.9	13.9

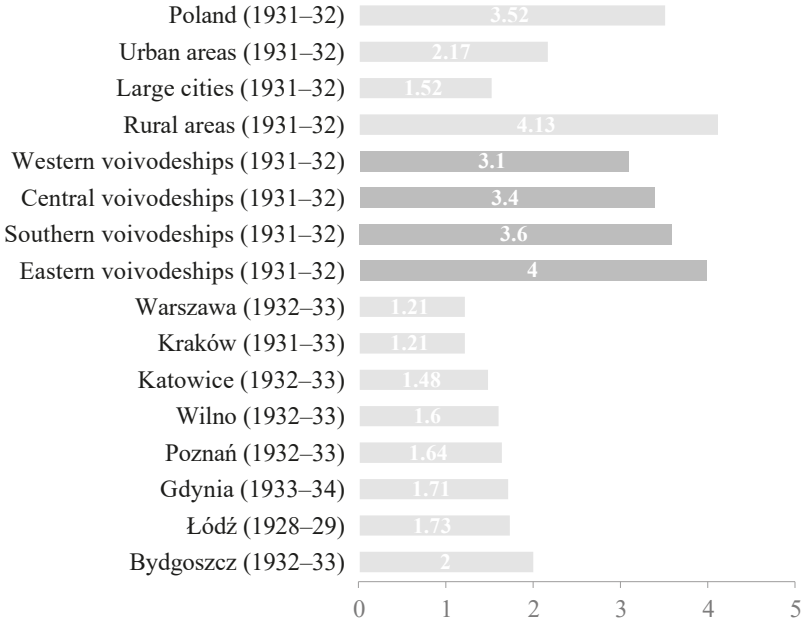
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Natural increase (per 1,000 population)	15.6	9.7	7.0	7.0	11.2	10.0	13.2	.	10.7	3.9	10.3	3.3	8.2	9.0	11.5	5.5	6.6
Vital index	200.2	177.1	156.2	163.9	189.5	176.6	195.5	.	190.5	132.1	172.9	133.8	164.4	175.9	190.7	142.9	147.1
Infant mortality rates (per 100 births)	14.6	12.5	13.1	9.2	16.2	15.7	14.6	.	15.4	11.5	11.1	8.9	14.2	13.1	14.6	12.4	13.8
1931–1932																	
Crude birth rates (per 1,000 population)	29.4	21.1	17.4	17.8	21.3	21.1	23.3	35.6	19.3	14.9	21.1	15.7	17.6	19.9	19.6	15.7	19.2
Crude death rates (per 1,000 population)	15.2	12.6	12.3	10.8	12.4	11.5	13.8	12.3	10.7	11.4	13.2	11.3	12.6	11.7	12.3	12.5	13.3
Natural increase (per 1,000 population)	14.2	8.5	5.1	7.0	8.8	9.6	9.5	23.4	8.6	3.4	8.0	4.4	5.1	8.1	7.3	3.2	5.8
Vital index	193.7	167.3	141.4	165.3	171.0	183.2	168.5	290.6	180.8	130.0	160.3	139.2	140.4	169.4	159.4	125.2	143.9
Infant mortality rates (per 100 births)	14.3	12.1	12.9	9.1	13.8	12.3	16.4	14.8	13.9	9.9	10.3	8.0	14.2	11.0	15.2	13.5	13.9

Comment: between 1927 and 1928, the group of large cities (with a population of 100,000 or more) consisted of Warszawa, Łódź, Sosnowiec, Lublin, Wilno, Poznań, Bydgoszcz, Katowice, Kraków, and Lwów. From 1929 to 1932, it also included Częstochowa.

Source: Author's own calculations based on *Małżeństwa, urodzenia i zgony 1927, 1928*, Statystyka Polski, Seria A, vol. 27 (GUS, 1934); *Małżeństwa, urodzenia i zgony 1929, 1930*, Statystyka Polski, Seria C, vol. 45 (GUS, 1937); *Małżeństwa, urodzenia i zgony 1931, 1932*, Statystyka Polski, Seria C, vol. 102 (GUS 1939); *Mały Rocznik Statystyczny 1939.*

An interesting finding was that large cities had significantly different teenage fertility rates. Of those cities for which data was available, Warszawa had the lowest rate (10 births per 1,000 women aged 15–19), while Poznań, Bydgoszcz and Wilno had the highest rates (28, 24 and 23 births, respectively). These rates in Poznań, Bydgoszcz, and Wilno were similar to those found in rural areas and the southern and eastern parts of Poland.

Figure 2. Total fertility rates (TFR) for Poland and groups of voivodeships and cities in selected years between 1928 and 1934

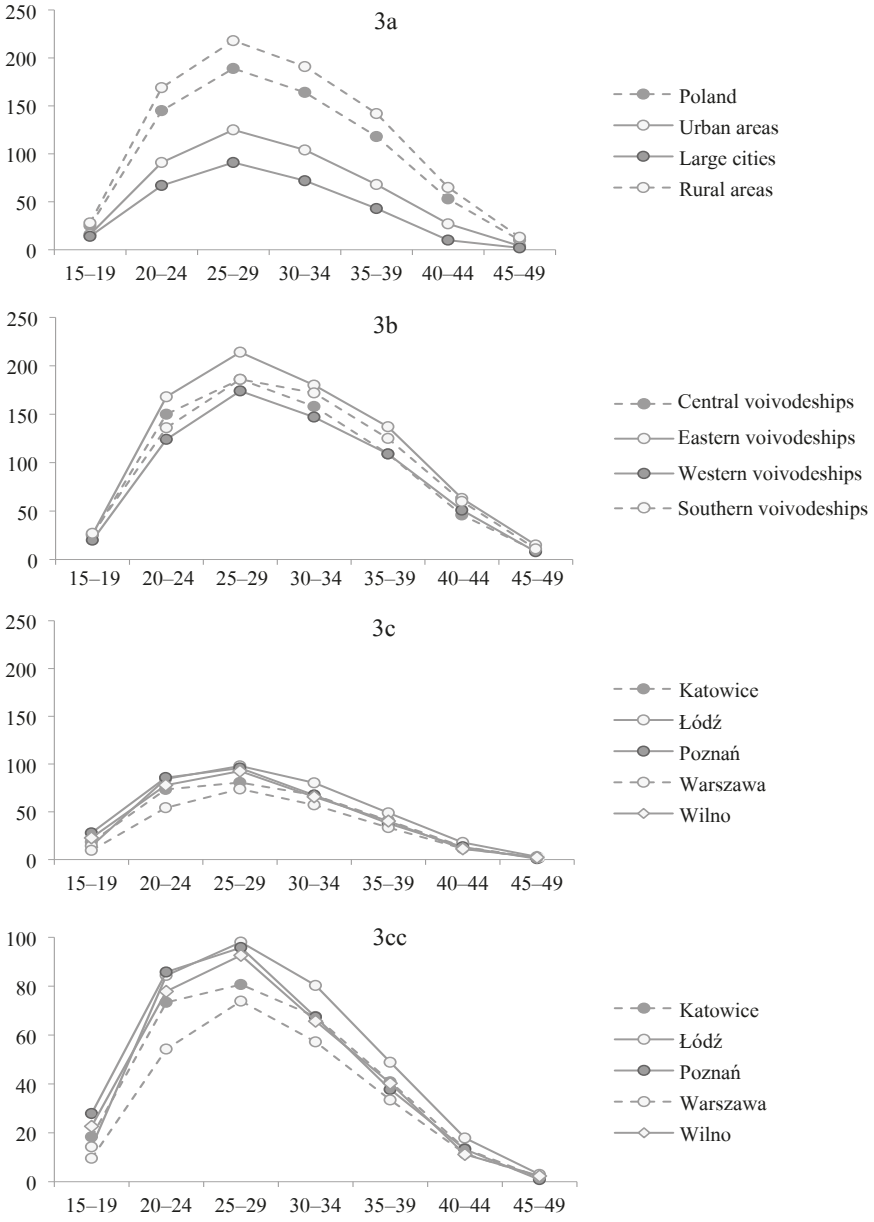


Note 1: The years of the fertility rates are stated on the graph.

Note 2: The group of large cities consists of Warszawa, Łódź, Wilno, Poznań, Kraków and Lwów.

Source: Author's own calculations based on GUS data – *Mały Rocznik Statystyczny 1939*; *Rocznik Statystyczny Wilna 1933*; *Rocznik Statystyczny Warszawy 1932*; *Rocznik Statystyczny Warszawy 1933*; *Statystyka Miasta Krakowa 1936*; *Rocznik Statystyczny Stołecznego Miasta Poznania za lata 1933–1934*; *Rocznik Statystyczny Miasta Łodzi 1928*; *Rocznik Statystyczny Miasta Łodzi 1929*; *Rocznik Statystyczny Gdyni 1933–1934*; *Rocznik Statystyczny Gdyni 1935–1936*; *Rocznik Statystyczny miasta Katowic za rok 1936*; *Rocznik Statystyczny Miasta Bydgoszczy 1932*; *Rocznik Statystyczny Miasta Bydgoszczy 1933; Drugi Powszechny Spis Ludności z dn. 9.XII.1931 r.* (results for Poland, Łódź, Poznań, Katowice, Kraków, Wilno, Warszawa, the voivodeships of wielkopolskie and pomorskie).

Figure 3a-cc. Age-specific fertility rates in Poland and selected cities, 1931–1932 (per 1,000 women)



Note: Births for Poland and urban and rural areas were calculated as averages from 1931 to 1932. Births in individual cities are averages from 1931–1932 (Bydgoszcz, Katowice, Poznań, Warszawa), 1932–1933 (Wilno), and 1928–1929 (Łódź). The age structure of women as in 1931.

Source: Author's own calculations based on GUS data – *Mały Rocznik Statystyczny 1939*; *Rocznik Statystyczny Wilna 1933*; *Rocznik Statystyczny Warszawy 1932*; *Rocznik Statystyczny Warszawy 1933*; *Rocznik Statystyczny Stołecznego Miasta Poznania za lata 1933–1934*; *Rocznik statystyczny miasta Katowic za rok 1934*; *Drugi Powszechny Spis Ludności z dn. 9.XII.1931 r.* (results for Poland, Łódź, Poznań, Katowice, Wilno, and Warszawa).

Mortality rates in interwar Poland varied across regions,[55] with the highest rates observed in southern Poland and the lowest in western Poland. This variation was also evident among the examined cities (see Figure 4). The standardized mortality rates in large cities[56] slightly exceeded the national average for the urban population and the mortality rates for medium and small towns. In most of the cities, mortality rates were lower than the rate for their group of voivodeships. In the second half of the 1930s, Kraków, Warszawa, and Poznań exhibited more favorable mortality rates compared to both their voivodeship groups and the national average. In contrast, in Gdynia and Katowice, mortality rates in 1932 were significantly higher than the average for large cities.

Poland's significantly higher mortality compared to eastern and northern European countries, and its similarity to southern and eastern European countries,[57] resulted in a relatively low average life expectancy—one of the shortest in Europe.[58] A baby born between 1931 and 1932 was expected to live an average of 49.8 years, with boys having a life expectancy of 48.2 years and girls 51.4 years. Life expectancy varied regionally: on average, residents of the largest cities could expect to live 53 years, while those in other cities had a life expectancy of 54 years. In contrast, rural areas had a lower life expectancy of 48.7 years. The mortality rate among infants was relatively high. Between 1927 and 1932, there was an average of 14–15 infant deaths per 100 live births.[59]

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[55] "In the first decades of the 20th century, typhoid fever and bacterial dysentery, which were endemic to areas east of the Vistula River, developed into extensive epidemics due to insufficient sanitation and hygiene." [translated by AM] Gawryszewski, *Ludność Polski*, 185.

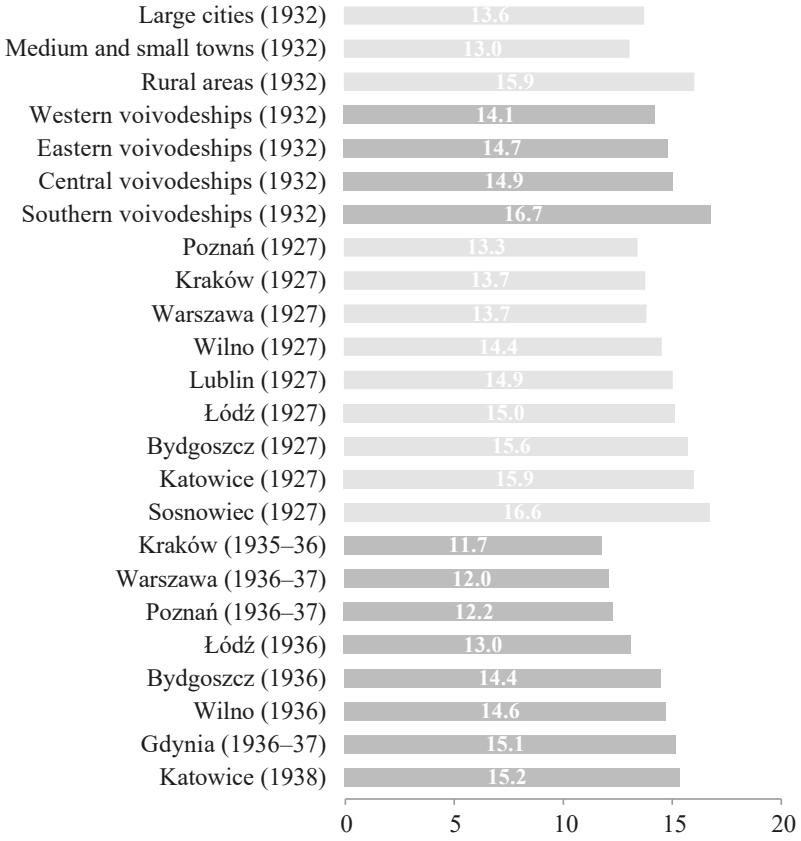
[56] "The age-standardized mortality rate is a weighted average of the age-specific mortality rates per 100,000 persons, where the weights are the proportions of persons in the corresponding age groups of the […] standard population" (UN, https://www.who.int/data/gho/indicator-metadata-registry/imr-details/78). It is a more reliable comparative tool than the crude death rate because it is not skewed by the population age structure. For example, in 1931–1932, Bydgoszcz, Gdynia, Łódź, Sosnowiec and Warszawa were similar in crude death rates, although most of the cities had different population age structures, and differed in terms of standardized mortality rates (see Tables 3 and 4, and Figure 4). In this paper the age-standardized mortality rate was calculated per 1,000 population.

[57] Standardized death rates (per 1,000 population) in selected countries in 1936 were as follows: Germany—8.0; Switzerland—8.5; Great Britain—9.8; Austria—10.6; France—10.8; Italy—12.0; Hungary—13.3; Greece—13.8; Bulgaria—14.4; Portugal—14.6; Spain—15.0; Yugoslavia—16.6; and Romania—27.2. The standard population was that of Poland in 1931. The age structures of populations in the compared countries concern the following years: Romania—1930, Yugoslavia and Great Britain—1931, Bulgaria—1934, France and Italy—1936, Germany and Austria—1939, Spain, Portugal and Greece—1940, Switzerland and Hungary—1941. Author's own calculations based on UN data (*Demographic Yearbook, 1948*).

[58] In the late 1930s, Greece and Spain had average life expectancies similar to those in Poland (48–49 years and 51–52 for male and female newborns, respectively). Bulgarian average life expectancy was lower (45.9 and 46.6 years, respectively; 1925–1928). The leaders were Sweden, Denmark, Germany, and Switzerland, where male and female newborns were expected to live around 60–63 years and 63–65 years, respectively. UN data *Demographic Yearbook 1948*.

[59] In the interwar period, Poland had one of the highest infant mortality rates in Europe. According to Rosset, it was much higher than reported, and he blamed "pre-war statistics" for

Figure 4. Standardized mortality rates for Poland, groups of voivodeships and large cities in selected years between 1927 and 1938 (per 1,000 population)



Note 1: The standard population was Poland's population in 1931. Note 2: The year of death data is stated in the table. Population age structures for Poland and cities as in 1931 (data for Gdynia is from 1936).

Source: Author's own calculations based on the GUS data – *Mały Rocznik Statystyczny 1938*; *Mały Rocznik Statystyczny 1939*; *Rocznik Statystyki Miast Polski 1928*; *Rocznik Statystyki Miast Polski 1930*; *Rocznik Statystyki Rzeczypospolitej Polskiej 1930*; *Statystyka Miasta Krakowa 1936*; *Rocznik Statystyczny Katowic. Rok 1938*; *Rocznik Statystyczny Stołecznego Miasta Poznania za lata 1937–1938*; *Rocznik Statystyczny Wilna 1937*; *Rocznik Statystyczny Warszawy 1936 i 1937*; *Rocznik Statystyczny Miasta Bydgoszczy za rok 1933*; *Mały Rocznik Statystyczny Miasta Łodzi 1936*; *Małżeństwa, urodzenia i zgony 1931, 1932*, Statystyka Polski, Seria C, vol. 102; *Rocznik Statystyczny Gdyni 1937–1938*; *Wyniki ostateczne opracowania Spisu Ludności z dn. 9.XII 1931 r. w postaci skróconej dla wszystkich województw, powiatów i miast powyżej 20000 mieszkańców Rzeczypospolitej Polskiej*.

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omitting this fact as an "inconvenient truth." Rosset, *Demografia Polski*, vol. 2, *Reprodukcja*, 405. Szulc estimated that the actual infant mortality rate between 1927 and 1928 was 17.4 deaths per 100 live births (Szulc, "Ruch," 90). The infant mortality rate calculated by Szulc appears high when measured with the scale proposed by Sarkar in 1931, where infant mortality was divided into level categories: very high (more than 20 infant deaths per 100 live births), high (15–20), medium (10–15), and low (less than 10). See Rosset, *Demografia Polski*, vol. 2, *Reprodukcja*, 380.

Despite a relatively high mortality rate, Poland's demographic situation in the 1930s was considered favorable compared to most European countries due to its positive and high rate of natural population increase. However, the steadily declining birth rate was seen as an indicator that Poland's demographic situation was moving towards that observed in Western European countries,[60] where relatively low reproduction levels co-occurred with higher proportions of older subpopulations.

Different rates of reproduction between Poland and other European countries in the interwar years were related to their being at different stages of the demographic transition,[61] with Western and Northern Europe being further along. It is believed that in Poland, the demographic transition started in the 1870s, characterized by stabilizing high birth rates and a slow but steady decline in mortality rates (by that time, Western and Northern European countries had already achieved a stage of constantly falling birth and death rates). A systematic decline in fertility in Poland is believed to have occurred at the turn of the 20th century, approximately 20–25 years later than in Western Europe. The first signs of this stage of the transition were observed in the western and southern voivodeships.[62]

Changes related to the demographic transition took place in cities earlier than in rural areas. They were "a manifestation of the adaptation of procreative behaviors to specific living conditions in the urban centers of the industrial era" and "new attitudes toward fertility," resulting in birth control, etc., which trickled into communities located near cities.[63] In Rosset's opinion,

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[60] Szulc, "Ruch," 39; Wiktor Ormicki, *Problemat ludnościowy w Polsce* (Instytut Badań Spraw Narodowościowych 1937), 12.

[61] Demographic transition theory has emerged as an attempt to describe the evolution of the population reproduction pattern, from traditional (with high birth and death rates) to modern (with low values of both rates); the process is described as "one-way, continuous and irreversible," causing a decline in fertility and mortality and extending life expectancy. A demographic transition involves changes in the age structure of the population, which contribute to its demographic aging; see Okólski and Fihel, *Demografia*, 113–121. See also Marek Okólski, ed., *Teoria przejścia demograficznego* (PWE, 1990); Krystyna Iglicka, *Terytorialne przemiany płodności w Polsce w latach 1931–1988*, (SGH, 1994): 10–13.

[62] There is disagreement in the Polish literature about when the main stage of the transition started in Poland (compare e.g., Bartosz Ogórek, "Płodność populacji II Rzeczypospolitej. Badanie przy użyciu indeksów Princeton European Fertility Project," *Roczniki Dziejów Społecznych i Gospodarczych* 72 (2012): 95–127; Szulc, "Ruch," 37–39; Iglicka, *Terytorialne przemiany*, 36, 147; Elżbieta Stańczyk, "Rodność i umieralność na ziemiach polskich w kontekście teorii przejścia demograficznego," *Wiadomości Statystyczne* 54, no. 9 (2009): 16–32; Krzysztof Zamorski, "Początki przejścia demograficznego w Polsce," *Studia Demograficzne* 2, no. 112 (1993): 15–22; Anna Podrażka, "Typy przejścia demograficznego w krajach europejskich," *Studia Demograficzne* 98 (1989): 49–73.

[63] Ogórek, "'Należy przestać spluwać dzieci na prawo i lewo!' Transformacja płodności w populacji Drugiej Rzeczypospolitej." In *Społeczeństwo międzywojenne: nowe spojrzenie*, ed. Włodzimierz Mędrzecki, and Janusz Żarnowski (Instytut Historii PAN, 2015), 93, 96. See also Tomasz Wysocki, "Zaawansowanie przejścia demograficznego w grupach narodowościowych i wyznaniowych w Polsce okresu międzywojennego," *Studia Demograficzne* 153–154 (2008): 59;

cities "had the ability to absorb new trends and new attitudes to reproduction earlier and faster."[64]

Cities had a strong presence of upper and middle-class families who consciously "controlled" the number of offspring.[65] "The higher the class, the lower the fertility, and the larger the city, the fewer the children."[66] Factors that exerted a strong influence on the number of urban births included the high cost of education for children and the increasing emancipation of women, which resulted in more of them choosing to continue their education and be economically active. Fertility rates in intelligentsia families were lower than in working-class families. While better-off families in cities had fewer children than the poorer families, in rural areas the trend was reversed. Many members of the contemporary intelligentsia and married couples chose not to have children at all.[67]

The varied course of demographic processes across Poland's regions and cities in the interwar period was also strongly related to their ethnic composition. For instance, the Jewish subpopulation, living predominantly in urban areas, exhibited distinct characteristics: it was slightly older than the general population, they had relatively lower fertility and mortality rates, they tended to marry at an older age, and they were more likely to emigrate.[68] The fertility rates for the Protestant subpopulation were also relatively low. The highest fertility rates occurred among Greek Catholics,[69] who primarily inhabited the southern voivodeships. However,

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Zofia Jabłonowska, "Rodzina w XIX i na początku XX wieku," in *Przemiany rodziny polskiej*, ed. Jadwiga Komorowska (Instytut Wydawniczy CRZZ, 1975): 58–60. In contrast with these authors, Iglicka did not think diffusion of urban procreative attitudes into the surrounding area was possible: *Terytorialne przemiany*, 47.

[64] Rosset, *Demografia Polski*, vol. 2, *Reprodukcja*, 171.

[65] It is believed that Polish interwar society consciously used various birth control methods, including delaying the age of marriage and using fertility control methods and abortions (Ogórek, "Płodność populacji," 95–127; Ogórek, "Należy przestać," 93, 96; Katarzyna Sierakowska, *Rodzice, dzieci, dziadkowie... Wielkomiejska rodzina inteligencka w Polsce 1918–1939* (Wydawnictwo DiG, 2003), 45, 101; Sylwia Kuźma-Markowska, "Stan badań nad historią antykoncepcji w XIX i XX wieku," *Przegląd Historyczny* C, no. 3 (2009): 603–19. Iglicka, *Terytorialne przemiany*, 48. See also Stanisław Borowski, "Funkcje prokreacyjne rodziny polskiej," in *Demografia społeczna*, red. Adam Józefowicz (PWN, 1974): 84–155; Stanisław Borowski, "Odraczanie potomstwa w Poznaniu w rodzinach z przełomu XIX i XX wieku oraz w bieżącym stuleciu," *Przeszłość Demograficzna Polski – Poland's Demographic Past* 5 (1972): 119–36.

[66] Jabłonowska, "Rodzina," 60.

[67] Jabłonowska, "Rodzina," 60; Sierakowska, *Rodzice*, 45, 47, 104–105.

[68] Fogelson, "Struktura," 555–88. Agnieszka Zielińska, "Rodzina żydowska w XIX i na początku XX wieku," in *Struktury demograficzne rodziny na ziemiach polskich do połowy XX wieku. Przegląd badań i problemów*, ed. Piotr Guzowski and Cezary Kuklo (Instytut Badań nad Dziedzictwem Kulturowym Europy, 2014), 79–92; Wysocki, "Zaawansowanie," 62.

[69] Iglicka, *Terytorialne przemiany*, 55; Gawryszewski, *Ludność Polski*, 159; Zamorski, *Transformacja*, 91.

this group also showed relatively high mortality rates, partly attributed to their "low economic and societal status."[70]

Conclusion

In the interwar period, the population potential of the largest urban centers in Poland was relatively high. It expanded due to the massive inflow of new, mainly working-age residents and a natural increase. Before World War II, large cities accounted for 38% of the urban population and 11% of the total population in the country.

Demographic structures and reproduction processes differed significantly from those of the country as a whole, with substantial differences occurring between large cities. Cities that were already large or regionally important urban centers in partitioned Poland exhibited different population structures and reproduction trends to those that experienced intense economic growth and in-migration in the interwar period. This first group of cities (especially Warszawa, Kraków, Wilno, and Lwów) had relatively older populations and lower levels of reproduction, particularly due to fertility rates below the population replacement rate, than cities in the second group (such as Gdynia, Katowice, and Chorzów). However, both groups were similar in that they had more births than deaths, with the ratio being the highest in Gdynia and the lowest in Lwów, Kraków and Warszawa (1927–1932).

The demographic structures of most large cities differed from those that characterized the general urban population. In addition to having a higher percentage of people aged 20–39, who are the core labor force, primarily due to in-migration, large cities also had lower percentages of children and young people than the urban average. Gdynia had the youngest population age structure in that group.

Other demographic aspects also distinguished Gdynia from other large cities. A high surplus of births over deaths had a positive effect on Gdynia's population potential and suggested further growth. The situation largely resulted from the city's age structure: the percentage of people aged 20–39, i.e., in their prime of life and likely to reproduce, was high; the age structure of children aged 0–9 was also high; older people accounted for a small portion of the city's population.

[70] Gawryszewski, *Ludność Polski*, 177; Konrad Wnęk, "Przemiany demograficzne we Lwowie w latach 1829–1938," *Zeszyty Naukowe UJ. Prace Historyczne* 135 (2008): 122; Wysocki, "Zaawansowanie," 62.

However, Gdynia also had the problem of a relatively high mortality rate, especially among infants and young children. This was likely due to the poor living conditions, which were associated with insufficient infrastructure in a city that was still under development.

Most of the cities examined in this study were the capitals of their voivodeships (Białystok, Katowice, Kraków, Lublin, Lwów, Łódź, Poznań, Warszawa and Wilno), which significantly influenced the pace of their development. The attractiveness of urban areas for new residents largely depended on employment opportunities that were primarily available in Gdynia and highly industrialized cities with well-developed manufacturing sectors and heavy industry (such as Katowice, Chorzów, Częstochowa and Sosnowiec).[71] Łódź, Białystok, and Bydgoszcz were also industrialized cities in the interwar years, while Poznań and Warszawa were important economic centers. The other cities in the study were poorly industrialized or had no industry at all. The core business sectors in those cities were represented by services, trade, and crafts. Kraków, Lwów, Poznań, Warszawa and Wilno had the status of the largest centers of academia and culture in interwar Poland.

[71] The socio-economic aspects of these cities and others in Poland are discussed in Kwiatek and Lijewski, *Leksykon*; Lech Krzyżanowski, "Pierwsze lata województwa śląskiego w II RP," *Biuletyn IPN* 9, no. 142 (2017): 5–18; Edward Rosset, *Łódź – miasto pracy* (Wydawnictwo Magistratu M. Łodzi, 1929); Maria Nietyksza, *Ludność Warszawy na przełomie XIX i XX wieku* (PWN, 1971); Zygmunt Słomiński, *Gospodarka Warszawy w dobie kryzysu 1930–1934* (Drukarnia Piotr Pyz i S-ka, 1935). Andrzej Gawryszewski, *Ludność Warszawy w XX wieku* (IGiPZ PAN, 2009); Marek Chamot, "Dziedzictwo kulturowe Bydgoskiego Węzła Wodnego," in *Dziedzictwo przemysłowe Bydgoszczy – nadzieje i dylematy*, ed. Rafał Nowicki (Wydawnictwo Uczelniane WSG, 2018) 33–40.

APPENDIX

Table A1. Coefficients of similarity of population age structures for Poland and the most populous cities, 1931 (%)

	Poland—urban areas	Białystok	Bydgoszcz	Chorzów	Częstochowa	Gdynia	Katowice	Kraków	Lublin	Lwów	Łódź	Poznań	Sosnowiec	Warszawa	Wilno
Urban areas	100,0	97.2	97.7	97.9	97.3	85.5	96.2	93.9	98.6	92.4	96.6	94.6	97.5	94.5	96.5
Białystok	97.2	100.0	96.9	97.4	94.9	84.9	95.8	94.3	96.6	94.1	97.7	95.6	95.1	95.9	98.0
Bydgoszcz	97.7	96.9	100.0	97.3	96.7	87.4	97.0	92.5	97.2	91.7	96.4	96.4	97.1	94.5	95.6
Chorzów	97.9	97.4	97.3	100.0	96.4	85.8	96.7	93.7	97.5	92.7	97.1	95.0	97.1	94.5	96.5
Częstochowa	97.3	94.9	96.7	96.4	100.0	84.5	94.7	91.5	97.5	90.0	94.8	93.5	97.3	92.3	94.1
Gdynia	85.5	84.9	87.4	85.8	84.5	100.0	87.6	83.9	84.7	84.5	85.8	88.0	87.1	85.5	84.5
Katowice	96.2	95.8	97.0	96.7	94.7	87.6	100.0	93.5	95.6	92.3	96.3	97.4	97.1	95.1	95.3
Kraków	93.9	94.3	92.5	93.7	91.5	83.9	93.5	100.0	93.2	98.1	94.9	94.6	92.7	96.0	95.1
Lublin	98.6	96.6	97.2	97.5	97.5	84.7	95.6	93.2	100.0	91.7	96.3	94.4	97.2	94.0	95.8
Lwów	92.4	94.1	91.7	92.7	90.0	84.5	92.3	98.1	91.7	100.0	95.2	94.6	91.2	96.8	95.8
Łódź	96.6	97.7	96.4	97.1	94.8	85.8	96.3	94.9	96.3	95.2	100.0	96.5	96.0	97.3	98.6
Poznań	94.6	95.6	96.4	95.0	93.5	88.0	97.4	94.6	94.4	94.6	96.5	100.0	95.2	96.8	95.8
Sosnowiec	97.5	95.1	97.1	97.1	97.3	87.1	97.1	92.7	97.2	91.2	96.0	95.2	100.0	93.5	94.7
Warszawa	94.5	95.9	94.5	94.5	92.3	85.5	95.1	96.0	94.0	96.8	97.3	96.8	93.5	100.0	97.0
Wilno	96.5	98.0	95.6	96.5	94.1	84.5	95.3	95.1	95.8	95.8	98.6	95.8	94.7	97.0	100.0

Source: Author's own calculations based on GUS, *Drugi Powszechny Spis Ludności z dnia 9 XII 1931 r.*; GUS, *Mały Rocznik Statystyczny 1939*.

Table A2. Population in Poland and its most populous cities by religion and first language in 1931 (%)

	Religious affiliation							First language							
	Roman Catholic	Greek Catholic	Orthodox	Protestant	Jewish	Other	Unknown	Polish	Ukrainian	Ruthenian	Belorussian	Russian	German	Yiddish and Hebrew	Other/Not given
Poland	64.8	10.4	11.8	2.6	9.8	0.5	0.1	68.9	10.1	3.8	3.1	0.4	2.3	8.6	2.8
Urban areas	63.7	3.7	2.2	2.8	27.3	0.2	0.1	68.4	2.1	1.1	0.4	0.6	2.6	24.3	0.5
Białystok	45.6	0.0	8.2	2.9	43.0	0.3	0.0	50.9	0.0	0.0	0.0	3.6	2.1	42.6	0.8
Bydgoszcz	88.4	0.0	0.0	9.1	1.5	1.0	0.0	89.3	0.0	0.0	0.0	0.0	9.6	0.0	1.1
Chorzów	92.2	0.0	0.0	4.8	2.8	0.2	0.0	87.0	0.0	0.0	0.0	0.0	11.7	1.1	0.1
Częstochowa	77.1	0.0	0.0	0.0	21.9	1.0	0.0	78.9	0.0	0.0	0.0	0.0	0.0	20.6	0.4
Gdynia	95.8	0.4	0.5	1.0	1.9	0.0	0.2	98.3	0.1	0.0	0.0	0.1	0.5	0.5	0.5
Katowice	89.8	0.0	0.0	5.1	4.5	0.5	0.1	84.9	0.0	0.0	0.0	0.0	13.4	1.3	0.4
Kraków	72.7	0.7	0.1	0.5	25.8	0.1	0.1	78.1	0.3	0.1	0.0	0.1	0.3	20.9	0.2
Lublin	63.7	0.0	0.0	0.0	34.7	1.5	0.1	65.5	0.0	0.0	0.0	0.0	0.0	33.8	0.5
Lwów	50.3	16.0	0.4	1.2	31.9	0.1	0.1	63.5	7.7	3.5	0.0	0.2	0.8	24.1	0.2
Łódź	56.3	0.1	0.3	9.3	33.5	0.4	0.1	59.0	0.0	0.0	0.0	0.2	8.9	31.7	0.2
Poznań	96.1	0.2	0.2	2.6	0.8	0.1	0.0	96.6	0.1	0.0	0.0	0.1	2.6	0.4	0.2
Sosnowiec	79.5	0.0	0.0	0.0	19.1	1.4	0.0	81.9	0.0	0.0	0.0	0.0	0.0	17.6	0.5
Warszawa	66.9	0.1	0.8	1.8	30.1	0.1	0.2	70.5	0.1	0.0	0.1	0.3	0.2	28.4	0.4
Wilno	64.5	0.2	4.8	0.9	28.1	1.4	0.1	65.9	0.0	0.1	0.9	3.8	0.3	28.0	1.0

Source: Author's own calculations based on GUS, *Drugi Powszechny Spis Ludności z dnia 9 XII 1931 r.*; GUS, *Mały Rocznik Statystyczny 1939.*

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The Population Potential of the Largest Cities in the Second Polish Republic

Summary

The article analyses the most populous cities in interwar Poland, focusing on population size, reproduction rates, and socio-demographic structure. These characteristics provide insight into the cities' population potential. The cities varied in the sex and age structure of their populations, as well as in reproduction rates, which were also different from those in the country and in voivodeships. Cities that had been large or regionally important urban centers during the Partition period differed in population structure and reproduction rates from urban areas, which experienced rapid economic development during the Second Polish Republic. The demographic structure of most large cities differed from national patterns. The main difference was the higher percentages of people 20–39, the core working-age population, which was mainly the result of the migration influx. Additionally, these cities consistently maintained higher birth-to-death ratios compared to national averages. The main source of data used in the research was the GUS (Central Statistical Office) publications, which contained the results of the 1921 and 1931 censuses, as well as population registers from selected interwar years.

Potencjał ludnościowy największych miast Drugiej Rzeczypospolitej Polskiej

Streszczenie

W artykule przedstawiono syntetyczną charakterystykę najludniejszych miast Polski okresu międzywojennego (tj. liczących w 1939 r. co najmniej 100 tys. mieszkańców) z punktu widzenia stanu, struktur populacji według wybranych cech społeczno-demograficznych, a także reprodukcji ludności. Charakterystyki te opisują w sposób bezpośredni potencjał ludnościowy tych miast lub stanowią istotne determinanty go kształtujące. Uzyskane rezultaty wykazały odmienność analizowanych miast w kształtowaniu się struktur ludności według płci i wieku oraz przebiegu procesu reprodukcji względem sytuacji w kraju i regionach, a także pomiędzy poszczególnymi ośrodkami. Nieco inaczej kształtowały się struktury ludnościowe i reprodukcja w miastach stanowiących duże lub znaczące w regionie ośrodki miejskie jeszcze za czasów zaborów, a inaczej w miastach intensywnie rozwijających się

gospodarczo w okresie II RP, z silnym napływem migracyjnym. Struktury demograficzne populacji większości miast wielkich różniły się od struktur ogólnokrajowej średniej miejskiej. Różnice te przejawiały się przede wszystkim w wyższym odsetku subpopulacji w wieku 20–39 lat, stanowiącej filar zasobów pracy, co było głównie efektem napływu ludności. Wszystkie rozpatrywane ośrodki legitymowały się przewagą liczby urodzeń nad liczbą zgonów. Podstawowe źródło danych dla prowadzonych rozważań stanowiły publikacje Głównego Urzędu Statystycznego zawierające wyniki spisów powszechnych z lat 1921 i 1931 oraz zweryfikowane informacje z zakresu rejestracji bieżącej z lat 1927–1932.

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Electronic Version of Aleksander Maciesza's 1907 *Statistical Atlas of the Polish Kingdom*

Elektroniczna wersja *Atlasu statystycznego Królestwa Polskiego* Aleksandra Macieszy z 1907 roku

Abstract

The article outlines the origins and significance of Aleksander Maciesza's *Atlas*, as well as the methodological assumptions for the production of its electronic version. The *Statistical Atlas of the Polish Kingdom*, compiled by Aleksander Maciesza, was published in 1907. It was an innovative work for the country; it was the first time that the cartographic method, which had been in use for 80 years, was employed to present spatial phenomena. The author intended that, through its new, illustrative form, the *Atlas* would contribute to the dissemination of demographic and socioeconomic knowledge of the Kingdom among broad sections of society. However, although it was well received, its poor graphic design and editorial shortcomings prevented it from gaining wider popularity, and it soon had

Abstrakt

W artykule przedstawiono genezę i znaczenie *Atlasu statystycznego Królestwa Polskiego* w opracowaniu Aleksandra Macieszy, wydanego w 1907 roku, oraz metodologiczne założenia opracowania jego wersji elektronicznej. *Atlas* był nowatorskim dziełem na gruncie polskim, po raz pierwszy bowiem konsekwentnie zastosowano w nim, znaną już od 80 lat, metodę kartogramu do prezentacji zjawisk przestrzennych. W zamyśle autora dzięki swej nowej, sugestywnej formie miał przyczynić się do popularyzacji wiedzy o stosunkach demograficznych i społeczno-ekonomicznych Królestwa wśród szerokich warstw społeczeństwa. Jednakże, aczkolwiek przyjęty życzliwie, z uwagi na ubogą szatę graficzną i niedoskonałości edytorskie nie cieszył się dużą popularnością i szybko

only the value of a historical source. Modern computer technology makes it possible to compensate for all these graphical shortcomings and to enhance the maps with new analytical tools, which was the incentive for creating the electronic version.

Keywords

Statistical cartography, data presentation, spatial analysis, statistical data visualization, Aleksander Maciesza

zyskał już tylko walor źródła historycznego. Współczesna technologia komputerowa pozwala wszystkie te niedostatki graficzne zniwelować oraz wzbogacić mapy o nowe narzędzia analityczne, co było asumptem do opracowania jego wersji elektronicznej.

Słowa kluczowe

kartografia statystyczna, prezentacja danych, analiza przestrzenna, wizualizacja danych statystycznych, Aleksander Maciesza

Origins, Methodological Background and Reception of Aleksander Maciesza's 1907 Atlas

The idea of mapping spatial statistics using cartographic methods has a worldwide history of almost two centuries. In 1826, Baron Pierre Charles Dupin published a map showing the state of education in France (number of inhabitants per pupil). It is widely considered to be the world's first modern statistical map. It was a choropleth map in which shading (with no class designations) from black to white indicated the distribution and intensity of the subject in all 85 départements. With its help, it was possible to indicate the enlightened (lighter) and underdeveloped (darker) regions of France.[1] Three years later, Adriano Balbi and André-Michel Guerry used a juxtaposition of three thematic choropleths for comparative analysis. The aim was to show the correlation between property and personal crimes and the level of education in the different French départements. As will be shown later, attempts to draw conclusions based on collective correlations in relation to individual cases suffered from a serious theoretical flaw. In fact, the relationship (or lack thereof) between crime and education observed at the aggregate level would need to be tested at the individual level.[2] Nevertheless, this was not the first time

[1] A detailed analysis of Dupin's map was given by Jolanta Korycka-Skorupa and Jacek Pasławski, "The Beginnings of the Choropleth Presentation," *Polish Cartographical Review* 49, no. 4 (2017): 187–98, https://doi.org/10.1515/pcr-2017-0012.

[2] Gilles Palsky, "Connections and Exchanges in European Thematic Cartography: The Case of 19th Century Choropleth Maps," *Belgeo* 3–4 (2008): 413–26, https://doi.org/10.4000/belgeo.11893, section 17.

that maps were used for comparative spatial analysis of multiple issues.[3] In 1885, Emile Levasseur published a color choropleth map of world population density.[4] Thus, the cartographic method emerged from its preliminary stage and definitively entered the studios of cartographers.

Prior to the development of the fundamentals of the main methods of cartographic representation, in Poland content of a statistical nature was directly attached to administrative or general geographic maps in the form of relevant tables or verbal descriptions. Such a method was used in the first Polish atlases and statistical maps, e.g., by Wawrzyniec Marczyński,[5] Ludwik Plater,[6] Juliusz Kolberg,[7] Franciszek Rodecki,[8] and Jędrzej Słowaczyński.[9] Thus, all these works contain statistical content, which is presented next to the underlying map as a set of thematically defined numerical values. However, there is no visualization of this data in the form of a thematic layer of the map. A forerunner in this field was Aleksander Maciesza, who in 1907 published his *Atlas statystyczny Królestwa Polskiego. Zobrazowanie poglądowe stanu zaludnienia, warunków zdrowotnych, oświaty, stosunków rolnych i stanu ludności robotniczej w Królestwie* (Statistical Atlas of the Polish Kingdom: Viewing the State of the Population, Health Conditions, Education, Agricultural Relations and the State of the Working Population in the Kingdom).[10] In many respects, this work was a rarity in the Polish

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[3] Waldemar Spallek, "Historia metod wizualizacji danych statystycznych," in *Główne problemy współczesnej kartografii 2011. Zastosowanie statystyki w GIS i kartografii*, ed. Waldemar Spaller, and Wiesława Żyszkowska (Uniwersytet Wrocławski, Zakład Kartografii, 2011) 18, https://www.researchgate.net/profile/Waldemar-Spallek/publication/314764006_Historia_metod_wizualizacji_danych_statystycznych_History_of_statistical_data_visualisation_methods/links/58c5d65592851c0ccbfb9764/Historia-metod-wizualizacji-danych-statystycznych-History-of-statistical-data-visualisation-methods.pdf.

[4] Émile Levasseur, "La Statistique Graphique," in *Jubilee Volume of the Statistical Society of London* (E. Stanford, 1885), 2–34, https://www.datavis.ca/milestones/uploads/files/levasseur/Levasseur-StatistiqueGraphique.pdf.

[5] Wawrzyniec Marczyński, *Statystyczne, topograficzne i historyczne opisanie gubernii podolskiey z rycinami i mappami*, vol. 1–2 (Drukiem Józefa Zawadzkiego, vol. 1 – 1820, vol. 2 – 1823), https://mbc.cyfrowemazowsze.pl/dlibra/publication/21378/edition/17599; https://www.sbc.org.pl/dlibra/publication//10526/edition/10220.

[6] Ludwik Plater, *Atlas statystyczny Polski i krajów okolicznych* ([s.n.], 1827), https://www.bibliotekacyfrowa.pl/dlibra/publication/30529/edition/38573.

[7] Juliusz Colberg, *Atlas Królestwa Polskiego składający się z 8 map jeograficznych, z których każda wystawia jedno Województwo, jako to: Krakowskie, Sandomierskie, Kaliskie, Lubelskie, Płockie, Mazowieckie, Podlaskie i Augustowskie* ([s.n.], 1827).

[8] Franciszek Rodecki, *Obraz jeograficzno-statystyczny Królestwa Polskiego* (W Drukarni Antoniego Galęzowskiego i Kompanii, 1830).

[9] Jędrzej Słowaczyński, *Petit atlas des pays Polonais* (Auguste Logerot, 1844).

[10] Aleksander Bolesław Maciesza and Konrad Obuchowski, *Atlas statystyczny Królestwa Polskiego. Zobrazowanie poglądowe stanu zaludnienia, warunków zdrowotnych, oświaty, stosunków rolnych i stanu ludności robotniczej w Królestwie* (Drukarnia K. Miecznikowskiego, 1907).

circumstances of the time. First of all, the unusual character of the author should be noted. He was a well-known social and educational activist in Płock. An ophthalmologist by profession, he was actively involved in improving the health of the population. He was also politically engaged—in 1906 he was a Democratic National Party deputy to the First Duma. He was also involved in scientific activities in many fields. After the revival of the Scientific Society of Płock on his initiative in 1907, he became its first president. He was also known for his national and patriotic views.[11]

Indeed, he saw the fulfillment of his patriotic duty in taking the trouble to compile and publish the atlas at his own expense.[12] He wrote in the introduction, "A thorough knowledge of the economic conditions of one's own country is vital to every good citizen."[13] He believed that enriching the existing tabular statistics (which were usually boring for the average reader) with elements of illustrative graphics could greatly improve the popularization of statistical knowledge among the general public. Here he was referring to the views of the abovementioned famous French economist and statistician Émile Levasseur, a forerunner of the introduction of illustrative graphics in school textbooks, starting with elementary schools. In Maciesza's concept of the atlas as a whole, it was to have an illustrative rather than an exploratory function, for he concluded his introduction with the following lines: "The reader, who does not have the detailed text before him, will be forced to look closely at the choropleths and diagrams and to compare them with each other. None of them should be encouraged to carry out further economic studies in order to clarify the questions that arise. Then the *Atlas* will achieve its goal—popularization of statistical knowledge and the deepening of knowledge of our country."[14]

The sources for the *Atlas* were mostly official government publications, in particular the results of the 1897 census and the work of the Warsaw Statistical Committee. However, the author did not use them uncritically. Below the table of the Polish population in 1897 he added a disclaimer: "The data for the eastern counties of the Kingdom are highly inaccurate, as they were collected during a biased one-day census."[15] In 1906, he made a similar note on the Protestant population table: "The figures for the eastern counties of the Kingdom do not correspond to reality."[16]

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[11] Czesław Brzoza and Kamil Stepan, "Maciesza Aleksander," in *Posłowie polscy w parlamencie rosyjskim 1906–1917. Słownik biograficzny* (Wydawnictwo Sejmowe, 2001).

[12] For this reason, Dorota Borowicz even classifies the *Atlas* as a cartographic publication with a clearly pro-Polish and pro-national propaganda message. See Dorota Borowicz, "Dawne mapy przedmiotem manipulacji i narzędziem propagandy," *Z Dziejów Kartografii* 21 (2017): 190.

[13] Maciesza and Obuchowski, *Atlas statystyczny*, *7.*

[14] Maciesza and Obuchowski, *Atlas statystyczny*, *7.*

[15] Maciesza and Obuchowski, *Atlas statystyczny*, Table III.

[16] Maciesza and Obuchowski, *Atlas statystyczny*, Table VI.

This means that he tried to verify the data he collected with the methods available to him. When he became a Duma deputy in 1906, he took advantage of his stay in the capital and access to state institutions to collect materials that would later be useful in his work on map design.[17]

In designing his atlas, Maciesza was guided by the achievements of world cartography. He knew and appreciated[18] e.g., the huge multi-volume annual series, *Album de Statistique Graphique* (Album of Graphic Statistics), published for 20 years (1879–1899) under the editorship of Émile Cheysson. The series used all the forms of graphic representation known in cartography at the time to present data related to transportation planning (railroads, canals, ports, trams, etc.). It was the crowning achievement and epitome of the so-called "golden age of statistical graphics."

As already mentioned, Aleksander Maciesza had no education in economics or cartography. Despite the fact that he was self-taught in these disciplines, he successfully managed to anticipate the methodological requirements for the publication of a topical atlas, which were formulated much later. He perfectly understood that this was a separate, specific type of cartographic production, consisting of a systematic collection of maps with appropriately selected content and layout. Together, this collection should form a methodically and content-wise closed and logically consistent whole. An important issue is also the uniformity of cartographic features, consisting of (a) the appropriateness of the choice of cartographic projections and their least possible variety, (b) identical scales or a consistent number of them; in any case, it is desirable to have the least possible variety of them for easy comparison of maps, (c) the most uniform possible cartographic methods for specific subjects, (d) the same degree of generalization, (e) the chronological unity of the subjects presented, (f) a uniform graphic page (frames, descriptions, colors, layout of the legend, arrangement of the map area, etc.).

In his work he managed to preserve the most important features of atlases, uniformity, understood as the inclusion of all aspects arising from the theme and purpose of the work, and internal unity, meaning the logical sequence and mutual complementarity of individual maps.[19]

Lack of support from external scientific institutions forced Maciesza to finance the publication himself, which probably limited its layout and the number of issues covered. Proofs according to his design were made by Konrad Obuchowski with

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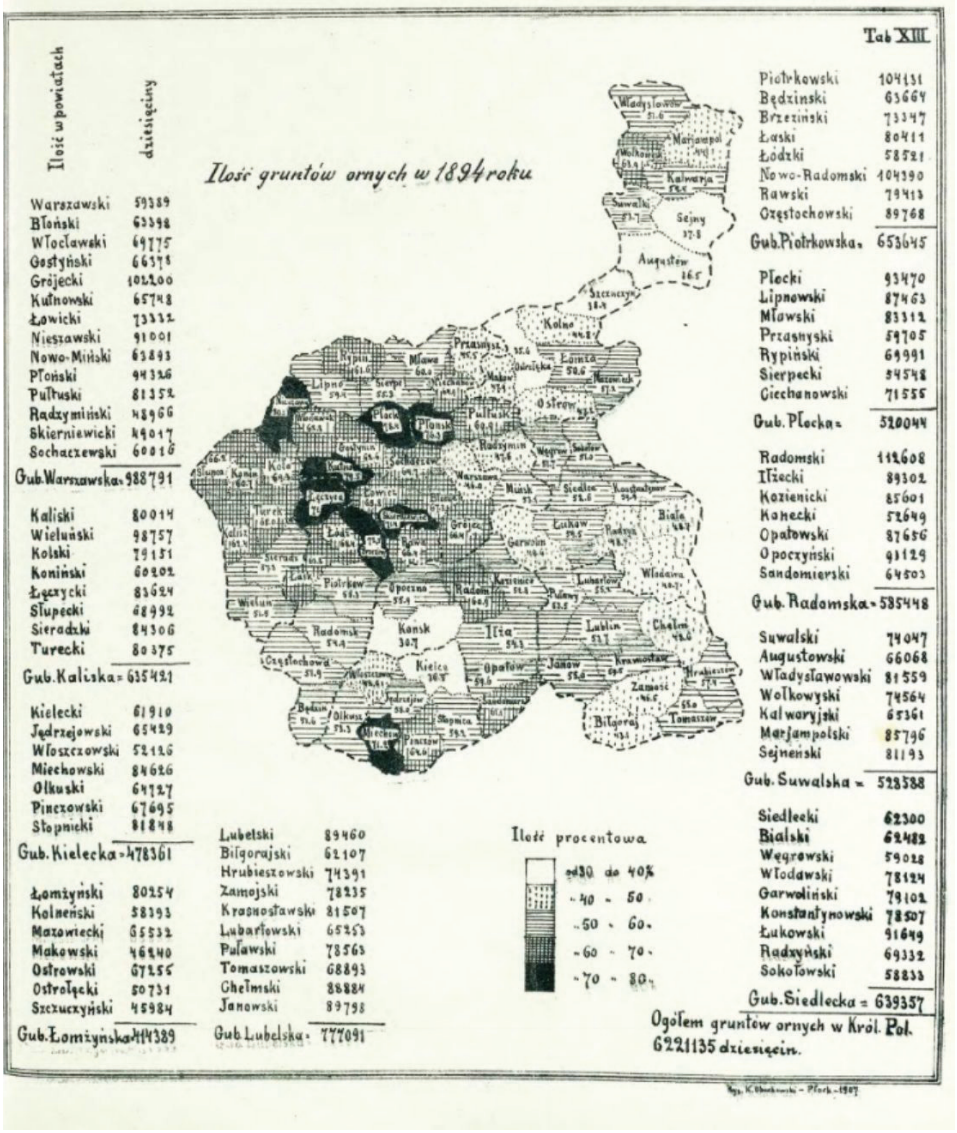
[17] Ryszard Pachecka and Stanisław Palczewski, "Doktór Aleksander Maciesza – pasje i zainteresowania (w setną rocznicę urodzin 1875–1975)," *Notatki Płockie. Kwartalnik Towarzystwa Naukowego Płockiego* 20, no. 3/82 (1975): 32–36, https://docplayer.pl/27823724-Doktor-aleksander-maciesza-pasje-i-zainteresowania.html.

[18] Maciesza and Obuchowski, *Atlas statystyczny*, *7.*

[19] The features of the Atlas as a cartographic publication are adapted from Lech Ratajski, *Polska kartografia ekonomiczna XX wieku* (PWN, 1965): 30.

lithography by J. Sommering. The whole book was printed in Kazimierz Miecznikowski's printing house in Płock.

Figure 1. An example of a choropleth map from the *Statistical Atlas of the Polish Kingdom*



Source: Public domain. Digital Repository of Scientific Institutes, https://rcin.org.pl/dlibra/publication/11109/edition/2672/content.

The *Atlas* consists of 32 thematic tables containing choropleths and, in the margins, grouped by governorates, absolute data from individual districts or supplementary diagrams. In 30 cases these are simple choropleths in which the class ranges of the statistical data have been visually differentiated by hatching. The units of administrative division—districts, of which there were 84 in the Kingdom of Poland at that time—were used as reference points. In the case of tables on education and the number of workers, structural diagram maps were used, which referred to the area of individual governorates. The maps were drawn at a uniform scale of 1:3,400,000.[20] According to the modern classification, the entire *Atlas* is classified as a population atlas, while of the 32 diagram maps that constitute it, 19 are classified as population maps and 13 as agricultural maps.[21] Each of the tables is preceded in the descriptive section by a separate note indicating the source base used and, in many cases, additional statistical data that could not be presented in a choropleth map or diagram. The author has also included his own comments and interpretations of the published data.

Despite the fact that the *Atlas* was published in Płock, then a provincial gubanatorial town, far from leading scientific centers, it was quickly picked up by popular and scientific journalism. A critical review of the *Atlas* was published in the pages of the widely read Warsaw weekly *Świat* by Adam Zakrzewski, a well-known economic columnist at the time, who was also involved in statistics. He stated at the outset that in the conditions available to Maciesza it was not possible to fully achieve the stated goals of the publication. Formal objections mainly concerned the lack of color printing and the substitution of color by hatching. According to Zakrzewski, this technique can be used to illustrate the division of data into no more than 3 or 4 quantitative categories. Beyond that, the choropleths become difficult to read. Only 7 of the 32 tables in the *Atlas* met this requirement. The reviewer therefore suggested limiting the number of compartments in most of the remaining choropleths. Zakrzewski, however, raised much more serious objections to the source base used and partly to its interpretation by Maciesza in his comments and information for individual tables. He reiterated objections to the methodology and results of statistical data collection by official government agencies that were already well known in the circles of economists and demographers at the time, such as the inclusion of the non-permanent population in the population of certain areas, the disruption of ethnic and religious affiliations by the army stationed on

[20] Anna Osowska, "Polskie atlasy tematyczne do 1939 roku w zbiorach Uniwersytetu Wrocławskiego," in *Od atlasu do kolekcji: w 440. rocznicę i wydania atlasu Abrahama Orteliusa*, ed. Jerzy Ostrowski and Radosław Skrycki (Instytut Historii Nauki PAN, 2011), 228.

[21] A detailed description of all the tables in the *Atlas* was given by Lucyna Szaniawska, *Mapy Królestwa Polskiego wydane w latach 1815–1915 w zbiorach Biblioteki Narodowej* (Wydawnictwo Biblioteki Narodowej, 1997), 115–120.

the territory of the Kingdom (more than 250,000 soldiers) or by foreigners and workers imported in large numbers from the Empire (almost 350,000 inhabitants were born on the territory of the Empire), and the omission of the noble population from the figures relating to the landless peasants. In all these cases, according to the reviewer, the author of the *Atlas* was too uncritical. Another negative comment was that the Russian measures were not converted into Polish standards and that the alphabetical lists were not arranged according to the Polish alphabet, but according to Russian sources. However, the final result of the review was positive. In his conclusion, Zakrzewski wrote, "In spite of the shortcomings, Dr. Maciesza's work is a first attempt to give the reader an idea of the economic relations of the Kingdom, even if only in the most general outlines and with such accuracy as is possible with the data currently available to us."[22]

The appearance of the *Atlas* on the publishing market was also noted by a serious scientific journal, the quarterly *Ekonomista*, published in Warsaw. Issue III of 1907 contained a detailed review of the *Atlas*. In the introduction, the author [W.B.] emphasized the novelty of Maciecha's work on Polish soil, as he was the first to present statistical issues in an "artistic manner" using choropleths and diagrams. In his opinion, this was the best way to popularize "dull and dry" numerical data related to many "national affairs." At the same time, he excused the creators of the *Atlas* for its modest graphic design, especially the lack of color printing found in foreign publications of this type. This was due to the lack of institutional support and, consequently, of adequate academic, financial, and technical facilities. In the opinion of the reviewer, the author of the *Atlas* deserved all the more credit for undertaking this effort under such unfavorable circumstances. After the presentation of all 32 themes presented in the individual choropleths, an analysis of the underlying source base was made. In particular, the reliability of the official data of the one-day census of 1897 and the materials of the Warsaw Statistical Committee, which were problematic in many respects, was noted. Giving examples of blatant errors in these documents (differences in the methodology of determining the population and its individual social groups—landless peasants, misidentification of the main group of purchasers of landed estates, data on American emigration, excessive number of cattle owned by peasants), the reviewer emphasized that this data was the only evidence available at the time and "when presenting statistical statistics, one must use it, whether one likes it or not." Rejecting it would have made it impossible to produce this type of publication. In conclusion, he once again emphasized the considerable contribution of Maciesza to the popularization of the "statistical affairs"

[22] Adam Zakrzewski, "Ze statystyki Królestwa ('Atlas statystyczny' d-ra Al. Macieszy)," *Świat* 40 (1907): 12–14.

of the Kingdom of Poland, and considered that his atlas could be recommended to all those interested in the economic affairs of the country.[23]

The publication of the *Atlas* also aroused the interest of the Polish-language daily press outside the Kingdom of Poland. The *Kurier Litewski* (Lithuanian Courier), published in Vilnius, in its issue of December 2, 1907, included an extensive (for the size of the paper) discussion of the *Atlas*'s contents. The author emphasized that it was the first time in the Polish lands that "an illustrative method, i.e., choropleths and diagrams, has been used for the presentation of complex socio-economic topics, which should contribute to the popularization of these issues among broad sections of society." In the following section, based on the abundant statistical data, groups of topics in the *Atlas* were presented one by one, starting with the population, ethnic and religious affiliation, the number of working people, the state of education and health care, emigration figures, and ending with issues of the general agrarian economy and social relations in the countryside. The author of the discussion was aware of the inadequacies of part of the *Atlas*'s source base, but decided to use the statistical data taken from it. As a result, the reader received something like a modest compendium of knowledge about social and economic conditions in the Kingdom of Poland at the turn of the 20th century. The reviewer also appreciated the enormous amount of work required to develop and publish the *Atlas*, and expressed the belief that it should find "widespread support" among the Polish public.[24]

Despite the essentially positive conclusions of the reviews, the author never returned to mapmaking and statistics on a wider scale. It may well be that he nevertheless felt disappointed and discouraged by the response to his work. As a result, he did not carry out his original intentions of periodically publishing more volumes of the *Atlas* in the following years.[25]

His work has left a permanent mark in the history of Polish cartography. The innovation of Maciesza's work is proved by the fact that the choropleths of the *Atlas* on population density of 1897 and 1906 are among the oldest studies of this kind in Poland.[26] Lech Ratajski, a prominent Polish cartographer, recognized the publication's graphic shortcomings, but underlined the very wide thematic scope of Maciesza's *Atlas* and the fact that, despite the lack of a broader scientific background, the author had methodically worked out a large number of issues.[27]

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[23] W.B., "Doktór Aleksander Maciesza. Atlas Statystyczny Królestwa Polskiego," *Ekonomista* 3 (1907): 435–37.

[24] "Atlas statystyczny Królestwa Polskiego," *Kurier Litewski* 271, no. 2/15 (1907): 3–4.

[25] Halina Klepurska, "Maciesza Aleksander," in *Polski Słownik Biograficzny* (1974): 78.

[26] Marek Jerczyński, "Polskie mapy rozmieszczenia ludności. Charakterystyka i przegląd bibliograficzny," *Dokumentacja Geograficzna* 4 (1965): 17–18.

[27] Lech Ratajski, "Polska kartografia," 38.

Bogdan Horodyski also noted that the conspicuous errors in the delimitation of some classes and interval variations, as well as the manuscript, almost artisanal method of map layout, in relation to today's state of knowledge, did not negate the great cognitive value of the study. He considered it a memorable, valuable achievement of Polish cartography.[28] Statistical data from the *Atlas* is sometimes referred to in the studies of Polish historians, especially from the area of northern Mazovia and the Kurpie region. They usually serve as a point of reference for quantitative analyses. Janusz Szczepański, for example, confronted the scale of emigration from the Kurpie region with church records, which showed much higher figures. Finally, they included illegal emigration, which is not included in government sources.[29] Janina Kuligowska cited data on smallholders,[30] Marian Chudzyński on manors and peasant estates,[31] Ryszard Wojciech Pawlicki on labor emigration to Prussia,[32] while Adam Białczak focused on the population of a specific area.[33] The *Atlas*'s monochrome choropleths are still used to communicate the local history of the smallest rural areas. On the pages of the website *Klub Zagłębiowski*, affiliated with Zagłębie Dąbrowskie, a series of maps from the collection of the Mikołaj Kopernik 1st High School in Będzin was published in December 2019. The most prominent among them were the Maciesza *Atlas* maps, illustrating selected demographic and social issues at the end of the 19th century. The scans of the cards were appropriately cropped to highlight information directly related to the Zagłębie area.[34]

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[28] Bogdan Horodyski, "Atlas Statystyczny Królestwa Polskiego Aleksandra Macieszy – epizod polskiej kartografii," in *Kartografia Królestwa Polskiego 1815–1915*, ed. Lucyna Szaniawska, and Jerzy Ostrowski (Biblioteka Narodowa, 2000), 144–50.

[29] Janusz Szczepański, "Emigracja zarobkowa z Kurpiowszczyzny (do I wojny światowej)," *Zeszyty Naukowe Ostrołęckiego Towarzystwa Naukowego* 7 (1993): 45.

[30] Janina Kulikowska, "Emigracja i duszpasterstwo wychodźców z Królestwa Polskiego do roku 1914," *Przeszłość* 65 (1986): 93.

[31] Marian Chudzyński, "Struktura własności ziemskiej w powiecie gostynińskim w latach 1864–1904," *Notatki Płockie. Kwartalnik Towarzystwa Naukowego Płockiego* 17, no. 5/69 (1972): 12–16.

[32] Ryszard Wojciech Pawlicki, "Sytuacja demograficzno-narodowościowa pogranicza mazursko-kurpiowskiego na przełomie XIX I XX wieku," *Zeszyty Naukowe Ostrołęckiego Towarzystwa Naukowego* 32 (2018): 58.

[33] Adam Białczak, "Z dziejów kurpiowskiego wychodźstwa zarobkowego do Ameryki Północnej w latach 1880–1918 na przykładzie gminy Baranowo," *Zeszyty Naukowe Ostrołęckiego Towarzystwa Naukowego* 27 (2013):18.

[34] "Rzut oka na mapę," *Klub Zagłębiowski* (blog), December 22, 2019, https://klubzaglebiowski.wordpress.com/2019/12/22/rzut-oka-na-mape.

The Choropleth Map as a Method of Presenting Spatial Data—New Analytical Possibilities of Interactive Digital Versions

One of the main criticisms of Maciesza's *Atlas* was its poor, sometimes even described as crude, graphic design and the resulting limited legibility of its tables. In Poland, the author decided to make innovative use of the highly suggestive but complex method of creating choropleths.[35] It is based on relating relative statistical values to area units, in this case to administrative division units, which were districts (powiaty). Statistical values are not given directly, as in charts or graphs. They are sorted into class intervals and groups of values are distinguished on the basis of them. Each group is assigned a certain color or hatching, and the territorial units are covered accordingly. The choropleth map works with units of area, so the statistical data given are related to them. They can be given in two forms, either in relation to area, such as population density in a given area, or as a value expressed as a percentage, such as the percentage of arable land in the total area. In both cases, these are relative values, generalized to the entire reference unit (field)—the district.[36] The choropleths methodologically created by Maciesza meet the above assumptions. In addition, in some of the tables, Maciesza placed a numerical value of the given feature on the background of the stencil in each reference field (district). The purpose of this was to increase the informative value of the whole table, as for each territorial unit it was possible to read not only its class interval (hatching), but also the specific unit value of the given parameter. However, there were minor errors in the data provided, most likely due to the engraver's mistakes, e.g., in Table XVI (on forest cover) in the Wieluń district of the Kalisz governorate, a number 2,000 smaller than in the original source was written: 45,455 instead of 47,455. However, the total for the entire governorate is correct. Similarly, in Table XIII (concerning arable land) for the Opoczno district of the Radom governorate a value of 91,129 is entered instead of 93,129, while in Table XV (on pastures) incorrect sub-summaries are given for the Piotrków governorate (70,035 instead of 71,035) and for the Plock governorate, 77,964 instead of 77,914. All these limitations resulting from the quality of the available editorial base meant that much of the potential value of the choropleth—as a method of presentation and spatial analysis of statistical data—was not properly represented in the *Atlas*. This inevitably reduced its attractiveness and limited the public's perception of it. This was all the more the case as continuous advances in printing technology led to lower costs and the spread of color printing.

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[35] Michał Palczyński, "Metodyka kartografii w warsztacie historyka," *Studia Zachodnie* 17 (2015): 306–309.

[36] For more on the subject, see Ratajski, "Polska," 53.

Against the backdrop of new, carefully edited cartographic productions[37] Maciesza's *Atlas* must have seemed anachronistic only a few years after its publication.

While the spread of color printing and improvements in its quality dramatically increased the readability of maps, it did not solve the problem of limitations on the amount of information that could be presented on them so that they could be effectively understood and remembered by the user. This has to do with the objective limits of human perception. These were identified in 1956 by American psychologist George Armitage Miller, who found that the number of different pieces of information that most people can directly perceive is plus or minus 7.[38] Thus, an excessive increase in the number of categories of information presented simultaneously on a map makes it less readable. The development of computer technology and its application to cartography has not, of course, eliminated this barrier, but it has introduced a revolutionary element in the use of digital maps—interactivity. Using computer tools, researchers can, for example, view data at different scales (progressive detailing) or in different thematic contexts. Interactive maps often allow filtering, sorting, or grouping of data. In practice, the user can manipulate the interface to define the display on the computer screen of a specific set of data needed for analysis, and to hide information not needed for that analysis at any given time. Thus, unlike previous analog maps, the researcher is not limited to an individual concept of presentation of statistical data proposed by the map creator/publisher, which cannot be changed after printing. The appropriately designed interactivity of the cartographic computer application allows the user to create a large number of original data projections. Their number is limited by the informational potential of the data set in the computer system and the possibilities of modifying the logical structure of the data through the interface.

This new feature has led to new possibilities of using maps in scientific research. In addition to the existing functions of presentation of geospatial information, it is possible to use an interactive map, provided with an appropriate interface, as an effective tool to support data analysis. Such analysis can generate completely new, previously unknown information. This functional aspect of cartography is studied from the theoretical side by a relatively new department—cartographic visualization.[39] It is now considered part of a much broader process, the essence

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[37] E.g., Eugeniusz Romer, ed., *Geograficzno-statystyczny atlas Polski* (Nakł. Polskich Spółek Oszczędności i Pożyczek, 1916), https://mbc.cyfrowemazowsze.pl/dlibra/show-content/publication/edition/16882?id=16882.

[38] George A. Miller, "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information," *Psychological Review* 63 (1956): 81–97, https://web.archive.org/web/20080728075223/http://www.musanim.com/miller1956.

[39] Anna Maria Leonowicz, *Kartogram jako forma prezentacji zależności zjawisk geograficznych* (PAN IGiPZ, 2006): 74–75; The emergence and evolution of the term *visualization* in cartography was outlined by Andrzej Czerny in "O pojęciu «wizualizacja»," in *Wizualizacja kartograficzna*

of which is cognitive exploration and exploratory spatial data analysis, with the goal of discovering regularities in such data sets. Through visualization and analysis using advanced statistical tools, it is possible, for example, to see the distribution, intensity, and spatial connectedness of the phenomena and processes under study, or to identify spatial trends and patterns. Of course, the *sine qua non* of any cartographic visualization is the availability of an adequate corpus of digital data linked to specific spatial locations.

Assumptions and Sources for the Electronic Version of the *Atlas*

Given the above-mentioned research potential of showing statistical data in the form of an interactive digital map, an electronic interactive version of Aleksander Maciesza's *Statistical Atlas of the Polish Kingdom* was produced in 2023. It was assumed that the computer publication would completely eliminate the difficulties in reading the data displayed, which resulted from the editorial "crudeness" of the original, and at the same time enrich it with information calculated *ad hoc* by the computer system, depending on the filters set by the user. It is available free of charge through any web browser on the Tableau Public platform: https://public.tableau.com/app/profile/krzysztof.narojczyk/viz/AtlasstatystycznodemograficznyKrlestwaPolskiego/START.

The electronic version of Maciesza's *Atlas* is by no means a faithful one-to-one digital copy of the original. It omits all those elements of the original whose informational value cannot be intensified or enhanced in any way by presentation in digital form. This includes the textual descriptions of individual tables and the additional statistical information they contain. Also omitted are the graphs added to some choropleths as visualizations of summary data. All of these elements in the original version present no problems of correct reading and interpretation. At the same time, they do not reveal data that could be processed with statistical computer tools or presented broken down by the primary reference points of the choropleths—the districts.

On the other hand, an analysis of the *Atlas*'s content leads to the conclusion that, probably in order to reduce the number of choropleths and thus the cost of publication, it omits several series of data that would have made it possible to analyze the structure of certain phenomena and broaden the perspective on selected issues, such as livestock breeding. Since this data is available in the primary sources on which the atlas is based, it was decided to digitize them and include them

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w nauce i praktyce (XXXIX Ogólnopolska Konferencja Kartograficzna. Streszczenia referatów i posterów, Lublin, 2016), 11.

in the source data corpus of the electronic version. In this way, the *Atlas* has been supplemented:

1. From the 15th issue of the Works of the Warsaw Statistical Committee:
– data on the total area of each district in tithes squared in 1894.[40] In the Committee's publication, data on the area is given from three sources: I. Strjelbicki's work *Superficie de l'Europe*,[41] Central Statistical Committee, 1897, and the Committee's own calculations for 1894. There are sometimes considerable differences between them. Since Maciesza used the Warsaw Committee's data, the electronic version of the *Atlas* also uses this version;
– data on the area of land used for buildings, orchards and gardens.[42]
2. From the 21st issue of the Works of the Warsaw Statistical Committee—land ownership data:[43]
– municipal lots;
– lots owned by others (not previously mentioned).
3. From the 18th issue of the Works of the Warsaw Statistical Committee—data on the number of farm animals:[44]
– pigs;
– sheep.

In addition, a range of additional information not directly available in the existing original data set was extracted from it, such as the population of nationalities other than those mentioned above and the number of adherents of religions other than those mentioned above. Thanks to these procedures and the expansion of the source base, it was possible, first of all, to create diagrams showing the national and religious structure of the population, as well as land use and land ownership for any given area. At the same time, the list of choropleths was enriched with the above-mentioned thematic subcategories, which completed the catalog of spatial patterns for the studied population patterns. However, the data presented in the *Atlas* cannot be approached uncritically. One should keep in mind the objections raised in the literature regarding the precision of some sources, mainly demographic.[45]

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[40] *Trudy Varšavskago Statističeskago Komiteta. Vyp. 15* (Warszawa, 1894), XV–XVII.

[41] I. Strjelbickij, *Superficie de l'Europe* (St. Petersburg, 1882).

[42] *Trudy Varšavskago Statističeskago Komiteta. Vyp. 15* (Warszawa, 1894), XVIII–XXI.

[43] *Trudy Varšavskago Statističeskago Komiteta. Vyp. 21* (Warszawa, 1905), 178–180.

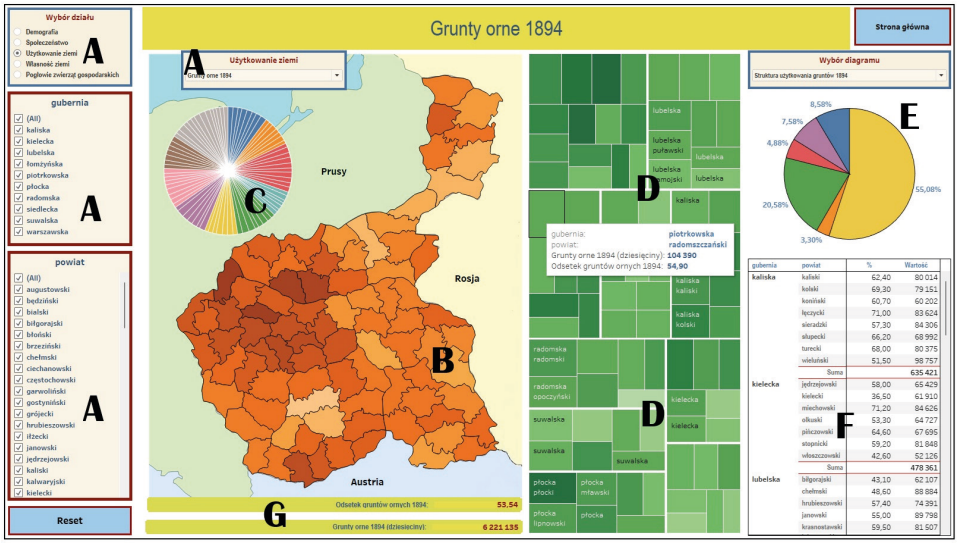
[44] *Trudy Varšavskago Statističeskago Komiteta. Vyp. 18* (Warszawa, 1901), 2–74.

[45] A comprehensive description of these demographic sources was given by Stefan Szulc, *Wartość materjałów statystycznych, dotyczących stanu ludności b. Królestwa Polskiego*, vol. 1, *Przyczynki do Statystyki Królestwa Polskiego* (GUS, 1920).

Functionality and Interactive Capabilities of the Electronic Version of the *Atlas*

As a result, the electronic atlas covers a total of 40 thematic issues grouped into five main sections: demography, society, land use, land tenure, and livestock.

Figure 2. Demo screen for the electronic version of the *Statistical Atlas of the Polish Kingdom*



The screen consists of:

– the selection area (A), i.e., a panel for two-step selection of the display topic (first the main section, then a specific topic) and two selection lists (governorates, districts) for filtering the territorial scope. The selections made in this panel apply to all forms of display on the screen except the pie chart (E), which shows the percentage structure of one of the four thematic categories. It uses territorial selectors, but the selection of a particular display is made from a list placed above the chart;

– the display area, which consists of a choropleth map (B), a pie chart for examining the weight (percentage share) of a particular area in the theme (C), a tree map-type diagram (D), a pie chart for presenting the structure of selected demographic characteristics (E), and a tabular summary of the data used in the current visualization, along with partial and overall summaries (when possible) (F). In addition, below the choropleth, the absolute and

relative values of the studied phenomenon calculated for the selected area (if possible) are placed (G), while the choropleth map legend precisely indicates its extreme values.

If the mouse is moved over any part of the visual display, an information box (balloon) appears with the name of the administrative unit associated with that part, together with the numerical parameters that characterize it (relevant to the thematic question being studied) (H). This option makes it possible to dispense with the legend of the pie chart and the tree map, since all the data is available by moving the mouse over the corresponding element in the visualization.

As in the original version of the *Atlas*, the basic tool for displaying statistical data and analyzing spatial patterns is a simple choropleth map (B). However, the use of computer technology to create presentation graphics has resulted in an important technological innovation. It makes it possible to develop continuous choropleth maps, i.e., without defining the class intervals of the data set. In practice, this means that a continuous scale of values for the subject under study corresponds to a continuous graphical scale. The result is an image with a greater depth of information, but one that is more difficult to interpret than a thematic map.[46] Although the human eye has the theoretical ability to distinguish about a million shades of color, this is not matched by the ability to quantify. Thus, the average viewer of a continuous thematic map sees the full depth of the subject, but may have difficulty assigning appropriate values to specific hues. This problem is completely solved by the option of displaying the information in the mouse-activated balloons, which in this case perform the function of an ad hoc precise legend for the choropleth maps. Each multi-level administrative division of the country is a clearly defined structure of a hierarchical nature—the enumerated units of a lower level are included in the specifically indicated units of a higher level. In the case of the Kingdom of Poland, certain districts are included in certain governorates, and these governorates make up the territory of the entire state. An effective tool for presenting the distribution of statistical values for such hierarchical structures is a tree-map. This concept was first introduced in 1991 by Ben Shneiderman and Brian Johnson at the Proceedings Visualization ’91 conference in San Diego.[47] A tree-map is a chart used to display large amounts of data that are organized or categorized hierarchically in a way that would require a relatively large display area using other methods. The name of the method refers to the definition of “tree” in computer science, which represents a hierarchical set of data.

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[46] Waldemar Spallek, “Metody prezentacji gęstości zjawisk rozproszonych na mapach tematycznych,” *Polski Przegląd Kartograficzny* 34, no. 1 (2002): 15.

[47] Brian Johnson and Ben Shneiderman, “Tree-Maps: A Space-Filling Approach to the Visualization of Hierarchical Information Structures,” in *Proceeding Visualization ’91* (IEEE, 1991), 284–91, https://doi.org/10.1109/VISUAL.1991.175815.

In the electronic *Atlas*, the tree-map (D) is formed by a rectangle representing the area specified in the selection panel, e.g., the entire Kingdom of Poland. It is subdivided into smaller rectangles, separated by wide white lines, corresponding to administrative units, the governorates. These, in turn, are divided into rectangles—separated by narrower white lines—representing the smaller territorial units that make them up, the districts. The size (area) of each rectangle is proportional to the value of a variable, such as the population found in a given area. The hierarchy of the data displayed is reflected by the position of the rectangles in the graph. The upper left corner always contains the unit with the largest value, while the lower right corner contains the smallest value within a given structure. In between, intermediate units are placed sequentially according to the above order. Where possible, the intensity of the color indicates the value of the second variable, such as population density (as in choropleth maps). In this way, the tree map shows for each territorial unit:

- the scale of occurrence (absolute value), through the size of the rectangles
- the hierarchy of participation in the larger unit, through the location within the diagram;
- the intensity of the occurrence (relative value), through variation in color intensity.

The simultaneous juxtaposition of these elements makes it easy to find the units that contribute most and least to the subject under study. The concentration of a large number of units in a small display area made it impossible to include a legend. Therefore, the names of the individual territorial units and the values of the variables for each of them are displayed after pointing to them with the mouse.

A function similar to that of a tree map is provided by a pie chart (C) located within the choropleth maps. It shows the percentage share of the selected district in the whole subject in the selected area. This makes it easy to determine the potential of any district in relation to the selected area. Pointing to two or more units (governorates or districts) in the selector (A) allows them to be compared with each other.

At the top of the right side of the screen is a standard pie chart (E) showing the percentage structure for the four data categories. Below this is a table (F) showing the data extracted from the entire database by selecting a topic category and a display range in the selector (A).

After opening the program on the Tableau Public platform, there are system icons at the bottom of the screen that enable, among other things, the screen to be maximized and saved in several basic formats.

The electronic version of Alexander Maciesza's *Atlas*, enriched with additional data series, addresses most of the editorial objections raised against the original work. Colorful choropleth maps allow a dynamic presentation of spatial patterns for many thematic issues of demography and socio-economic relations in the Kingdom

of Poland at the turn of the 20th century. The user interface is equipped with analytical tools for studying quantitative relations and distribution of statistical values for hierarchical structures—units of administrative division. In addition, the application's interactivity allows users to generate responsive data projections for specific territorial units. This can provide the impetus for comparative and regional historical research.

It also appears that the interactive atlas formula outlined above can be applied to other source materials containing spatially localized statistical and demographic data. The prerequisite, of course, is their prior digitization, such as the Table of Towns, Villages, Settlements... of 1827.[48]

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[48] See Krzysztof Narojczyk, "Tabella Miast, Wsi, Osad Królestwa Polskiego z wyrażeniem ich położenia i ludności alfabetycznie ułożona w Biórze Kommissyi Rządowey Spraw Wewnętrznych i Policyi z 1827 r. Znane źródło w nowej postaci," *Przeszłość Demograficzna Polski – Poland's Demographic Past* 43 (2021): 29–59, https://doi.org/10.18276/pdp.2021.43-02.

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Electronic Version of Aleksander Maciesza's 1907 *Statistical Atlas of the Polish Kingdom*

Summary

The history of choropleth maps as a method of displaying statistical data cartographically is almost 200 years old. In Poland, for a long time, such information was attached to administrative or general geographic maps in the form of tables or verbal descriptions. However, they were not visualized in the form of a thematic layer. A forerunner in this field was Aleksander Maciesza, a doctor and social and political activist from Płock. Driven by patriotic motives, he compiled and published the *Statistical Atlas of the Polish Kingdom* at his own expense in Płock in 1907. This work contains 32 thematic tables on various

demographic and socio-economic issues in the Kingdom at the turn of the 20th century. The basic means of displaying these issues are simple monochromatic choropleth maps, in which the data class intervals are differentiated by shading (hatching). The statistical data was taken from printed sources available at the time, mostly of an official nature. The lack of access to advanced publishing technology meant that the choropleth maps, while methodologically correct, lacked an attractive, eye-catching, and easy-to-understand graphical form. Although generally well received by commentators, the Atlas failed to gain wider recognition and lost out to newer, editorially superior cartographic productions. In 2023, an electronic version of the Atlas was produced and made available on the Tableau Public platform https://public.tableau.com/app/profile/krzysztof.narojczyk/viz/AtlasstatystyczneDemograficznyKrlestwaPolskiego/START. The source base of this new edition has been enriched with several data series to build percentage structures for selected thematic issues. The display level is mainly based on colored choropleth maps that clearly illustrate spatial patterns. In addition, a tree-map was used to display nested hierarchical data. An interactive interface allows data to be selected by territory. This allows the user to explore quantitative relationships and the distribution of statistical values for administrative units, and to generate data projections for specific territorial areas. This can facilitate both inter-regional comparative studies and those related to local history.

Elektroniczna wersja *Atlasu statystycznego Królestwa Polskiego* Aleksandra Macieszy z 1907 roku

Streszczenie

Historia kartogramu jako metody odwzorowywania kartograficznego danych statystycznych ma już nieomal 200 lat. W Polsce przez dłuższy okres informacje o takim charakterze dołączano w postaci tabel lub opisu słownego do map administracyjnych lub ogólnogeograficznych. Nie były one jednak wizualizowane w postaci warstwy tematycznej. Prekursorem na tym polu jest płocki lekarz, działacz społeczny i polityczny, Aleksander Maciesza. Z pobudek patriotycznych opracował on i własnym sumptem wydał w 1907 roku w Płocku *Atlas statystyczny Królestwa Polskiego*. Dzieło to zawiera 32 tablice tematyczne odnoszące się do różnych zagadnień demograficznych i społeczno-ekonomicznych Królestwa na przełomie XIX i XX w. Podstawową formą prezentacji owych zagadnień są jednobarwne kartogramy proste, w których przedziały klasowe danych zróżnicowano szrafowaniem (kreskowaniem). Dane statystyczne zostały zaczerpnięte z dostępnych ówcześnie źródeł drukowanych, głównie o charakterze urzędowym. Brak dostępu do zaawansowanej technologii wydawniczej sprawił, że kartogramy, aczkolwiek poprawnie wykonane pod względem metodologicznym, nie miały atrakcyjnej, przyciągającej uwagę i ułatwiającej percepcję formy graficznej. Atlas pomimo ogólnie dobrego przyjęcia przez komentatorów nie znalazł szerszego uznania i przegrał rywalizację z nowszymi, doskonalszymi

edytorsko produkcjami kartograficznymi. W roku 2023 opracowano i udostępniono na platformie Tableau Public https://public.tableau.com/app/profile/krzysztof.narojczyk/viz/AtlasstatystyczneDemograficznyKrlestwaPolskiego/START jego elektroniczną wersję. Baza źródłowa tej nowej edycji została wzbogacona o kilka serii danych, które pozwoliły zbudować struktury procentowe wybranych zagadnień tematycznych. Warstwa prezentacyjna oparta jest głównie na barwnym kartogramie ciągłym, ilustrującym czytelnie wzorce przestrzenne. Oprócz tego zaimplementowano wykres typu mapa drzewa, który umożliwia prezentowanie zagnieżdżonych danych hierarchicznych. Interaktywny interfejs pozwala selekcjonować dane pod względem terytorialnym. Użytkownik może dzięki temu badać relacje ilościowe i rozkład wartości statystycznych dla jednostek administracyjnych oraz generować projekcje danych dla określonych obszarów terytorialnych. Może to ułatwiać zarówno międzyregionalne badania porównawcze, jak i te związane z historią lokalną.

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Application of the Social Network Analysis Method to the Reconstruction of a Social and Kinship Network Based on the Marriage Registers of the 18th Century Parish of Żarki

Zastosowanie metody analizy sieci społecznościowej do rekonstrukcji sieci społeczno-towarzyskiej na przykładzie ksiąg zaślubin XVIII-wiecznej parafii żareckiej

Abstract

The purpose of this article is to describe a practical application of the Social Network Analysis (SNA) method in demographic and historical research. It was used to reconstruct the social and kinship network of the 18th-century parish of Żarki on the basis of marriage registers. The SNA method is still rarely used by Polish historians. The article uses mathematical graph models, created on the basis of scenarios, to better analyze the role of two basic concepts (nodes and kinship) in the social network, resulting in the specification of the central role of kinship in the network. The relationships described in the article are those of marriage, testimony and kinship.

Abstrakt

Celem niniejszego artykułu jest przedstawienie praktycznego zastosowania metody analizy sieci społecznościowej (SNA) w badaniach demograficzno-historycznych. Metodę tę wykorzystano do rekonstrukcji sieci społeczno-towarzyskiej XVIII-wiecznej parafii żareckiej na bazie ksiąg zaślubionych. Metoda SNA wśród polskich historyków jest jeszcze rzadko stosowana. W artykule posłużono się modelami grafów, stworzonymi na podstawie scenariuszy, dla lepszego przeanalizowania roli dwóch podstawowych pojęć (węzła i relacji) w sieci społecznej, czego wynikiem jest wyszczególnienie centralnej roli relacji w sieci. Opisano relacje: małżeństwa, świadkowania

The Gephi network visualization program was used to generate a digraph of the parish of Żarki (1718–1720), as an example of a small town community.

i powinowactwa. Program Gephie, używany do wizualizacji sieci, został wykorzystany do wygenerowania sieci skierowanej parafii żareckiej (1718–1720) jako przykład małomiasteczkowej społeczności.

Keywords

Żarki parish, 18th century, SNA, social network analysis, social structure, social network, nodes, relationships, directed node, undirected node, reciprocal node, marital relationship, witness relationship, kinship/affinity relationship

Słowa kluczowe

parafia żarecka, XVIII wiek, SNA, analiza sieci społecznościowych, struktura społeczna, sieć społeczno-towarzyska, węzły, relacje, połączenie skierowane, połączenie nieskierowane, połączenie obustronne, relacja małżeńska, relacja świadkowania, relacja powinowactwo/pokrewieństwo

Introduction

"Through error you come to the truth!" (Fyodor Dostoyevsky)

Social networks as a real-world phenomenon have existed and continue to exist, regardless of the research being done on them. Niall Ferguson writes, "We live ... in the network age,"[1] emphasizing that there is a growing awareness of this phenomenon in the modern world. However, in order to understand the mechanisms of today's networks, it is necessary to study those that existed in the past, even the smallest ones.[2]

Trying to reconstruct the social network of the 18th century, especially that of a small town with an urban and rural character, is a great challenge for the historian. This is due to the difficulty of obtaining various types of source material (documents, diaries, accounts, ecclesiastical and secular population registers, tax censuses, etc.), on the basis of which it is possible to reconstruct the structures of human relationships. Sometimes the researcher is left only with parish registers, which are classified as demographic sources. This type of source makes

[1] Niall Ferguson, *Rynek i ratusz. O ukrytej sieci powiązań, która rządzi światem* (The Square and the Tower: Networks and Power, from the Freemasons to Facebook) trans. Wojciech Tyszka, 2nd ed. (Wydawnictwo Literackie, 2024), 37.

[2] Ferguson, *Rynek*, 38.

it possible, to a certain extent,[3] to reconstruct an objective reality fixed in time and space. The text of the article is an attempt to demonstrate a practical application of the method of Social Network Analysis (SNA) to the reconstruction of the social and kinship network of small-town society in the 18th century, on the basis of marriage registers.

The Social Network Analysis method has its roots in sociology, where it is used to analyze contemporary communities. Based on questionnaires and surveys with appropriately formulated questions, social networks are reconstructed. However, it is emphasized that this is only a fragment of a particular world and that interpersonal interactions are more complex and multi-layered. A historian consulting 18th century parish registers is aware that they were not written with the idea that they would one day be used to reconstruct social networks using the SNA method. Nevertheless, the undoubted advantage of this method is its ability to structure and analyze large amounts of data and to capture possible processes that are difficult to detect with traditional methods. One of the methods used in Social Network Analysis is the mathematical graph. The advantage of the graph is its flexibility and ease of adaptation to different fields of study.[4] However, the SNA's mathematical approach to graph formation can cause difficulties.

The subject of the study is the 18th-century population of the Żarki parish, which until 1795 was administratively part of the Kraków Voivodeship and the Lelów District, and was owned by the Męcinski family of Kurozwęki under the Poraj Coat of Arms.[5] The social and kinship network of this parish will be reconstructed on the basis of the marriage records.[6] In pre-statistical demography marriage registers are considered the most reliable of the three series (marriages, baptisms and deaths).[7] The Żarki parish registers from this period have been inventoried and are kept in the Diocesan Archives in Częstochowa.[8] The research aims at capturing two genera-

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[3] Irena Gieysztorowa, *Wstęp do demografii staropolskiej* (PWN, 1976); Irena Gieysztorowa, "Niebezpieczeństwa metodyczne polskich badań metrykalnych XVII–XVIII wieku," *Kwartalnik Historii Kultury Materialnej* 19, no. 4 (1971): 557–603.

[4] Various academic disciplines use the graph as an auxiliary element to better represent the relationships under study.

[5] The parish of Żarki is located in the Kraków-Częstochowa Jura in the Silesian voivodeship. The oldest monograph was written by Stanisław Ufniarski, *Dzieje Parafii Żareckiej* (n.d.), Jasna Góra, with the latest by Jacek Szpak, *Dzieje Żarek – Leśniowa – Przewodziszowic: do 1870 roku* (Wydawnictwo Cum Laude, 2023).

[6] The oldest parish registers are the *Liber Baptizatorum* of 1696, the *Liber Mortuorum* of 1718 and the *Liber Copulatorum* of 1718. They are kept in the Archdiocesan Archive in Częstochowa. The *Family Search* database is used for research. All three series of books are relatively complete. It was discovered that the *Liber Mortuorum* 1718–1757 series has no records for the year 1723.

[7] Gieysztorowa, "Niebezpieczeństwa metodyczne," 588; Gieysztorowa, *Wstęp*, 251–252.

[8] Jan Związek, "Inwentarz łacińskich ksiąg metrykalnych Archiwum Diecezjalnego w Częstochowie," *Archiwa, Biblioteki i Muzea Kościelne* 37 (1978): 175–220.

tions in the period from 1718 to 1795 in the form of a directed network. The network reconstructed in this way will be subjected to a variety of research analyses available with the SNA method: statistical methods (calculation of arithmetic means, weights or correlations), and analysis in terms of the whole network—its density, cohesion, centralization, group formation or clique. In addition, the following are analyzed in terms of the "ego-network" unit: prestige, position in the group, or placement in relation to the network as a whole; analysis of social life, including in relation to demographic characteristics: the age of the newlyweds, their age at first marriage, and age at second marriage,[9] the mobility of the newlyweds, the choice of partners and witnesses, or the social structures from which partners or witnesses were chosen. In addition, a network reconstructed in this way can reveal the nuances of relationships between the population, as well as the interactions between different social groups such as the petty gentry, town owners, millers, or the urban poor. In addition to its advantages, social network analysis also has disadvantages. First, it should be remembered that the reconstructed network is only a subjective fragment of a past reality, based on induction and deduction. In order to visualize such a construct, appropriate software is required. In this research the program Gephi 0.10 is used.[10]

The purpose of this article is to describe a practical approach to the use of the SNA method in the reconstruction of a directed social network. After a brief introduction, issues of the conjugal relationship in both ecumenical law and secular tradition are discussed. After an introduction to the main concepts of the SNA method (social network, node, directed relationship, undirected relationship), the concept of its application in network reconstruction is outlined. The concept is presented in a step-by-step manner using model examples to illustrate the key role of relationships in networks. The article concludes with an example of the social network of the parish of Żarki for the years 1718–1720. The motivation for writing the article is the desire to popularize the SNA method for demographic and historical research.

Origins of the Social Network Analysis Method

The list of contributors, authors, and researchers in Social Network Analysis (SNA) is long. The examples given are subjective in nature and also reflect the concept of the article. Georg Simmel published a paper in 1908 entitled

[9] This age is calculated based on the baptismal records.

[10] In addition, the following can be used: UCINET, R, SIENA, Pnet, Pajek or NodeXL. This article focuses on the theoretical possibility of developing a social structure without discussing Gephi software in detail.

"Die quantitative Besimmtheit der Gruppe." In it he outlined his research on the variable interactions between the individual and social circles/groups. He states that a dyad is the smallest element (two individuals and the connection between them) of such a community, where there are already variable relationships (like them or dislike them; know them or don't know them; son–father or father–son, etc.). If, on the other hand, we extend its structure to include another individual, a triad is formed. A third individual who joins the group can either alleviate or aggravate conflicts, thereby triggering new behavioral mechanisms. Historically, Simmel is considered one of the pioneers and founders of Social Network Analysis.[11]

Jacob Moreno contributed to the development of SNA by being the first to introduce graphical charts, which he called sociograms, and the method by which he measured social relationships, sociometry (*Who Shall Survive*?, 1934).[12] The term 'social structure' in the context of networks was first used by the sociologist and anthropologist Alfred Radcliffe-Brown in 1940.[13] John A. Barnes, after a fourteen-month study of the community in Bremnes, formulated the concept of a network in his work *Classes and Committees in a Norwegian Island Community* (1954). He imagined it as a collection of nodes connected by lines, where the nodes could represent individuals or groups, while the lines outlined the interaction between them.[14]

The 1960s and 1970s saw the development of graph theory[15] and computer science. These disciplines were instrumental in the development of the methods of social network analysis. At the end of the 20th century, SNA was not widely used by researchers in other sciences outside of sociology and related disciplines. In contrast, the 21st century is already being referred to as the age of networks to emphasize that everything around us is interconnected. Increasing computerization and the technology to support it have made it possible to analyze more and more data, which has positively influenced the growing interest in the SNA method for various research projects.[16]

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[11] Boris Holzer and Christian Stegbauer, eds, *Schlüsselwerke der Netzwerkforschung* (Springer VS, 2019), 507–14; Jan Ahrendt Fuhse, *Soziale Netzwerke. Konzepte und Forschungsmethoden* (UVK Verlag, 2016), 30–33; Dorothea Jansen, *Einführung in die Netzwerkanalyse: Grundlagen, Methoden, Forschungsbeispiele* (Verlag für Sozialwissenschaften, 2006), 37.

[12] Holzer and Stegbauer, *Schlüsselwerke*, 425–28; Fuhse, *Soziale Netzwerke*, 35–36, Jansen, *Einführung*, 40.

[13] Fuhse, *Soziale Netzwerke*, 48; Holzer and Stegbauer, *Schlüsselwerke*, 481–84; Jansen, *Einführung*, 43.

[14] Holzer and Stegbauer, *Schlüsselwerke*, 31–34; Fuhse, *Soziale Netzwerke*, 50.

[15] Jansen, *Einführung*, 40.

[16] Alexis Pister et al., "From Historical Documents To Social Network Visualization: Potential Pitfalls and Network Modeling," in *VIS4DH 2022: 7th Workshop on Visualization for the Digital Humanities* (Oklahoma, 2022), https://inria.hal.science/hal-03784532; Charles Wetherell, "Historical Social Network Analysis," *International Review of Social History* 43, no. S6 (1998): 125–44,

Use of the SNA Method: State of Research

In 2020, Cezary Kuklo noted "the need for new research methods in the historian's toolbox, such as Social Network Analysis (SNA)."[17] Jerzy Marek Minakowski is credited with the greatest achievement in using the tools of the SNA method.[18] Dorota Gregorowicz, reviewing Michał Salamonik's book *Mieszczańska kariera w szlacheckiej Rzeczypospolitej? Francesco De Gratta i jego social network* (A Bourgeois Career in the Noble Republic? Francesco De Gratta and His Social Network) commented on the "ego-network" method chosen by the author to better characterize the main character.[19] The network context using the SNA method to present the main research areas of Professor Edward Wlodarczyk was used in the article "Działalność naukowa profesora Edwarda Włodarczyka w świetle publikacji autorskich (1973–2020) ("The Academic Work of Professor Edward Wlodarczyk in the Light of his Publications (1973–2020)")."[20] Dariusz Chojecki

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https://doi.org/10.1017/S0020859000115123; Emily Buchnea and Ziad Elsahn, "Historical Social Network Analysis: Advancing New Directions," *International Business Review* 31, no. 5 (2022): 101990, https://doi.org/10.1016/j.ibusrev.2022.101990; Barbara Dörpinghaus and Hans-Georg Wünch, "Relationships and Forms in the Social Network of the Jacob Narrative: A Narratological Perspective," *Old Testament Essays* 36, no. 2 (2023): 347–67, https://doi.org/10.17159/23123621/2023/v36n2a4; Roman Deiksler, "Social Network Analysis in the Study of the Works of Josephus. The Case Study of Galilee during the First Jewish Revolt," *Folia Praehistorica Posnaniensia* 24 (2019): 35–46, https://doi.org/10.14746/fpp.2019.24.02; Maria Korybut-Marciniak, "Potencjał analizy sieci społecznych w badaniach egodokumentów," *Rocznik Antropologii Historii* 13 (2020): 257–73, https://doi.org/10.25945/RAH.2020.13.011; Wojciech Stachyra, "Użyteczność badawcza struktur sieciowych w nauce o stosunkach międzynarodowych," *Athenaeum Polskie Studia Politologiczne* 70, no. 2 (2021): 159–74, https://doi.org/10.15804/athena.2021.70.10; Evina Stein and Gustavo Fernández Riva, *Networks of Manuscripts, Networks of Texts*, special issue of *Journal of Historical Network Research* 9, no. 1 (2023), https://doi.org/10.25517/JHNR.V9I.

[17] Cezary Kuklo, "Badania nad historią kobiet w Polsce XVI–XVIII wieku w latach 2011–2020. Niezmienna atrakcyjność, ale czy nowe pytania?," *Acta Universitatis Lodziensis. Folia Historica* 107 (2020): 14, https://doi.org/10.18778/0208-6050.107.02.

[18] Marek Jerzy Minakowski, "Social Networks Around *Kurier Warszawski* Based on its Obituaries of the Years 1821–1861," *Przeszłość Demograficzna Polski – Poland's Demographic Past* 39 (2017): 209–51, https://doi.org/10.18276/pdp.2017.39-09; Marek Jerzy Minakowski, "House of Networks: The Polish-Lithuanian Senate (1569–1795) as Parliamentary Representation of the National Social Network (of Women?)," *Przeszłość Demograficzna Polski – Poland's Demographic Past* 41 (2019): 33–56, https://doi.org/10.18276/pdp.2019.41-02; Marek Jerzy Minakowski, "Family Network of Emerging Jewish Intelligentsia (Cracow 1850–1918)," *Journal of Historical Network Research* 2 (2018): 53–75.

[19] Dorota Gregorowicz, "Mieszczańska kariera w szlacheckiej Rzeczypospolitej? Francesco De Gratta i jego social network," *Zapiski Historyczne* 87, no. 2 (2022): 133–49, https://doi.org/10.15762/ZH.2022.17.

[20] Dariusz K. Chojecki, "Działalność naukowa profesora Edwarda Włodarczyka w świetle publikacji autorskich (1973–2020). Kontekst ilościowy," *Zapiski Historyczne* 87, no. 1 (2022): 107–32, https://doi.org/10.15762/ZH.2022.05.

and Radoslaw Gaziński created a social and family network of Huguenots living in Szczecin at the end of the 18th century using baptismal registers. The network they constructed is of an undirected nature.[21]

However, the use of marriage registers for social network analysis is rarely used in demographic research. Aleksandra Dul in her article "Życie towarzyskie dziewiętnastowiecznej wiejskiej parafii. Analiza sieci społecznych" (Social Life of a Nineteenth-Century Rural Parish: An Analysis of Social Networks)[22] created a picture of the social network of a 19th century community, on the basis of which she attempted to describe the residents of the Ivanovice parish. The network she built took the form of a directed graph, thanks to which all the relationships retained their information in the connections.

The Main Concepts of Social Network Analysis

Graph theory adapted for Social Network Analysis influenced the development of its terminology. These new disciplines developed primarily in English-speaking culture.[23] Below are some basic definitions.

> Graph:
> *A graph G consists of a non-empty finite set V(G) of elements called vertices, and a finite family E(G) of unordered pairs of (not necessarily distinct) elements of V(G) called edges; the use of the word "family" permits the existence of multiple edges. We call V(G) the vertex set and E(G) the edge family of G.*"[24]
>
> Network:
> *A network is, in its simplest form, a collection of points joined together in pairs by lines. In the nomenclature of the field a point is referred to as a node or vertex and a line is referred to as an edge.*[25]

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[21] Dariusz K. Chojecki and Radosław Gaziński, "Le réseau de sociabilité des huguenots dans le Szczecin prussien au début du XVIII siècle à la lumière des données sur les baptêmes," *Annales de Démographie Historique* 147, no. 2 (2024) [forthcoming].

[22] Aleksandra Dul, "Życie towarzyskie dziewiętnastowiecznej wiejskiej parafii. Analiza sieci społecznych," *Przeszłość Demograficzna Polski – Poland's Demographic Past* 39 (2017): 167–208, https://doi.org/10.18276/pdp.2017.39-08.

[23] Well-known research centers where numerous scientists have worked include the Massachusetts Institute of Technology (MIT), and the Universities of Michigan, Harvard and Cambridge.

[24] Robin J. Wilson, *Introduction to Graph Theory*, 4th ed. (Prentice Hall, 2009), 9.

[25] Mark E. J. Newman, *Networks*, 2nd ed. (Oxford University Press, 2018), 1.

Social network:
A social network is a structure composed of a set of entities, some of whose members are connected by a set of one or more relations.[26]
A social network consists of a set of nodes (sometimes referred to as actors or vertices in graph theory) connected via some type of relations, which are also called ties, links, arcs, or edges.[27]

The purpose of the above summary is to show the similarities and differences between the concepts cited.

All three definitions speak of two sets, where for graphs they are abstract elements, for networks they are sets of points and lines, and for social networks they are sets of nodes (which can be called actors) and relationships (familiarity relationships, hierarchy relationships, contact relationships, etc.). This mathematical world has been applied to social research. In social network analysis, a social network, or graph as a network structure, is defined as a set of nodes connected by various types of relationships.

Since graph theory is, so to speak, the basis of the above definitions, the following are its key concepts, which are also used in SNA.

The mathematical form of graph notation is as follows:

$$G[raph] = (V[ertices], E[dge])^{28} \quad (1)$$

This states that a graph consists of two sets: vertices and edges, whereby the set of vertices is a non-empty set, while the set of edges can be an empty set. In addition, one element from the edge set connects a minimum of two elements from the vertex set.[29]

Depending on the direction of the edges, the graphs are either directed or undirected.[30] A directed graph defines a directed edge (arrow, arc) that connects an ordered pair of vertices, where one will be called the source (outgoing) vertex and the other the target (incoming) vertex. An undirected graph is characterized

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[26] David Knoke and Song Yang, *Social Network Analysis* (Sage Publications, 2020), 12.

[27] Song Yang et al., *Social Network Analysis: Methods and Examples* (Sage Publications, 2017), 5.

[28] For more on this subject, see the Appendix.

[29] John Clark and Derek Allan Holton, *Graphentheorie: Grundlagen und Anwendungen* (Spektrum, 1994); Peter Tittmann, *Graphentheorie: eine anwendungsorientierte Einführung* (Hanser Verlag, 2011); and, e.g., Wilson, *Introduction*.

[30] Jacek M. Wojciechowski and Krzysztof Pieńkosz, *Grafy i sieci* (Wydawnictwo Naukowe PWN, 2013), 1. They use the terms "unoriented graph" for undirected graph and "oriented graph" for directed graph.

by an undirected edge (line) that connects an ordered pair of vertices, where each vertex can be a source vertex as well as a target vertex.[31]

This mathematical world has been applied to social research. In social network analysis, a social network, or graph as a network structure, is defined as a set of nodes connected by different types of relationships.[32] Nodes can represent individuals, groups, institutions, organizations, or any other research object, depending on the research question. The most commonly used term for a node in social network analysis is "actor"[33] and for an edge, "relationship."[34] This world of networks is very diverse, and it itself can divide into yet other smaller network components, which will be analyzed further. There is no single network.

One more aspect of Social Network Analysis terminology needs to be emphasized i.e., based on graph theory, which is not standard, so each mathematician uses their own definitions,[35] which affects the use of terminology in Social Network Analysis literature.

In the rest of the article, the following notation will be used for the main concepts described. Social Network Analysis:

– for defining undirected links/relationships

$$E = \{\{a,b\},\{c,d\}\}$$

where the letter **E** stands for *edge*. Elements of an undirected relationship will be written in curly brackets **{a,b}**,**{c,d}** which is also intended to mean that there is neither a start nor an end node. Information flows from **a** to **b** and vice versa from **b** to **a**;

– for defining links/directed relationships

$$A = \{(a,b), (b,a)\}$$

where **A** stands for *arc*. Elements of directed links will be written in round brackets **(a,b)** which means that **a** connects to **b**. In addition, it is clear that **a** is the start node and **b** is the end node;

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[31] Information on directed and undirected graphs has been included in tabular form—see the Appendix.

[32] Yang et al., *Social Network*, 12; Knoke and Yang, *Social Network*, 5.

[33] The use of the word "actor" in a social network often leads to misunderstandings especially when studying the relationship between companies, businesses, partnerships or organizations, for in this case the actor is not necessarily a person. See Newman, *Networks*, 106.

[34] Anyone interested should read the article by Radosław Sierocki, "Analiza sieci społecznych jako metoda badawcza w socjologii," *Rocznik Antropologii Historii* 13, (2020): 223–55, https://doi.org/10.25945/RAH2020.13.009.

[35] "The language of graph theory is not standard—all authors have their own terminology (…). Any such definition is perfectly valid, provided that it is used consistently." Wilson, *Introduction*, 9.

– for defining nodes/actors

$$V = \{a,b,c,d\}$$

where **V** stands for *vertex*. The elements of the set will be written in curly brackets.[36]

The Marriage Certificate in Canon Law Versus Secular Tradition

The legal form of marriage was established by the 24th session of the Council of Trent on November 11, 1563, and supplemented by Pope Paul V in the *Rituale Romanum* of 1614.[37] The ecclesiastical ordinances were intended to put an end to so-called secret marriages, while at the same time bringing the act of marriage under ecclesiastical jurisdiction. According to canon law, a marriage was valid if the couple expressed their free, uncoerced will to marry before "the legitimate parish priest and two or three witnesses."[38] A legitimate parish priest was the priest of the parish from which the engaged couple originated. In the case of two different parishes, the priest from the bride's parish was to perform the wedding. If the bride and groom had no fixed abode, the priest of the parish where they currently resided would be the legitimate priest. In addition, canon law defined the role of the priest as an official witness, but emphasized his conscious participation in the ceremony—"of sound mind and with full awareness." For the marriage to be valid, in addition to the attendance of the priest, at least two witnesses were required to be present.[39] The witnesses were to be "in possession of their senses and of sound mind."[40] Formally, minors, outlaws, relatives, parents, women, or heretics could

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[36] For further information, see the Appendix. I also refer you to the work by André and Helge Röpcke, *Graphen und Netzwerktheorie: Grundlagen, Methoden, Anwendungen* (Hanser Verlag, 2024), 128.

[37] Władysław Abraham, *Forma zawarcia zaręczyn i małżeństwa w najnowszem ustawodawstwie kościelnem* (Lwów, 1913): 25–27, Abraham, *Forma*, 27: "The decrees of Trent formed the basis of Catholic ecclesiastical law in force from that time on; subsequent legislation up to recent times have merely clarified or supplemented the Council's provisions (...);" Cezary Kuklo, *Demografia Rzeczypospolitej przedrozbiorowej* (DiG, 2009), 272; Radosław Kotecki, "Rejestracja metrykalna wiernych w świetle potrydenckiego ustawodawstwa Kościoła katolickiego," *Nasza Przeszłość* 112 (2009): 7; Bolesław Kumor, "Metryki parafialne w archiwach diecezjalnych," *Kwartalnik Historii Kultury Materialnej* 14, no. 1 (1966): 65–66; Marion Lischka, "Liebe als Ritual: Eheanbahnung und Brautwerbung in der frühneuzeitlichen Grafschaft Lippe," *Forschungen zur Regionalgeschichte*, Band 55 (F. Schöningh, 2006), 51.

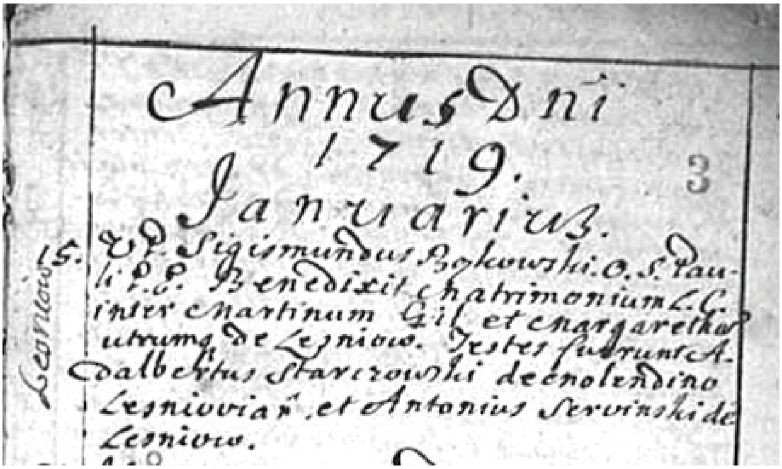
[38] Juliusz Bardach, Bogusław Leśnodorski and Michał Pietrzak, *Historia państwa i prawa polskiego* (PWN, 1987), 229; A similar formulation can be found in Władysław Abraham, *Forma*, 30.

[39] Abraham, *Forma*, 32.

[40] Józef Pelczar, *Prawo małżeńskie katolickie u uwzględnieniem prawa cywilnego obowiązującego w Austryi, w Prusach i w Królestwie Polskiem*, 2nd ed. (Drukarnia Uniwersytetu Jagiellońskiego,

fulfill this role; they were not even required to know the couple.[41] In addition, canon law regulated the form of banns and possible impediments to the couple.[42] The Tametsi decree of the Council of Trent not only normalized the law of marriage, but also obliged every parish priest to immediately record the event in the Marriage Register (Libri copulatorum) and to keep it.[43] Quoting Bolesław Kumor, the form of the entry in the book read: "Year (...), month (...), day (...), I N., parish priest (or vicar) of the parish church of N., confirmed (confirmavi) the marriage contracted between N. and N. in the said parish church in the presence of N. and N. and many others present, after the usual announcements had been made."[44] The marriage registers of the 18th century Żarki parish meet the basic requirements of the entries, except perhaps that "benedixit/benedixi" and "ratificavit/ratificavi" were written instead of "confirmavi."

Figure 1. From the 1719 marriage register of Żarki parish



Source: https://www.familysearch.org, accessed August 24, 2024.

1885), 316.

[41] Pelczar, *Prawo*, 316; Anna Tunia, "Kształtowanie się kanonicznej formy zawarcia małżeństwa," *Roczniki Nauk Prawnych* 18, no. 1 (2008): 135; Abraham, *Forma*, 32.

[42] Abraham, *Forma*, 27–29; Pelczar, *Prawo*, 329–37.

[43] Józef Kurpas, "Początki ksiąg metrykalnych," *Archiwa, Biblioteki i Muzea Kościelne* 2, nos. 1–2 (1961): 22; Bartosz Małłek, "Księgi metrykalne parafii rzymskokatolickiej w Sypniewie k. Więcborka z lat 1730–1874: stan zachowania i możliwość odtworzenia ruchu naturalnego ludności," *Zasoby Biblioteki Głównej UMCS* (2018): 264, http://dlibra.umcs.lublin.pl/dlibra/publication/39414/edition/36157; Kuklo, *Demografia*, 92; Kumor, *Metryki*, 67.

[44] Kumor, *Metryki*, 67.

Maria Zmijewska wrote that "the wedding and the rituals associated with it were the most important event in the personal life of the population (...). It was accompanied by carefully cultivated centuries-old traditions."[45] Among these traditions was the betrothal, which was not mentioned in the Tametsi decree.[46] Through intermediaries or matchmakers, after the courtship, which happened quickly, an engagement took place. In the Żarki area, these took place on Thursday late in the evening, where a matchmaker entering the home of the bride-to-be would call out: "Don't you have a heifer to sell?"[47] At a smaller or larger celebration, a marriage contract was made between the family, which defined the personal and property relations of the future spouses and the amount of the dowry. Determining the amount of the dowry was considered "a relic of the pagan custom of marriage by purchase."[48] At the time of betrothal, the exchange of wreaths took place as a mutual pledge of future marriage. In pre-Tridentine tradition, the act of betrothal was more important than the act of marriage itself. Thus, the act of marriage was a natural consequence of the betrothal, an agreement between two parties, and when it came to fruition, one would go to the rectory to announce the marriage.[49]

"According to the old custom, the young man and the girl should invite[50] witnesses and guests to the wedding." The quote shows that the newlywed couple were the initiator of the social interaction. This information is important for the process of reconstructing the directed network.

The Concept for Applying the Network Analysis Method

First Stage: Definition of the Nodes and Relationships

In the marriage registers of the parish of Zarki, three types of nodes can be distinguished: clergy, brides and grooms, and witnesses, the so-called ordinary witnesses. The clergy is excluded ex officio because of its role, since the purpose

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[45] Małgorzata Żmijewska, *Ludność parafii tyskiej od 1749 roku do połowy XIX wieku w świetle ksiąg metrykalnych: studium demograficzno-społeczne* (PhD diss., Uniwersytet Śląski, Wydział Nauk Społecznych, 2008), 107.

[46] Abraham, *Forma*, 26.

[47] Michał Fedorowski, *Lud okolic Żarek, Siewierza i Pilicy. Jego zwyczaje, sposób życia, obrzędy, podania, gusła, zabobony, pieśni, zabawy, przysłowia, zagadki i właściwości mowy*, vol. 1 (Księgarnia M. Arcta, 1888), 35. The wedding traditions of the area were more elaborate, and did not end with just a proposal.

[48] Andrzej Chwalba, *Obyczaje w Polsce. Od średniowiecza do czasów współczesnych* (Wydawnictwo Naukowe PWN, 2015), 36.

[49] Abraham, *Forma*, 10–11; Przemysław Dąbkowski, *Zarys prawa polskiego prywatnego: podręcznik do nauki uniwersyteckiej* (K. S. Jakubowski, 1921), 95.

[50] Fedorowski, *Lud*, 37. The descriptions included in the work of the customs related to the invitation of guests show that these were highly elaborate and intense ceremonies.

of reconstructing the network is to study the relationships between the inhabitants of the parish of Żarki.[51] Two types of nodes remain: nurses and ordinary witnesses. Graphically, they are represented as circles (Figure 2).

Figure 2. The main actors, the fiancés and the witness

Notation in circles signifies: **N**—fiancé/ fiancée (from the Latin *nupturient*, fiancé, bridegroom, betrothed);[52] **T**—witness (from the Latin *testis*—witness).[53] In addition, colors were introduced to better distinguish the border: **N**—blue and **T**—green (Figure 2). Looking more closely at the **N** elements, a further division into two sets comes to mind: male and female (Figure 3).

Figure 3. The main actors, the fiancé, the fiancée and the witness

Which, of course, changes the notation of the nodes, where $\mathbf{N_{M1}}$ means: **N**–bridegroom, **M**–man (Latin: masculus); analogous to $\mathbf{N_{F1}}$: **N**–bride, **F**–woman (Latin: femina) in both cases the digit $_1$ symbolically represents the ordinal number. At the same time, the **T** node type has been expanded to include an ordinal number.

Establishing the marriage relationship between the nodes of the bridegroom and bride is as follows: nupturient $\mathbf{N_{M1}}$ (male), is one party to the contract and $\mathbf{N_{F1}}$ (female) is the other party to the contract (see Figure 3). As they stand on the wedding dais, they express their mutual will to marry. This proceeds as follows: $\mathbf{N_{M1}}$ expresses a message in the direction of $\mathbf{N_{F1}}$ while simultaneously $\mathbf{N_{F1}}$ expresses a message in the direction of $\mathbf{N_{M1}}$, so both sides interact (Figure 4).

[51] Information on the parish priests who assisted with the wedding ceremony will be included in the creation of a database of relationships.

[52] Janusz Sondel, *Słownik łacińsko-polski dla prawników i historyków* (Universitas, 2009), 669.

[53] Sondel, *Słownik* , 942.

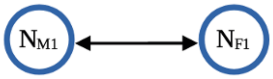
Figure 4. The marital relationship

From the point of view of the social network, Dorothea Jansen explains the directed relationship as follows: if **A** is the son of **B** then **B** cannot simultaneously be the father of **A**. This is a directed relationship. If, on the other hand, we look at the relationship of kinship, this is an undirected relationship, for if **A** is related to **B** then **B** is related to **A**. All relationships based on common membership are undirected in nature.[54]

The betrothed are not yet at the stage of kinship, since they are just establishing a family unit. Dispensations by virtue of kinship between the nuptial couple appear in the marriage registers. But in forming this relationship, the question is not whether $\mathbf{N_{M1}}$ is a relative of $\mathbf{N_{F1}}$, but whether $\mathbf{N_{M1}}$ takes $\mathbf{N_{F1}}$ as his wife and whether $\mathbf{N_{F1}}$ takes $\mathbf{N_{M1}}$ as her husband. By virtue of this, a mutual directed relationship is formed,[55] which the literature also calls "the reciprocity of ties."[56]

In the graphs created by social network analysis, a two-way link will be represented as a double arrow (Figure 5).

Figure 5. The marital relationship: a double arrow



The resulting graph type is called a dyad in the literature[57]—the smallest construct in graph theory and social network structure (two points and the relationship(s) between them).

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[54] "(…), ob die Beziehung gerichtet ist oder nicht. Eine Abstammungsbeziehung ist z.B. gerichtet. Sie kann auch gar nicht symmetrisch sein: wenn A der Sohn von B ist, kann B nicht gleichzeitig der Sohn von A sein. Untersucht man stattdessen die Verwandtschaftsbeziehungen zwischen A und B, so ist die Beziehung ungerichtet: wenn A mit B verwandt ist, so ist auch B mit A verwandt. Alle Relationen, die auf gemeinsamen Mitgliedschaften beruhen, sind ungerichteter Natur." Citation from Jansen, *Einführung*, 73.

[55] Jansen, *Einführung*, 61.

[56] Yang et al., *Social Network*, 10. Jansen, *Einführung*, 61.

[57] Yang et al., *Social Network*, 10; Jansen, *Einführung*, 61.

Notation for Figure 5:

$$V = \{N_{M1}, N_{F1}\}, \quad (2)$$

$$A = \{(N_{M1}, N_{F1}), (N_{F1}, N_{M1})\}. \quad (3)$$

Figure 6 below visualizes three possible relationships for establishing a witness relationship between $\mathbf{N_{M1}}$ (the bridegroom) and $\mathbf{T_1}$ (the customary witness); two relationships directed from $\mathbf{N_{M1}}$ toward $\mathbf{T_1}$ and from $\mathbf{T_1}$ toward $\mathbf{N_{M1}}$, and one $\mathbf{N_{M1}}$ undirected relationship toward $\mathbf{T_1}$ and from $\mathbf{T_1}$ toward $\mathbf{N_{M1}}$.

Figure 6. Relationship between the bridegroom and witness or between the witness and bridegroom

From folk tradition, it is known that the bride and groom invited witnesses and guests to the wedding. Thus, we get a directed relationship: $\mathbf{N_{M1}}$ and $\mathbf{N_{F1}}$ ask $\mathbf{T_1}$ to be their witness (Figure 7), where the nupturients will be the initial nodes (sender) and the witness(es) will be the end nodes (receiver) of the information flow.[58]

Figure 7. The witness relationship between the prospective spouses and the witness—dyad

The combination of the three defined basic elements ($\mathbf{N_{M1}}$, $\mathbf{N_{F1}}$, $\mathbf{T_1}$) forms a triad (Figure 8).

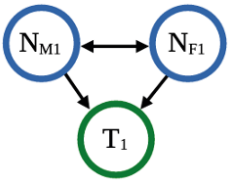
Notation for Figure 8:

$$V = \{N_{M1}, N_{F1}, T1\}, \quad (4)$$

$$A = \{(N_{M1}, N_{F1}), (N_{F1}, N_{M1}), (N_{M1}, T1), (N_{F1}, T1)\}. \quad (5)$$

[58] Yang et al., *Social Network*, 10.

Figure 8. Relationship between prospective spouses and the witness—triad



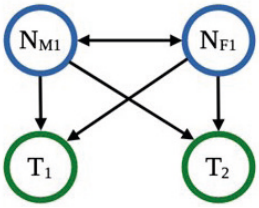
With that, the marital relationship is symmetrical, bilateral, mutual, and the witnessing relationship is unilateral, and asymmetrical. The resulting arrangement is transitive—all the components have been interconnected and have formed a triad.[59]

Second Stage: Creating Models and Scenarios

Scenario Number 1—Diagram 1

After defining the types of nodes, as well as the relationships in the 18th-century social network, a first diagram emerged based on the standard marriage certificate notation: a bridegroom and bride, assisted by two witnesses, stand on the wedding dais.

Diagram 1



Notation:

$$V = \{N_{M1}, N_{F1}, T_1, T_2\} \quad (6)$$

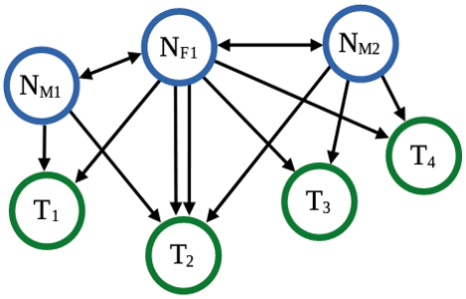
$$A = \{(N_{M1}, N_{F1}), (N_{F1}, N_{M1}), (N_{M1}, T_1), (N_{F1}, T_1), (N_{M1}, T_2), (N_{F1}, T_2)\} \quad (7)$$

[59] Jansen, *Einführung*, 62–64; Knoke and Yang, *Social Network*, 72–76; Yang et al., *Social Network*, 15.

Scenario number 2—Diagram 2

Scenario: the groom, a bachelor ($\mathbf{N_{M1}}$), and the bride, a spinster ($\mathbf{N_{F1}}$), stand on the wedding dais, and two people ($\mathbf{T_1}$, $\mathbf{T_2}$) have been asked to be witnesses. Marital life ends after two years, due to the death of the husband. The new widow, after two months, once again stands on the wedding dais. In other words, the bride, a widow ($\mathbf{N_{F1}}$) is taking a new spouse, a bachelor ($\mathbf{N_{M2}}$). At the second wedding ceremony, the number of witnesses has increased from two to three ($\mathbf{T_2}$, $\mathbf{T_3}$, $\mathbf{T_4}$)—Diagram 2.

Diagram 2



Notation:

$$V = \{N_{M1}, N_{F1}, N_{M2}, T_1, T_2, T_3, T_4\} \tag{8}$$

$$A = \{(N_{M1}, N_{F1}), (N_{F1}, N_{M1}), (N_{M1}, T_1), (N_{F1}, T_1), (N_{M1}, T_2), (N_{F1}, T_2), (N_{F1}, N_{M2}), (N_{M2}, N_{F1}), (N_{F1}, T_2), (N_{F1}, T_3), (N_{F1}, T_4), (N_{M2}, T_2), (N_{M2}, T_3), (N_{M2}, T_4)\} \tag{9}$$

The model created depicts two weddings at a certain interval. In the construct, attention is drawn to the witness $\mathbf{T_2}$, with as many as four arrows pointed at him or her—(s)he took part not only in the first wedding ceremony, but also in the second. Such an arrangement may signal possible kinship or affinity with the bride.

Scenario Number 3—Diagram 3

The next scenario: the groom, a bachelor ($\mathbf{N_{M1}}$), marries his bride, a spinster ($\mathbf{N_{F1}}$). The wedding ceremony is witnessed by two people ($\mathbf{T_1}$, $\mathbf{T_2}$). After two years, $\mathbf{N_{M1}}$ is widowed, as his wife ($\mathbf{N_{F1}}$) dies giving birth to their second child. The groom, now a widower ($\mathbf{N_{M1}}$), enters into a new marriage with his bride, a spinster ($\mathbf{N_{F2}}$). Two people ($\mathbf{T_3}$, $\mathbf{T_4}$), who have not been witnesses before (in this small network), are asked to be witnesses. After some time, $\mathbf{N_{M1}}$ dies. The widow ($\mathbf{N_{F2}}$),

because of her young children, remarries. The bride/widow ($\mathbf{N_{F2}}$), and her groom, a bachelor ($\mathbf{N_{M2}}$), ask two new people to be witnesses ($\mathbf{T_5}$, $\mathbf{T_6}$)—Diagram 3.

Notation:

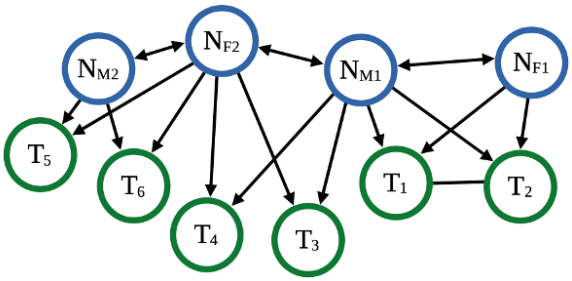
$$V = \{N_{M1}, N_{F1}, N_{M2}, N_{F2}, T_1, T_2, T_3, T_4, T_5, T_6\} \tag{10}$$

$$\begin{aligned} A = \{&(N_{M1}, N_{F1}), (N_{F1}, N_{M1}), (N_{M1}, T_1), (N_{F1}, T_1), (N_{M1}, T_2),\\ &(N_{F1}, T_2), (N_{F2}, N_{M1}), (N_{M1}, N_{F2}), (N_{F2}, T_3), (N_{F2}, T_4),\\ &(N_{M1}, T_3), (N_{M1}, T_4), (N_{F2}, N_{M2}), (N_{M2}, N_{F2}), (N_{M2}, T_5),\\ &(N_{M2}, T_6), (N_{F2}, T_5), (N_{F2}, T_6)\} \end{aligned} \tag{11}$$

$$E = \{\{T_1, T_2\}\} \tag{12}$$

The model reconstructs three marriages, with ceremonies attended by different witnesses. The novelty of this diagram is the introduction of information concerning the relationship between witnesses $\mathbf{T_1}$ and $\mathbf{T_2}$ i.e., they were already declared to be married. As a result, there was an affinity relationship between them, which is undirected. Directed and undirected connections in one graph are perfectly possible.[60]

Diagram 3



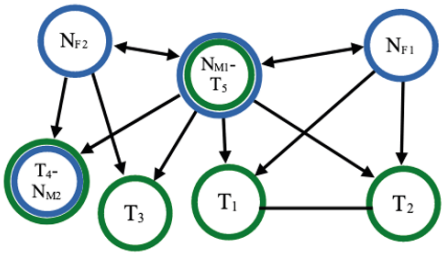
Scenario Number 4—Diagram 4

Another scenario: a bachelor ($\mathbf{N_{M1}}$) marries a spinster ($\mathbf{N_{F1}}$), witnessed by persons ($\mathbf{T_1}$, $\mathbf{T_2}$) who are related to each other. After two years, $\mathbf{N_{F1}}$ dies. The groom, a widower ($\mathbf{N_{M1}}$), enters into a new marriage with a spinster ($\mathbf{N_{F2}}$). Two new people ($\mathbf{T_3}$, $\mathbf{T_4}$) are asked to be witnesses. In the same year, in the same network, witness $\mathbf{T_4}$ is widowed and marries again. And he requests as witness $\mathbf{N_{M1}}$, who has already been assigned to node $\mathbf{N_{M1}}$ in the graph. The question arises how best to graphically

[60] "It is possible to combine both directed and undirected ties into one network," Yang et al., *Social Network*, 10.

represent the above situation. How do we make node $\mathbf{N_{M2}}$ out of node $\mathbf{T_4}$, and make a new node $\mathbf{T_5}$ out of node $\mathbf{N_{M1}}$ (Diagram 4)?

Diagram 4

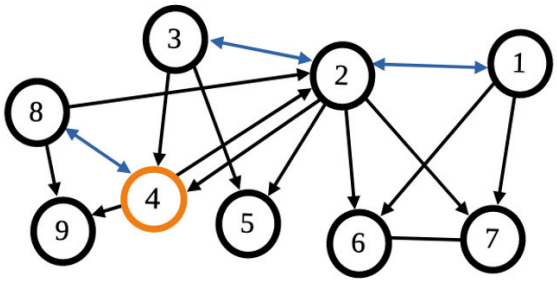


And this is where we move to the next stage of the concept.

Third Stage—Modifying the Concept

For understanding simple scenarios, the previous concept worked perfectly. It is not a problem if spouses remain in the network within their class and occasionally enter into new marriages. Similarly, the functioning of witnesses in the same network can be explained. This all changes when the same node plays more than one role in the same network. In the initial analysis of the source material from which nodes/actors were extracted, the attribution aspect prevailed. Looking for similar attributes among the participants of the events, on the basis of which they were categorised, the natural consequence was the extraction of three classes ($\mathbf{N_M}$, $\mathbf{N_F}$, $\mathbf{T}$). However, this is too rigid for the reconstruction of the social network in time and space. The above analysis modifies the original assumptions of the concept. Instead of three categories of one and the same set, a large set of nodes appears without any further specifications (Diagram 5).

Diagram 5



Marital relationships in Diagram 5 have been colored blue to distinguish them from other relationships.

Current notation:

$$V = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}, \tag{13}$$

$$A = \{(1,2), (2,1), (1,7), (1,6,), (2,7), (2,6), (2,3), (3,2), (2,5), (2,4), (3,5), (3,4), (4,8), (8,4), (4,9), (4,2), (8,9), (8,2)\}, \tag{14}$$

$$E = \{\{6, 7\}\}. \tag{15}$$

A simple analysis of node number four (colored orange) in Diagram 5 in terms of relationships can be as follows:

- node four was asked to witness the wedding of a couple (2–3)—witness relationship,
- node four agreed to marry node number eight—marriage relationship,
- node eight agreed to marry node number four—marriage relationship,
- node four asked node number two and node number nine to participate in the wedding ceremony—witness relationship.

To summarize: the attributes[61] of an individual (whether one studies individuals, groups or institutions) are interesting and important, but the key to social network research is provided by the analysis of the relationships between them, in the network.[62] For as the above examples show, positions and roles change over time and space. For the research topic presented here, a relational approach to reconstructing the 18th century network is more appropriate than an attributional one.

Preparing the Database for Network Visualization Using the Gephi Program

So far in this article, graphs have been used as abstract models to discuss issues of simple network structures. In Social Network Analysis, different types of computer programs are used to visualize networks. This article uses the Gephi program.[63] To use it, it is necessary to convert the research material into two simple

[61] Attributes can be such things as position, occupation, or role in society.

[62] Jürgen Pfeffer, "Visualisierung sozialer Netzwerke," *Netzwerkanalyse und Netzwerktheorie. Ein neues Paradigma in den Sozialwissenschaften*, ed. Christian Stegbauer (Verlag für Sozialwissenschaften, 2010): 231–38, https://doi.org/10.1007/978-3-531-92029-0_17; Sierocki, „Analiza," 231–36.

[63] Gephi is an open-source program. From their website: "Gephi is the leading visualization and exploration software for all kinds of graphs and networks. Gephi is open-source and free." "Gephi Makes Graphs Handy," Gephi home page, accessed August 29, 2024, https://gephi.org.

tables, one for nodes and the other for relationships. Microsoft Excel can be used to generate such tables.

The table of nodes (nodelist) should contain at least two columns: the first column, "ID," is ordinal numbers (which are very important because they act as an identification key), and the second column, "label," can contain their terms. It is important that the data is not repeated, i.e., there is only one actor with the label Czyż in the whole network. If, on the other hand, there are more people with the surname Czyż in the source material, it is necessary to check, if possible, which people are involved. In this case, it will be helpful to enter an additional criterion in the table for distinguishing actors; for example, the date of baptism will be helpful.

Table 1. List of nodes

ID	Label	Sex	Date of baptism	Date of burial
1	Czyż	Female	1718-03-12	
2	Baran	Male		
3	Karoń	Female		
4	Wapler	Male		
5	Werner	Male		
6	Fider	Male		
7	Fider	Female		1766-01-11
8	Frezer	Female		
9	Laykauf	Male		
10	Serwin	Female		
11	Legutek	Male		

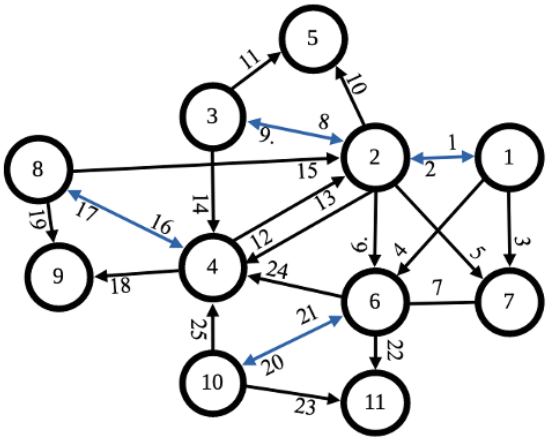
Source: own work.

Table number 1 contains a pair of such criteria, such as surname or forename (label), sex, date of baptism or burial (viewed through the prism of 18th-century circumstances). What additional information the node table will contain is an individual decision for each researcher.

Table 2 gives examples of links/relationship (edgelist) parameters between nodes that the marriage records of an 18th century parish can provide. Two columns are required: source and target. In the example of Table 2, the first column labeled ID is created by Gephi (so that each row of the table has a unique assignment)

and does not need to be included in the database. For the following example, it was created manually. According to Table 2, the relationships connecting the nodes in Diagram 6 are numbered.

Diagram 6



Analyzing relationship number twenty-two (Table 2 and Diagram 6), which connects the nodes numbered six and eleven, we can say that the relationship is directed and belongs to the witness category. Adding the information from the list of relationships (Table 2), we learn that actor number six was a widower and there was no kinship between the nodes.

Another example of analysis for node six in terms of relationships (Table 2 and Diagram 6): in 1765 he was a witness with his wife (number seven in Table 1) at the wedding of a spinster from the house of Czyż and a bachelor named Baran—relationship number seven between nodes six and seven is a kind of affinity relationship. In 1767, as a widower, he remarried (an affinity relationship—number twenty in Diagram 6) without specifying the marital status of his future spouse. He asked two people to be his witnesses. Witness number four (witness relationship number twenty-four in Diagram 6) was the mayor of a small town at the time (suggestion: was he asked to be a witness for the prestige of the groom?) The wedding was blessed by priest Stanisław Tagibor.

Table 2. List of connections

ID	Source	Target	Edge type	Rel. type	Mar.st.: so.	Mar.st: target	Fam. rel.	Dis.	Occupation: so.	Occupation: target	Date of marriage	Parish priest	Parish: so.	Parish: target	Place: so.	Place: target
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	1 – Czyż	2 – Baran	a	mar.	s.	b.	kin.	ja		miller	1765-01-03	Wyporski Augustus	Żarki	Niegowa	Jaworznik	Łutowiec
2	2 – Baran	1 – Czyż	a	mar.	b.	s	kin.	ja	miller		1765-01-03	Wyporski Augustus	Niegowa	Żarki	Łutowiec	Jaworznik
3	1 – Czyż	3 – Karoń	a	wit.	s.	w.	ab.				1765-01-03	Wyporski Augustus	Żarki	Żarki	Jaworznik	Żarki
4	1 – Czyż	6 – Fider	a	wit.	s.	h.	ab.				1765-01-03	Wyporski Augustus	Żarki	Żarki	Jaworznik	Żarki
5	2 – Baran	7 – Fider	a	wit.	b.	w.	ab.				1765-01-03	Wyporski Augustus	Żarki	Żarki	Łutowiec	Żarki
6	2 – Baran	6 – Fider	e	wit.	b.	h.	ab.				1765-01-03	Wyporski Augustus	Żarki	Żarki	Łutowiec	Żarki
7	6 – Fider	7 – Fider	a	aff.	w.	h.	aff.				1765-01-03	Wyporski Augustus	Żarki	Żarki	Żarki	Żarki
8	3 – Karoń	2 – Baran	a	mar.	s.	wd.	ab.				1767-12-15	Tagibor Stanisław	Żarki	Żarki	Jaroszów	Jaworznik
9	2 – Baran	3 – Karoń	a	mar.	wd.	s.	ab.		miller		1767-12-15	Tagibor Stanisław	Żarki	Żarki	Jaworznik	Jaroszów
10	2 – Baran	5 – Werner	a	wit.	wd.	br.	ab.		miller	miller	1767-12-15	Tagibor Stanisław	Żarki	Żarki	Jaworznik	Żarki
11	3 – Karoń	5 – Werner	a	wit.	s.	br.	ab.			miller	1767-12-15	Tagibor Stanisław	Żarki	Żarki	Jaroszów	Żarki
12	2 – Baran	4 – Wapler	a	wit.	wd.	br.	ab.			mayor	1767-12-15	Tagibor Stanisław	Żarki	Żarki	Jaworznik	Żarki

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
13	4 – Wapler	2 – Baran	a	wit.	wd.	w.	ab.		mayor		1767-12-28	Tagibor Stanisław	Żarki	Żarki	Żarki	Jaworznik
14	3 – Karoń	4 – Wapler	a	wit.	s.	br.	ab.			mayor	1767-12-15	Tagibor Stanisław	Żarki	Żarki	Jaroszów	Żarki
15	8 – Frezer	2 – Baran	a	wit.	ww.	w.	ab.				1767-12-28	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
16	8 – Frezer	4 – Wapler	a	mar.	ww	wd.	kin.			mayor	1767-12-28	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
17	4 – Wapler	8 – Frezer	a	mar.	wd.	w.	kin.		mayor		1767-12-28	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
18	4 – Wapler	9 – Laykauf	a	wit.	wd.	ab.	ab.		mayor		1767-12-28	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
19	8 – Frezer	9 – Laykauf	a	wit.	ww	ab.	ab.				1767-12-28	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
20	6 – Fider	10 – Serwin	a	mar.	wd.	ab.	ab.				1767-12-30	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
21	10 – Serwin	6 – Fider	a	mar.	ab.	wd.	ab.				1767-12-30	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
22	6 – Fider	11 – Legutek	a	wit.	wd.	ab.	ab.				1767-12-30	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
23	10 – Serwin	11 – Legutek	a	wit.	ab.	ab.	ab.				1767-12-30	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
24	6 – Fider	4 – Wapler	a	wit.	wd.	w.	ab.			mayor	1767-12-30	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
25	10 – Serwin	4 – Wapler	a	wit.	w.	wd.	ab.			mayor	1767-12-30	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki

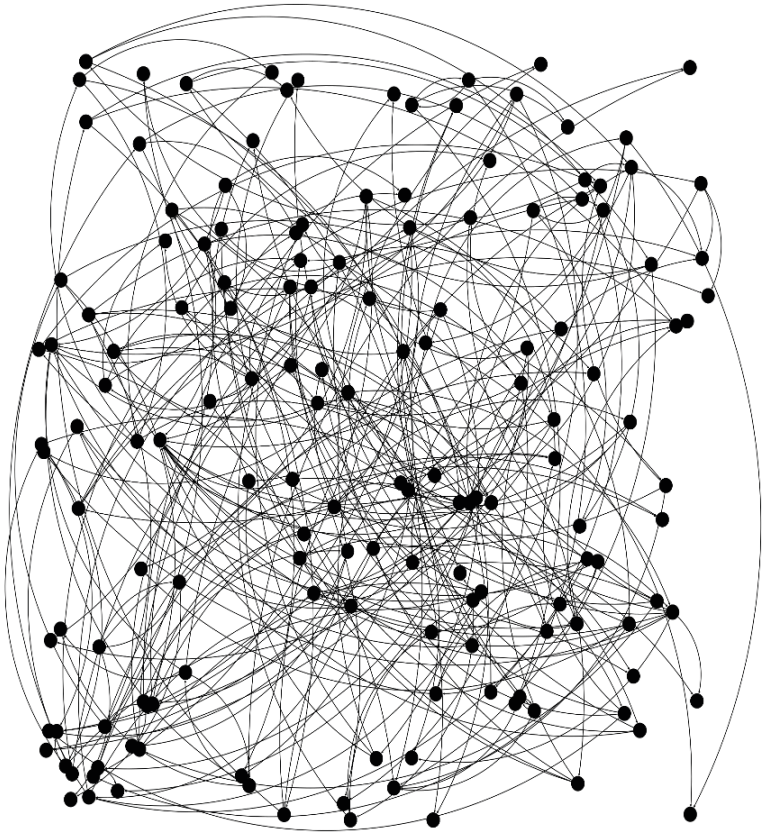
Explanation of abbreviations: **Table headings**: rel. type – type of relationship; mar. st.: so.–marital status: source; mar. st.: tar. – marital status: target; fam. rel. – family relationship; dis. – dispensation; occ.: so. – occupation: source; **information in table columns**: a – directed relationship; e – undirected relationship; mar. – married; wit. – witness; aff. – affinity; s. – spinster; b – bachelor; w.– wife; h. – husband; wd. – widower; w. – widow; ab. – information absent; kin. – kinship.

Source: own work based on https://www.familysearch.org, accessed August 24, 2024.

An Example of a Directed Network Based on the Żarki Parish Marriage Registers

Figure 9 shows the so-called raw graph. The Gephi program randomly generated it based on the input information (nodelist, edgelist) using the source material from the Marriage Register of 1718–1720.[64]

Figure 9. The social and community network of Żarki Parish residents (1718–1720)



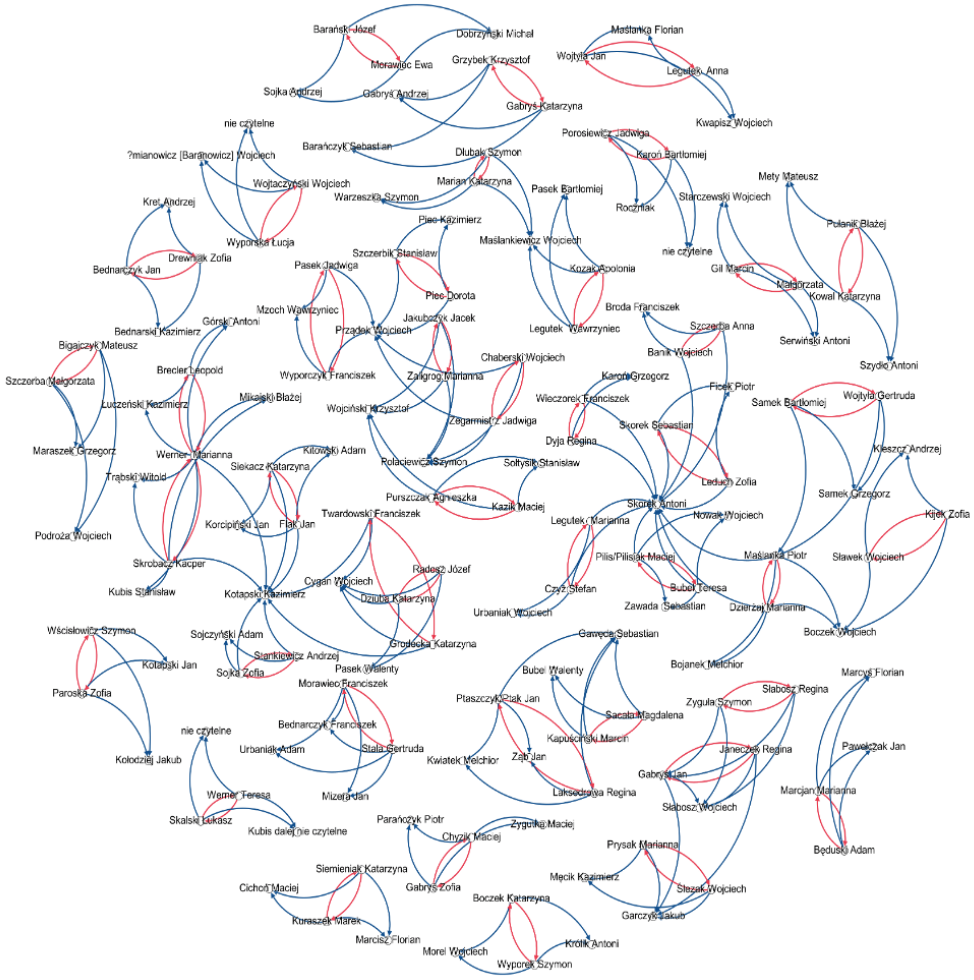
In this rather short period of time, the Żarki community recorded 154 actors (nodes)[65] and 266 directed relationships, of which 84 were marital relationships.

[64] Database: Family Search: https://www.familysearch.org/, accessed March 26, 2024. The entries are from the first series of the 1718–1770 marriage register.

[65] The clergy was excluded. See "First Stage," in this aricle.

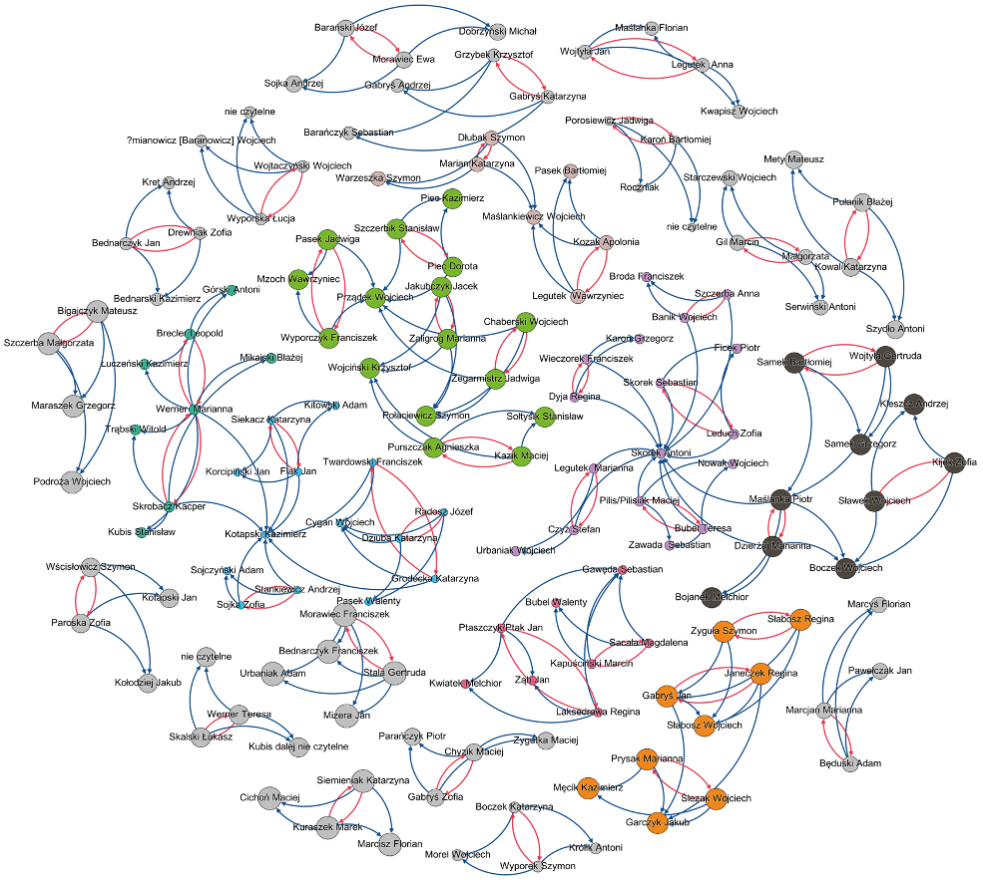
The number of marriages was 42. The shape of the network is more like a cluster of lines and points. For better visualization, the original network was further specified using the Fruchterman Reingold algorithm. This algorithm works on the principle of a spiral. Each node is subjected to forces of attraction and repulsion[66] to find its optimal position in the structure. In addition, marriage relationships are highlighted in red and node terms are added (modernized font)—Figure 10.

Figure 10. The social network of Żarki Parish residents (1718–1720). Fruchterman Reingold algorithm



[66] Pfeffer, "Visualisierung", 5–6.

Figure 11. The social and community network of Żarki Parish residents (1718–1720). Division according to modularity class



The generated network can be subjected to a variety of analyses provided by the Social Network Analysis method and included in the Gephi program. It is beyond the scope of this article to describe all the analytical or statistical tools of SNA. The following example is only an approximation of this method. Figure 11 shows smaller components (in green, orange, or black) isolated from the entire network, called clusters, modules, or cliques, whose structures can be isolated and subjected to further study of network connections. In addition, in the following network it is possible to distinguish individuals (Skorek Antoni or Kotapski Kazimierz), which have more directed relationships concentrated on themselves. These tendencies can be analyzed in terms of centrality coefficient (degree, agency or proximity).

Conclusions

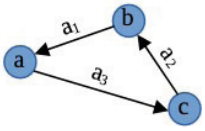
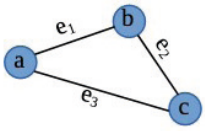
The results of the article are a series of models that visually represent the various stages of the idea of applying the Social Network Analysis method to historical demography. The basic concepts of graph, network, social network, nodes, directed and undirected relationships are outlined. From the combinations of the two smallest elements (nodes and relationships), the resulting structures made it possible to create the models described, abstractly but nevertheless on the basis of information from parish sources. The framework of the social-relational network consisting of the engaged couple and their witnesses was defined. Due to the fact that the clergy occupied the position of ex officio witnesses, they were indirectly excluded from the set of nodes, but information about them was included in the database of individual relationships. The diagrams created were intended to highlight the problem of the attributive reasoning of individuals and the role of relationships between them. In the center of interest of the social network are the connections/relationships between individuals, and only from this perspective the role of individuals in the network is studied, analyzed and described. Two types of relationships are distinguished: marital, which occurs between two prospective spouses, symmetrical with a directed, reciprocal nature, and witness, which occurs between prospective spouses and ordinary witnesses, asymmetrical with a directed nature. To visualize the network using computer programs, examples of tables were given to structure the database for their purposes. The final result was the social-social network of the parish of Żarki. Admittedly, the example only covers three years, but it is already possible to identify certain trends, such as the formation of cliques or the accumulation of relationships on a single node.

The limitations of the SNA method may be due to the research material, in this case marriage records. The social network thus constructed is only a rudimentary substitute for the community that actually existed in the 18th century. It is not clear from the marriage relationships defined above to what extent, for example, the betrothed were forced into this union. It is difficult to determine, and even more difficult to measure, whether these relationships were based on affection. It is also difficult to define kinship relationships among witnesses or between witnesses and prospective spouses based on surname coincidences. Another limitation may come from the method of compiling the database, as it involves a lot of work; painstakingly going through the registers, then collating and structuring the data for the SNA method.

Despite the limitations of the method, the cognitive benefits gained from it of small-town social structure can contribute to a better understanding of the dynamics of contemporary society.

APPENDIX

Appendix 1. Comparison of directed graph vs. undirected graph[1]

	Directed graph	Undirected graph
Formula	G_d= (V, A)[3] Directed Graph = (Vertex, Arc)	G = (V, E)[2] Graph = (Vertex,[4] Edge)
Meaning of abbreviations	G_d– directed graph V – vertex A – arc	G – graph V – vertex E – edge
Definition	A directed graph consists of two finite sets: vertices (V) and arcs (A). The set of vertices is not empty, while the set of arcs can be empty. Where a pair of vertices has been assigned to each arc (A).	An undirected graph consists of two finite sets: vertices (V) and edges (E). The set of vertices is not empty, while the set of edges can be empty. Where each edge (E) has been assigned a pair of vertices (although not always different).
Other names for V	node, point	node, point
Other names for A/E	A: directed edge, directed line, arc, arrow	E: undirected edge, line
Notation form for V: example	V = {a,b,c}	V = {a,b,c}
Notation form for A/E: example	A = {a_1, a_2, a_3} a_1 = {(b,a)}[5]	E = {e_1, e_2, e_3} e_1 = {a,b}[4]
Fundamental differences between A and E	A: The connection works only in the direction of the directed edge, that is, from **b** to **a,** not from **a** to **b**.	E: The direction in the graph can be from **a** to **b** and from **b** to **a**.
Start/end node	a_1 = (b,a) point b is the start point of edge a_1; point a is the end point of edge a_1.	e_1 = (a,b) points a and b are the end points of the line/relationship e_1.
Examples		

Source: own work based on: John Clark and Derek Allan Holton, *Graphentheorie Grundlagen und Anwendungen*, Spektrum 1994; Peter Trittmann, *Graphentheorie: eine anwendungsorientierte Einführung*, Hanser Verlag, 2011; Robin J. Wilson, *Introduction to Graph Theory*, Longman, 1996.

"The language of graph theory is not standard—all authors have their own terminology (…). Any such definition is perfectly valid, provided that it is used consistently" (Wilson, *Introduction*, 9). For this reason, other forms of notation are given below.

1. As per Jacek M. Wojciechowski and Krzysztof Pieńkosz, *Grafy i sieci*, (Wydawnictwo Naukowe PWN, 2013), 1. An undirected graph is referred to as a non-oriented graph, while a directed graph is referred to as an oriented graph.
2. Another form of notation: G = (V(G)), E(G)) as per Clark and Holton, *Graphentheorie*, 2.
3. Another form of notation: G = (V, E) as per Trittmann, *Graphentheorie*, 127, or D = (V(D)), A(D)) as per Wilson, *Introduction to Graph Theory*, 100.
4. Or *nodes*: Wilson*, Introduction to Graph Theory*, 8.
5. Another form of notation: $e_1 = \{a,b\}$ as per Trittmann, *Graphentheorie*, 13; or $e_1 = ab$ as per Wilson, *Introduction*, 8.
6. Another form of notation: $a_1 = ba$ as per Wilson, *Introduction*, 101.
7. Undirected graph G = (V, E) can be obtained from the directed graph $G_d = (V, A)$, when one moves gradually from A to A' $\supset$ A by adding $a_1 = (b,a) \in A \subset A'$, a_1 '= (a,b) and identifying a_1 and a_1' using $e_1 = (a,b) \in E$. Therefore, undirected graphs are general graphs. Clark and Holton, *Graphentheorie*, 252–53; Wilson, *Introduction*, 100–102.

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Application of the Social Network Analysis Method to the Reconstruction of a Social and Kinship Network Based on the Marriage Registers of the 18th Century Parish of Żarki

Summary

The article outlines the practical applicability of the SNA method for reconstructing the social network of a small town community in the 18th century, based on the marriage registers of the parish of Żarki. After reviewing the main concepts of social network analysis (nodes, directed and undirected relationships), they were further defined on graphical models. A step-by-step discussion of the concept using the SNA method to reconstruct social structures is intended to make the problem of attributionality of nodes and relationships between them in the network more apparent. As a result, the initial concept of implementing network reconstruction from the perspective of nodes/actors is changed in favor of relationships. The Gephi program was used to visualize the network. The final result is an example of a directed network created using the marriage registers of the Żarki parish from 1718–1720.

The article is a practical presentation of the application of the SNA method using a demographic source.

Zastosowanie metody analizy sieci społecznościowej do rekonstrukcji sieci społeczno-towarzyskiej na przykładzie ksiąg zaślubin XVIII-wiecznej parafii żareckiej

Streszczenie

Artykuł przedstawia możliwości praktycznego zastosowanie metody SNA do rekonstrukcji XVIII-wiecznej sieci społeczno-towarzyskiej małomiasteczkowej społeczności na przykładzie ksiąg zaślubionych parafii żareckiej. Po zapoznaniu się z głównymi pojęciami analizy sieci społecznej (węzeł, relacja skierowana i nieskierowana) zostały one jeszcze bliżej zdefiniowane na graficznych modelach. Etapowe omawianie konceptu z wykorzystaniem metody SNA w celu odtworzenia struktur społecznych ma bardziej uwidocznić problematykę atrybutowości węzłów i relacji między nimi w sieci. Konsekwencją tego jest zmiana początkowego konceptu realizacji odtwarzania sieci z punktu widzenia węzłów/aktorów na korzyść relacji. Na potrzeby wizualizacji sieci wykorzystano oprogramowanie Gephi. Efektem końcowym jest przykład sieci skierowanej utworzonej na podstawie ksiąg zaślubionych parafii żareckiej z lat 1718–1720. Artykuł ma charakter praktycznego przedstawienia zastosowania metody SNA z wykorzystaniem źródła demograficznego.

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Zastosowanie metody analizy sieci społecznościowej do rekonstrukcji sieci społeczno-towarzyskiej na przykładzie ksiąg zaślubin XVIII-wiecznej parafii żareckiej

Application of the Social Network Analysis Method to the Reconstruction of a Social and Kinship Network Based on the Marriage Registers of the 18th Century Parish of Żarki

Abstrakt

Celem niniejszego artykułu jest przedstawienie praktycznego zastosowania metody analizy sieci społecznościowej (SNA) w badaniach demograficzno-historycznych. Metodę tę wykorzystano do rekonstrukcji sieci społeczno-towarzyskiej XVIII-wiecznej parafii żareckiej na bazie ksiąg zaślubionych. Metoda SNA wśród polskich historyków jest jeszcze rzadko stosowana. W artykule posłużono się modelami grafów, stworzonymi na podstawie scenariuszy, dla lepszego przeanalizowania roli dwóch podstawowych pojęć (węzła i relacji) w sieci społecznej, czego wynikiem jest wyszczególnienie centralnej roli relacji w sieci. Opisano relacje: małżeństwa, świadkowania

Abstract

The purpose of this article is to describe a practical application of the Social Network Analysis (SNA) method in demographic and historical research. It was used to reconstruct the social and kinship network of the 18th-century parish of Żarki on the basis of marriage registers. The SNA method is still rarely used by Polish historians. The article uses mathematical graph models, created on the basis of scenarios, to better analyze the role of two basic concepts (nodes and kinship) in the social network, resulting in the specification of the central role of kinship in the network. The relationships described in the article are those of marriage, testimony and kinship.

i powinowactwa. Program Gephie, używany do wizualizacji sieci, został wykorzystany do wygenerowania sieci skierowanej parafii żareckiej (1718–1720) jako przykład małomiasteczkowej społeczności.

The Gephi network visualization program was used to generate a digraph of the parish of Żarki (1718–1720), as an example of a small town community.

Słowa kluczowe

parafia żarecka, XVIII wiek, SNA, analiza sieci społecznościowych, struktura społeczna, sieć społeczno-towarzyska, węzły, relacje, połączenie skierowane, połączenie nieskierowane, połączenie obustronne, relacja małżeńska, relacja świadkowania, relacja powinowactwo/pokrewieństwo

Keywords

Żarki parish, 18th century, SNA, social network analysis, social structure, social network, nodes, relationships, directed node, undirected node, reciprocal node, marital relationship, witness relationship, kinship/affinity relationship

Wprowadzenie

„Błędy to droga do prawdy" (Fiodor Dostojewski)

Sieci społeczne jako fenomen realnego świata egzystowały i egzystują niezależnie od przeprowadzanych nad nimi badań. Niall Fergusson pisze: „żyjemy w epoce sieci"[1] i podkreśla, że świadomość dla tego zjawiska w dzisiejszej rzeczywistości coraz bardziej wzrasta. Jednak aby zrozumieć mechanizmy sieci działające w obecnych czasach, należy przebadać te istniejące w przeszłości, nawet te najmniejsze[2].

Próba rekonstrukcji XVIII-wiecznej sieci społecznej, szczególnie tej małomiasteczkowej, o charakterze miejsko-wiejskim, jest dla historyka dużym wyzwaniem, głównie z powodu utrudnionej dostępności do różnego rodzaju materiałów źródłowych (dokumenty, pamiętniki, relacje, rejestracje ludności kościelne i świeckie, spisy podatkowe itp.), na podstawie których można odtworzyć struktury powiązań międzyludzkich. Badaczowi pozostają czasami do dyspozycji jedynie księgi parafialne zaliczane do źródeł demograficznych. Ta forma źródła pozwala w pewnym stopniu[3] odtworzyć obiektywną rzeczywistość osadzoną w czasie i przestrzeni.

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[1] Niall Ferguson, *Rynek i ratusz. O ukrytej sieci powiązań, która rządzi światem*, tłum. Wojciech Tyszka, wyd. 2 (Wydawnictwo Literackie, 2024), 37.

[2] Ferguson, *Rynek*, 38.

[3] Irena Gieysztorowa, *Wstęp do demografii staropolskiej* (PWN, 1976); taż, „Niebezpieczeństwa metodyczne polskich badań metrykalnych XVII–XVIII wieku", *Kwartalnik Historii Kultury Materialnej* 19, nr 4 (1971): 557–603.

Tekst artykułu jest próbą scharakteryzowania praktycznego wykorzystania metody analizy sieci społecznościowej (SNA – Social Network Analysis) do rekonstrukcji sieci społeczno-towarzyskiej XVIII-wiecznego małomiasteczkowego społeczeństwa, z wykorzystaniem ksiąg zaślubin.

Korzenie metody Analizy Sieci Społecznościowej wywodzą się między innymi z socjologii, która wykorzystuje ją do analizy we współczesnych społecznościach. Na podstawie ankiet, formularzy z odpowiednio sformułowanymi pytaniami, zostają odtwarzane sieci społeczne. Już tutaj podkreśla się fakt, że jest to tylko fragment pewnej rzeczywistości, a międzyludzkie interakcje są bardziej skomplikowane i wielopoziomowe. Historyk, sięgając po rejestry parafialne z XVIII wieku, ma świadomość, że nie spisano ich z myślą o tym, że zostaną kiedyś wykorzystane do odtwarzania sieci społecznych metodą SNA. Pomimo wszystko niewątpliwą zaletą tej metody jest możliwość ustrukturyzowania, przeanalizowania dużej ilości danych i wychwycenia ewentualnych procesów, które trudno jest zauważyć konwencjonalnymi metodami. Metoda Analizy Sieci Społecznościowej wykorzystuje do tego celu między innymi technikę grafów. Zaletą grafu jest jego plastyczność i łatwość przystosowania do różnych dziedzin nauki[4], aczkolwiek matematyczne podejście SNA do tworzenia grafów może sprawiać trudności.

Przedmiotem badań jest XVIII-wieczna społeczność parafii żareckiej, która do roku 1795 administracyjnie leżała w obrębie województwa krakowskiego i powiatu lelowskiego, a jej właścicielem był ród Męcińskich z Kurozwęk herbu Poraj[5]. Sieć społeczno-towarzyska tej parafii będzie rekonstruowana na podstawie ksiąg zaślubin[6]. W demografii przedstatystycznej księgi zaślubionych są zaliczane (spośród trzech serii – ślubów, ochrzczonych i zmarłych) do najrzetelniej prowadzonych[7]. Księgi metrykalne parafii żareckiej z tego okresu zostały zinwentaryzowane i są przechowywane w Archiwum Diecezjalnym w Częstochowie[8]. Założeniem badawczym jest ujęcie dwóch generacji w przestrzeni czasowej od 1718 do 1795 roku

[4] W rozmaitych naukach wykorzystuje się graf jako element pomocniczy, służący do lepszego przedstawienia badanych zależności.

[5] Parafia żarecka położona jest w Jurze Krakowsko-Częstochowskiej w województwie śląskim. Najstarszą monografię spisał Stanisław Ufniarski, *Dzieje Parafii Żareckiej* (b.d.), Jasna Góra; najnowszą – Jacek Szpak, *Dzieje Żarek – Leśniowa – Przewodziszowic: do 1870 roku* (Wydawnictwo Cum Laude, 2023).

[6] Najstarsze księgi metrykalne tej parafii to: Lieber Baptizatorum od roku 1696, Liber Mortuorum od roku 1718 i Liber Copulatorum od roku 1718. Przechowywane są w Archiwum Archidiecezjalnym w Częstochowie. Do pracy badawczej wykorzystuje się bazę danych „Family Search". Wszystkie trzy serie ksiąg wykazują względną kompletność. Stwierdzono, że seria Liber Mortuorum 1718–1757 nie odnotowała roku 1723.

[7] Gieysztorowa, „Niebezpieczeństwa", 588; taż, *Wstęp*, 251–252.

[8] Jan Związek, „Inwentarz łacińskich ksiąg metrykalnych Archiwum Diecezjalnego w Częstochowie", *Archiwa, Biblioteki i Muzea Kościelne* 37 (1978): 175–220.

w formie sieci skierowanej. Tak zrekonstruowana sieć zostanie poddana wielostronnym analizom badawczym dostarczanym przez metodę SNA: metodom statystycznym (obliczanie średnich arytmetycznych, wag czy korelacji), analizom z punktu widzenia całej sieci: gęstości, spójności, centralizacji, tworzenia grup czy klik. Poza tym analizie pod kątem jednostki „ego-sieci": prestiżu, pozycji w grupie czy umiejscowienia na tle całej sieci; przeanalizowaniu życia społecznego, między innymi pod względem cech demograficznych: wieku nupturientów[9] przy pierwszych, jak i wtórnych małżeństwach, mobilności nowożeńców, doboru partnerów i świadków oraz ustalenie, czy i z jakich struktur społecznych byli dobierani partnerzy lub świadkowie. Co więcej, tak zrekonstruowana sieć może przybliżyć niuanse relacji między mieszkańcami, a także interakcje między różnymi grupami społecznymi: drobną szlachtą, właścicielami miasta, młynarzami czy biedotą miejską. Analiza Sieci Społecznościowej prócz zalet posiada również wady. Przede wszystkim należy pamiętać, że zrekonstruowana sieć jest tylko subiektywnym fragmentem pewnej przeszłej rzeczywistości opartej na indukcji i dedukcji. Aby taki konstrukt można było zwizualizować, wymagane jest odpowiednie oprogramowanie. W niniejszej pracy badawczej zostanie wykorzystany program Gephi 0.10[10].

Celem artykułu jest opisanie praktycznego podejścia do wykorzystania metody SNA w rekonstrukcji sieci społeczno-towarzyskiej o charakterze skierowanym. Po krótkim wprowadzeniu zostaną podjęte kwestie związku małżeńskiego w prawie kanonicznym i w tradycji świeckiej. Po zapoznaniu się z głównymi pojęciami metody SNA (sieć społeczna, węzeł, relacja skierowana, relacja nieskierowana) zostanie przedstawiony koncept ich zastosowania w rekonstrukcji sieci. Forma przedstawienia konceptu etapami na przykładach modeli ma na celu w sposób plastyczny zwrócić uwagę na kluczową rolę relacji w sieciach. Na końcu artykułu zamieszczono przykład sieci społecznej parafii żareckiej obejmujących lata 1718–1720. Motywacją napisania artykułu jest chęć spopularyzowania metody SNA do badań demograficzno-historycznych.

Geneza metody analizy sieci społecznościowej

Lista twórców, autorów i badaczy, którzy przyczynili się do rozwoju analizy sieci społecznościowej (SNA), jest długa. Przytoczone przykłady mają charakter subiektywny, jak również odzwierciedlają koncept artykułu. Georg Simmel opublikował w roku 1908 pracę pod tytułem „Die quantitative Bestimmtheit der Gruppe".

[9] Wiek ten jest obliczany na podstawie metryk ochrzczonych.

[10] Poza tym można korzystać z: UCINET, R, SIENA, Pnet, Pajek czy NodeXL. Powyższy artykuł koncentruje się na teoretycznej możliwości opracowania struktury społecznej bez szczegółowego omówienia oprogramowania Gephi.

Przedstawił w niej badania nad zmiennymi interakcjami między indywiduum a kręgami społecznymi/grupami. Stwierdził, że diada to najmniejszy element (dwa indywidua i połączenie między nimi) takiej społeczności, gdzie istnieją już zmienne relacje (lubię go albo go nie lubię; znam go albo go nie znam; syn–ojciec albo ojciec–syn itd.). Gdy natomiast rozszerzymy strukturę o kolejne indywiduum, powstaje triada. Trzecia osoba, która wchodzi do grupy, może konflikty łagodzić albo je zaostrzać, tym samym wyzwala nowe mechanizmy zachowania. W historycznej rekonstrukcji autor ten uważany jest za pioniera i jednego z twórców Analizy Sieci Społecznościowej[11].

Jakub Moreno przyczynił się do rozwoju SNA, wprowadzając jako pierwszy graficzne wykresy, nazywając je socjogramami, a metodę, dzięki której mierzył społeczne relacje – socjometrią (*Who shall survive* – 1934)[12]. Pojęcie „struktura socjalna" w kontekście sieci zostało po raz pierwszy użyte przez socjologa i antropologa Alfreda R. Radcliffe-Browna w roku 1940[13]. John A. Barnes, po czternastomiesięcznych badaniach społeczności w Bremnes, sformułował w swojej pracy *Class and Commitees in a Norwegian Island Parish* (1954) pojęcie sieci. Wyobrażał ją sobie jako zbiór punktów połączonych liniami. Punkty mogą przedstawiać osoby albo grupy, natomiast linie nakreślają interakcję między nimi[14].

Lata sześćdziesiąte i siedemdziesiąte XX wieku to rozwój teorii grafów[15] oraz informatyki, co zainicjowało pozytywne impulsy do dalszego rozwoju metod w teorii Analizy Sieci Społecznościowych. Jeszcze pod koniec XX wieku SNA nie była zbyt szeroko wykorzystywana przez badaczy w innych naukach poza socjologią i dyscyplinami pokrewnymi. Natomiast XXI wiek zostaje już określany jako epoka sieci dla podkreślenia, że wszystko, co nas otacza, jest ze sobą powiązane. Rozwijająca się komputeryzacja (i dla jej potrzeb technika) pozwala analizować coraz większe ilości danych, co wpływa pozytywnie na rosnące zainteresowanie metodą SNA dla różnych projektów badawczych.[16]

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[11] Boris Holzer i Christian Stegbauer, red., *Schlüsselwerke der Netzwerkforschung* (Springer VS, 2019), 507–514; Jan Ahrendt Fuhse, *Soziale Netzwerke. Konzepte und Forschungsmethoden* (UVK Verlag, 2016), 30–33; Dorothea Jansen, *Einführung in die Netzwerkanalyse: Grundlagen, Methoden, Forschungsbeispiele* (Verlag für Sozialwissenschaften, 2006), 37.

[12] Holzer i Stegbauer, *Schlüsselwerke*, 425–28; Fuhse, *Soziale Netzwerke*, 35–36, Jansen, *Einführung*, 40.

[13] Fuhse, *Soziale Netzwerke*, 48; Holzer i Stegbauer, *Schlüsselwerke*, 481–84; Jansen, *Einführung*, 43.

[14] Holzer i Stegbauer, *Schlüsselwerke*, 31–34; Fuhse, *Soziale Netzwerke*, 50.

[15] Jansen, *Einführung*, 40.

[16] Alexis Pister i in., „From Historical Documents To Social Network Visualization: Potential Pitfalls and Network Modeling", w *VIS4DH 2022 – 7th Workshop on Visualization for the Digital Humanities* (Oklahoma, 2022), https://inria.hal.science/hal-03784532; Charles Wetherell, „Historical Social Network Analysis", *International Review of Social History* 43, nr S6 (1998): 125–44,

Wykorzystanie metody SNA – stan badań

Cezary Kuklo w roku 2020 zwrócił uwagę „na potrzebę stosowania nowych metod badawczych w warsztacie historyka, jak np. metody analizy sieci społecznych (Social Network Analysis – SNA)”[17]. Największy dorobek w wykorzystaniu instrumentów metody SNA ma Jerzy Marek Minakowski[18]. Dorota Gregorowicz, pisząca recenzję do książki Michała Salamonika *Mieszczańska kariera w szlacheckiej Rzeczypospolitej? Francesco De Gratta i jego social network*, ustosunkowała się do metody „ego-sieci”, którą autor wybrał dla lepszego scharakteryzowania głównego bohatera[19]. Kontekst sieciowy, metodą SNA, do przedstawienia głównych kierunków badawczych profesora Edwarda Włodarczyka został wykorzystany w artykule „Działalność naukowa profesora Edwarda Włodarczyka w świetle publikacji autorskich (1973–2020)”[20]. Dariusz Chojecki i Radosław Gaziński stworzyli sieć społeczno-rodzinną hugenotów mieszkających pod koniec XVIII wieku

https://doi.org/10.1017/S0020859000115123; Emily Buchnea i Ziad Elsahn, „Historical Social Network Analysis: Advancing New Directions”, *International Business Review* 31, nr 5 (2022): 101990, https://doi.org/10.1016/j.ibusrev.2022.101990; Barbara Dörpinghaus i Hans-Georg Wünch, „Relationships and Forms in the Social Network of the Jacob Narrative: A Narratological Perspective”, *Old Testament Essays* 36, nr 2 (2023): 347–67, https://doi.org/10.17159/23123621/2023/v36n2a4; Roman Deiksler, „Social Network Analysis in the Study of the Works of Josephus. The Case Study of Calilee during the First Jewish Revolt”, *Folia Praehistorica Posnaniensia* 24 (2019): 35–46, https://doi.org/10.14746/fpp.2019.24.02; Maria Korybut-Marciniak, „Potencjał analizy sieci społecznych w badaniach egodokumentów”, *Rocznik Antropologii Historii* 13 (2020): 257–73, https://doi.org/10.25945/RAH.2020.13.011; Wojciech Stachyra, „Użyteczność badawcza struktur sieciowych w nauce o stosunkach międzynarodowych”, *Athenaeum Polskie Studia Politologiczne* 70, nr 2 (2021): 159–74, https://doi.org/10.15804/athena.2021.70.10; Elvina Stein, Gustavo Fernandez Riva, *Networks of Manuscripts, Network of Texts*, Special Issue of *Journal of Historical Network Research* 9 (2023), https://doi.org/10.25517/JHNR.V9I.

[17] Cezary Kuklo, „Badania nad historią kobiet w Polsce XVI–XVIII wieku w latach 2011–2020. Niezmienna atrakcyjność, ale czy nowe pytania?”, *Acta Universitatis Lodziensis. Folia Historica* 107 (2020): 14, https://doi.org/10.18778/0208-6050.107.02.

[18] Marek Jerzy Minakowski, „Social Network around *Kurier Warszawski* Based on Its Obituaries of the Years 1821–1861”, *Przeszłość Demograficzna Polski* 39 (2017): 209–251, https://doi.org/10.18276/pdp.2017.39-09; tenże, „House of Networks: The Polish-Lithuanian Senate (1569–1795) as Parliamentary Representation of the National Social Network (of Women?)”, *Przeszłość Demograficzna Polski* 41 (2019): 33–56, https://doi.org/10.18276/pdp.2019.41-02; tenże, „Family Network of Emerging Jewish Intelligentsia (Cracow 1850–1918)”, *Journal of Historical Network Research* 2 (2018): 53–75.

[19] Dorota Gregorowicz, „Mieszczańska kariera w szlacheckiej Rzeczypospolitej? Francesco De Gratta i jego social network”, *Zapiski Historyczne* 87, nr 2 (2022): 133–149, https://doi.org/10.15762/ZH.2022.17.

[20] Dariusz K. Chojecki, „Działalność naukowa profesora Edwarda Włodarczyka w świetle publikacji autorskich (1973–2020). Kontekst ilościowy”, *Zapiski Historyczne* 87, nr 1 (2022): 107–132, https://doi.org/10.15762/ZH.2022.05.

w Szczecinie z wykorzystaniem ksiąg chrztów. Skonstruowana przez nich sieć powiązań ma charakter nieskierowany[21].

Wykorzystanie ksiąg zaślubionych do tworzenia sieci społeczno-towarzyskiej przy pomocy narzędzi analizy sieci społecznościowych wykorzystuje się jednak rzadko w badaniach demograficznych. Aleksandra Dul w artykule „Życie towarzyskie dziewiętnastowiecznej wiejskiej parafii. Analiza sieci społecznych"[22] tworzy obraz sieci towarzyskiej XIX-wiecznej społeczności, na podstawie której podjęła próbę charakteryzacji mieszkańców parafii Iwanowice. Zbudowana przez nią sieć ma postać tak zwanego grafu skierowanego, dzięki czemu wszystkie relacje zachowały swoje informacje w połączeniach.

Główne pojęcia związane z analizą sieci społecznościowej

Teoria grafów zaadaptowana na potrzeby analizy sieci społecznościowej wywarła wpływ na kształtowanie się jej terminologii. Te nowe dyscypliny rozwijały się przede wszystkim w kulturze anglojęzycznej[23]. Z tego powodu poniżej zostały zacytowane definicje grafu, sieci oraz sieci społecznej z literatury anglojęzycznej w oryginale i w języku polskim.

> Graf:
> *A graph G consists of a non-empty finite set V(G) of elements called vertices, and a finite family E(G) of unordered pairs of (not necessarily distinct) elements of V(G) call edges; the use of the word „family" permits the existence of multiple edges. We call V(G) the vertex set and E(G) the edge family of G*[24].
> „Graf G składa się z niepustego skończonego zbioru V(G) elementów zwanych wierzchołkami oraz skończonej rodziny E(G) nieuporządkowanych par (niekoniecznie różnych) elementów V(G) zwanych krawędziami; użycie słowa «rodzina» pozwala na istnienie wielu krawędzi. Nazywamy więc V(G) zbiorem wierzchołków, a E(G) rodziną krawędzi G".

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[21] Dariusz K. Chojecki i Radosław Gaziński, „Le réseau de sociabilité des huguenots dans le Szczecin prussien au début du XVIII siècle à la lumière des données sur les baptêmes", *Annales de Démographie Historique* 147, no. 2 (2024) [w druku].

[22] Aleksandra Dul, „Życie towarzyskie dziewiętnastowiecznej wiejskiej parafii. Analiza sieci społecznych", *Przeszłość Demograficzna Polski* 39 (2017): 167–208, https://doi.org/10.18276/pdp.2017.39-08.

[23] Do znanych ośrodków, w których pracowali liczni naukowcy, należą: Massachusetts Institute of Technology (MIT), University of Michigan, University of Harvard czy University of Cambridge.

[24] Robin J. Wilson, *Introduction to Graph Theory* (Prentice Hall, 2009), 9.

Sieć:
A network is, in its simplest form, a collection of point joined together in pairs by lines. In the nomenclature of the field a point is referred to as a node or vertex and a line is referred to as an edge[25].
„Sieć to, w najprostszej formie, zbiór punktów połączonych ze sobą parami za pomocą linii. W nomenklaturze tej dziedziny punkt jest określany jako węzeł lub wierzchołek, a linia jest określana jako krawędź".

Sieć społeczna:
A social network is a structure composed of a set of entities, some of whose members are connected by a set of one or more relations[26].
„Sieć społeczna to struktura składająca się ze zbioru podmiotów, których niektórzy członkowie są połączeni zbiorem jednej lub więcej relacji".
A social network consists of a set nodes (sometimes referred to as actors or vertices in graph theory) connected via some type of relations, which are also called ties, links, arcs, or edges[27].
„Sieć społeczna składa się ze zbioru węzłów (czasami nazywanych aktorami lub wierzchołkami w teorii grafów) połączonych za pomocą pewnego rodzaju relacji, które są również nazywane więzami, linkami, łukami lub krawędziami".

Celem powyższego zestawienia jest ukazanie podobieństw i różnic cytowanych pojęć. Wszystkie trzy definicje mówią o dwóch zbiorach, gdzie dla grafów są to abstrakcyjne elementy, dla sieci zbiory punktów i linii, a dla sieci społecznej zbiory węzłów (które mogą być nazywane aktorami) i relacji (relacje znajomości, relacje hierarchii, relacje kontaktów itp.). Ponieważ teoria grafów jest niejako podstawą powyższych definicji, poniżej zostały przedstawione jej kluczowe pojęcia, które również wykorzystuje się w SNA.

Matematyczna forma zapisu grafu brzmi:

$$G[raph] = (V[ertices], E[dge])^{28} \quad (1)$$

Mówi ona, że graf składa się z dwóch zbiorów: wierzchołków i krawędzi, przy czym zbiór wierzchołków jest zbiorem niepustym, natomiast zbiór krawędzi może być zbiorem pustym. Poza tym jeden element ze zbioru krawędzi łączy minimum dwa elementy ze zbioru wierzchołka[29].

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[25] Mark E.J. Newman, *Networks*, wyd. 2 (Oxford University Press, 2018), 1.

[26] David Knoke i Song Yang, *Social Network Analysis* (Sage Publication, 2020), 12.

[27] Song Yang i in., *Social Network Analysis: Methods and Examples* (Sage Publication, 2017), 5.

[28] Więcej na ten temat – patrz Aneks.

[29] John Clark i Derek Allan Holton, *Graphentheorie: Grundlagen und Anwendungen* (Spektrum, 1994); Peter Tittmann, *Graphentheorie: eine anwendungsorientierte Einführung* (Hanser Verlag, 2011); i chociażby Wilson, *Introduction*.

W zależności od kierunku krawędzi mowa jest o grafie skierowanym lub nieskierowanym[30]. Graf skierowany definiuje krawędź skierowaną (strzałka, łuk), która łączy uporządkowaną parę wierzchołków, przy czym jeden będzie nazywany wierzchołkiem początkowym (wychodzącym), a drugi końcowym (przychodzącym). Graf nieskierowany charakteryzuje krawędź nieskierowaną (linia), która łączy uporządkowaną parę wierzchołków, przy czym każdy z nich może być wierzchołkiem początkowym i końcowym[31].

Ten matematyczny świat został wykorzystany na potrzeby badań społecznych. W analizie sieci społecznościowej, sieć społeczna, czyli graf jako struktura sieciowa, definiowana jest jako zbiór węzłów połączonych różnymi rodzajami relacji[32]. Węzły, w zależności od postawionego sobie pytania badawczego, mogą reprezentować osoby, grupy, instytucje, organizacje czy jakikolwiek dowolny obiekt badawczy. Najczęściej używanym określeniem w analizie sieci społecznościowej dla węzła jest „aktor"[33], a dla krawędzi „relacja"[34]. Ten świat sieci jest bardzo zróżnicowany i on sam może dzielić się na jeszcze inne mniejsze komponenty sieciowe, które zostaną poddane dalszym analizom. Nie ma jednej sieci.

W związku z terminologią analizy sieci społecznościowej trzeba podkreślić jeszcze jeden aspekt – opierając się na teorii grafów, która nie jest standardowa, każdy matematyk używa swoich własnych definicji[35]. W dalszej części artykułu będzie używana następująca notacja dla opisanych głównych pojęć analizy sieci społecznościowej:

– dla określenia powiązań/relacji nieskierowanej

$$E = \{\{a,b\},\{c,d\}\}$$

gdzie litera E jest pierwszą literą angielskiego słowa *edge* – krawędź. Elementy relacji nieskierowanej będą zapisywane w nawiasach klamrowych {a,b},{c,d},

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[30] Jacek M. Wojciechowski i Krzysztof Pieńkosz, *Grafy i sieci* (Wydawnictwo Naukowe PWN, 2013), 1. Autorzy używają terminów: graf niezorientowany dla grafu nieskierowanego i graf zorientowany dla grafu skierowanego.

[31] W formie tabelarycznej zostały ujęte informacje na temat grafu skierowanego i nieskierowanego – patrz aneks.

[32] Yang i in., *Social Network*, 12; Knoke i Yang, *Social Network*, 5.

[33] Użycie słowa „aktor" w sieci społecznej często prowadzi do nieporozumień, zwłaszcza gdy bada się relacje między firmami, przedsiębiorstwami, spółkami czy organizacjami. W tym wypadku aktor nie musi być osobą; Newman, *Networks*, 106.

[34] Wszystkich zainteresowanych odsyłam do artykułu Radosława Sierockiego, „Analiza sieci społecznych jako metoda badawcza w socjologii", *Rocznik Antropologii Historii* 13 (2020): 223–55, https://doi.org/10.25945/RAH2020.13.009.

[35] „The language of graph theory is not standard – all authors have their own terminology (…). Any such definition is perfectly valid, provided that it is used consistently", Wilson, *Introduction*, 9 („Pojęcie grafu jest dość intuicyjne i być może z tego powodu w różnych podręcznikach spotykamy nieco różniące się definicje" – Wojciechowski i Pieńkosz, *Grafy*, 1).

co ma również oznaczać, że nie ma ani węzła początkowego, ani końcowego. Informacja przepływa z **a** do **b** i odwrotnie z **b** do **a**;
– dla określenia powiązań/relacji skierowanej

$$A = \{(a,b), (b,a)\}$$

gdzie litera A jest pierwszą literą angielskiego słowa *arc* – łuk. Elementy powiązań skierowanych będą zapisywane w nawiasach okrągłych (a,b) co oznacza, że **a** łączy się z **b**. Poza tym wiadomo, że **a** jest węzłem początkowym, a **b** jest węzłem końcowym;
– dla określenia węzłów/aktorów

$$V = \{a,b,c,d\}$$

gdzie litera V jest pierwszą literą angielskiego słowa *vertex* – wierzchołek. Elementy zbioru będą zapisywane w nawiasach klamrowych[36].

Akt małżeństwa w prawie kanonicznym a w tradycji świeckiej

Forma zawierania małżeństw została uchwalona 11 listopada 1563 roku na 24 sesji soboru trydenckiego i uzupełniona w *Rituale Romanum* z roku 1614 przez papieża Pawła V[37]. Rozporządzenia kościelne z jednej strony miały położyć kres zawieraniu tzw. małżeństw tajnych, a z drugiej strony akt małżeński został poddany kościelnej jurysdykcji. Prawo kanoniczne uważało małżeństwo za ważne, jeżeli nupturienci wyrazili swoją nieprzymuszoną wolną wolę zawarcia związku małżeńskiego wobec „właściwego plebana i dwóch, względnie trzech świadków”[38]. Pleban właściwy to duchowny pochodzący z parafii, z której pochodzą oblubieńcy. W przypadku dwóch różnych parafii ślubu powinien udzielać proboszcz z parafii panny młodej. Jeżeli narzeczeni nie mają stałego miejsca zamieszkania,

[36] Więcej informacji w aneksie. Poza tym odsyłam do pracy: André Krischke i Helge Röpcke, *Graphen und Netzwerktheorie: Grundlagen, Methoden, Anwendungen* (Hanser, 2024), 128.

[37] Władysław Abraham, *Forma zawarcia zaręczyn i małżeństwa w najnowszem ustawodawstwie kościelnem* (Lwów, 1913): 25–27; tamże, 27: „Prawo trydenckie stworzyło podstawę obowiązującego odtąd prawa kościelnego, ustawodawstwo późniejsze, aż do czasów najnowszych, wyjaśniało tylko lub uzupełniało przepisy soboru”; Cezary Kuklo, *Demografia Rzeczypospolitej przedrozbiorowej* (Wydawnictwo DiG, 2009), 272; Radosław Kotecki, „Rejestracja metrykalna wiernych w świetle potrydenckiego ustawodawstwa Kościoła katolickiego”, *Nasza Przeszłość* 112 (2009): 7; Bolesław Kumor, „Metryki parafialne w archiwach diecezjalnych”, *Kwartalnik Historii Kultury Materialnej* 14, nr 1 (1966): 65–66; Marion Lischka, *Liebe als Ritual: Eheanbahnung und Brautwerbung in der frühneuzeitlichen Grafschaft Lippe* (F. Schöningh, 2006), 51.

[38] Juliusz Bardach, Bogusław Leśnodorski i Michał Pietrzak, *Historia państwa i prawa polskiego* (PWN, 1987), 229; podobne sformułowanie można znaleźć w pracy: Abraham, *Forma*, 30.

właściwym plebanem jest duchowny z parafii, w której aktualnie przebywają. Co więcej, jurysdykcja kościelna definiuje rolę plebana jako świadka urzędowego, ale podkreśla jego świadome uczestnictwo w tej ceremonii – „przy użyciu rozumu i zupełnej przytomności”[39]. Dla ważności małżeństwa oprócz obecności kapłana wymagana była jeszcze obecność – minimum – dwóch świadków[40]. Osoby świadkujące „mają być przy używaniu rozumu i zdrowych zmysłach”[41]. Formalnie mogły spełniać tę rolę osoby niedojrzałe, wyjęte spod prawa, krewni, rodzice, kobiety czy heretycy; nie wymagano nawet od nich znajomości nupturientów[42]. Poza tym prawo kanoniczne reguluje formę zapowiedzi przedmałżeńskich oraz ewentualnych przeszkód stojących na drodze nupturientów[43]. Dekret Soboru Trydenckiego „Tametsi” nie tylko normuje prawo małżeńskie, ale również zobowiązuje każdego proboszcza do niezwłocznego odnotowania tego zdarzenia w księgach zaślubionych (Libri copulatorum) i do przechowywania tychże[44]. Cytując za Bolesławem Kumorem, forma wpisu do księgi brzmiała: „Rok (…), miesiąc (…) dnia (…), ja N. proboszcz (lub wikariusz) kościoła parafialnego w N. potwierdziłem (confirmavi) związek małżeński zawarty między N i N. w tymże kościele parafialnym w obecności N. i N. i wielu innych obecnych po uprzednim wygłoszeniu zwyczajnych zapowiedzi”[45]. Księgi zaślubionych XVIII-wiecznej żareckiej parafii spełniają podstawowe wymogi wpisów – może tylko zamiast „confirmavi” pisano „benedixit/benedixi” i „ratificavit/ratificavi”.

Maria Żmijewska pisze, że „ślub i obrzędy z nim związane były najważniejszym wydarzeniem w życiu osobistym ludności (...). Towarzyszyły mu pieczołowicie pielęgnowane wielowiekowe tradycje”[46]. Do wielowiekowej tradycji zalicza się zaręczyny,

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[39] Józef Pelczar, *Prawo małżeńskie katolickie z uwzględnieniem prawa cywilnego obowiązującego w Austryi, w Prusach i w Królestwie Polskiem*, wyd. 2 (Drukarnia Uniwersytetu Jagiellońskiego, 1885), 307–313; Abraham, *Forma*, 30–32.

[40] Abraham, *Forma*, 32.

[41] Pelczar, *Prawo*, 316.

[42] Pelczar, *Prawo*, 316; Anna Tunia, „Kształtowanie się kanonicznej formy zawarcia małżeństwa”, *Roczniki Nauk Prawnych* 18, nr 1 (2008): 135; Abraham, *Forma*, 32.

[43] Abraham, *Forma*, 27–29; Pelczar, *Prawo*, 329–37.

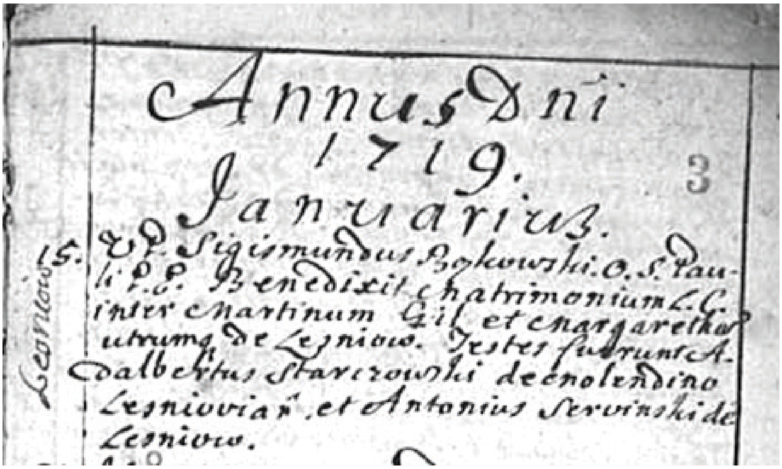
[44] Józef Kurpas, „Początki ksiąg metrykalnych”, *Archiwa, Biblioteki i Muzea Kościelne* 2, nr 1–2 (1961): 22; Bartosz Małłek, „Księgi metrykalne parafii rzymskokatolickiej w Sypniewie k. Więcborka z lat 1730–1874: stan zachowania i możliwość odtworzenia ruchu naturalnego ludności”, *Zasoby Biblioteki Głównej UMCS* (2018): 264, http://dlibra.umcs.lublin.pl/dlibra/publication/39414/edition/36157; Kuklo, *Demografia*, 92; Kumor, *Metryki*, 67.

[45] Kumor, *Metryki*, 67.

[46] Małgorzata Żmijewska, *Ludność parafii tyskiej od 1749 roku do połowy XIX wieku w świetle ksiąg metrykalnych: studium demograficzno-społeczne* (praca doktorska napisana pod kierunkiem prof. dra hab. Antoniego Barciaka, Uniwersytet Śląski, Wydział Nauk Społecznych, 2008), 107.

o których w dekrecie „Tametsi" nie było żadnej wzmianki[47]. Za pośrednictwem dziewosłębów czy swatów po skojarzeniu małżeństw, które odbywało się szybko, dochodziło do zaręczyn zwanych też zmówinami czy zrękowinami. W okolicach Żarek odbywały się one w czwartek późnym wieczorem, gdzie wchodzący do domu przyszłej panny młodej swat wołał: „cy nie macie jałowicy na sprzedaj?"[48]. Przy mniejszej lub większej biesiadzie dochodziło w gronie rodzinnym do umowy przedślubnej, która określała osobiste i majątkowe stosunki przyszłych małżonków oraz wysokość wiana. Ustalenie wielkości wiana jest uważane „za relikt pogańskiego zwyczaju zawierania małżeństwa drogą kupna"[49]. Przy zaręczynach, przy wzajemnym przyrzeczeniu przyszłego małżeństwa, dochodziło do wymiany wieńców. Akt zaręczyn miał w okresie przedtrydenckim większe znaczenie w tradycji ludowej niż sam akt ślubu, który był naturalną konsekwencją zaręczyn, umową między dwoma stronami i w momencie, kiedy dochodził do skutku, udawano się na plebanię, aby dać na zapowiedzi[50].

Ilustracja 1. Z metryk zaślubionych parafii żareckiej z 1719 roku



Źródło: https://www.familysearch.org, dostęp 24.08.2024.

[47] Abraham, *Forma*, 26.

[48] Michał Fedorowski, *Lud okolic Żarek, Siewierza i Pilicy. Jego zwyczaje, sposób życia, obrzędy, podania, gusła, zabobony, pieśni, zabawy, przysłowia, zagadki i właściwości mowy*, t. 1 (Księgarnia M. Arcta, 1888), 35. Tradycje weselne tych okolic były bardziej rozbudowane, nie kończyło się tylko na zmówinach.

[49] Andrzej Chwalba, *Obyczaje w Polsce. Od średniowiecza do czasów współczesnych* (Wydawnictwo Naukowe PWN, 2015), 36.

[50] Abraham, *Forma*, 10–11; Przemysław Dąbkowski, *Zarys prawa polskiego prywatnego: podręcznik do nauki uniwersyteckiej* (K.S. Jakubowski, 1921), 95.

„Wedle starego obyczaju, młodzian pospołu z dziewczyną spraszają”[51] świadków i gości na ślub. Cytat pokazuje, że para nowożeńców inicjowała interakcje. Ta informacja jest istotna dla procesu odtwarzania sieci skierowanej.

Koncept zastosowania metody analizy sieci społecznościowej w rekonstrukcji sieci społeczno-towarzyskiej

Pierwszy etap – definicja węzłów i relacji

Z ksiąg zaślubionych parafii żareckiej można wyodrębnić trzy rodzaje węzłów: duchowieństwo, oblubieńców i świadków (tzw. świadkowie zwykli). Duchowieństwo ze względu na swoją rolę z urzędu zostaje wykluczone, gdyż celem odtworzenia sieci jest przebadanie stosunków między mieszkańcami parafii żareckiej[52]. Pozostają dwa typy węzłów: nupturienci i świadkowie zwykli. W formie graficznej zostają oni przedstawieni jako okręgi (rys. 1).

Rysunek 1. Główni aktorzy nupturienci i świadkowie

Notacja w okręgach oznacza: **N** – nupturient/nupturientka (z łac.: *nupturient* – narzeczony, oblubieniec, oblubienica)[53]; **T** – świadek (z łac.: *testis* – świadek)[54]. Dodatkowo, dla lepszego rozróżnienia otoku, zostały wprowadzone kolory: **N** – kolor niebieski, **T** – kolor zielony (rys. 1). Przyglądając się bliżej elementom **N**, niejako odruchowo nasuwa się podział na dwa kolejne zbiory: męski i żeński (rys. 2).

Rysunek 2. Główni aktorzy – nupturient, nupturientka i świadek

[51] Fedorowski, *Lud*, 37. Zamieszczone w pracy opisy zwyczajów związanych ze spraszaniem gości pokazują, że były to bardzo rozbudowane i intensywne ceremonie.

[52] Informacje na temat plebanów, którzy asystowali przy akcie zaślubin, będzie można ująć przy tworzeniu bazy danych relacji.

[53] Janusz Sondel, *Słownik łacińsko-polski dla prawników i historyków* (Universitas, 2009), 669.

[54] Sondel, *Słownik*, 942.

Oczywiście wpływa to na zmianę notacji węzłów, gdzie $\mathbf{N_{M1}}$ oznacza: **N** – oblubieniec, **M** – mężczyzna (łac. *masculus*); analogicznie do $\mathbf{N_{F1}}$: **N** – oblubienica, **F** – kobieta (łac. *femina*); w obu wypadkach cyfra **1** symbolicznie przedstawia liczbę porządkową. Równocześnie typ węzła **T** rozszerzono o liczbę porządkową.

Ustalenie relacji małżeńskiej między węzłami oblubieńca i oblubienicy wygląda następująco: nupturient $\mathbf{N_{M1}}$ (mężczyzna) jest jedną stroną umowy, a $\mathbf{N_{F1}}$ (kobieta) jest drugą stroną umowy (patrz rys. 3). Stojąc na ślubnym kobiercu, wyrażają obustronną wolę zawarcia związku małżeńskiego. Przebiega on według schematu: $\mathbf{N_{M1}}$ formułuje wiadomości w kierunku $\mathbf{N_{F1}}$ jednocześnie $\mathbf{N_{F1}}$ formułuje wiadomości w kierunku $\mathbf{N_{M1}}$, zatem obustronnie dochodzi do interakcji (rys. 3).

Rysunek 3. Relacja małżeńska

Z punktu widzenia sieci społecznościowej Dorothea Jansen objaśnia związek skierowany, tudzież nieskierowany, następująco: jeżeli **A** jest synem **B**, to **B** nie może być jednocześnie ojcem **A**. Jest to relacja skierowana. Jeśli natomiast przyjrzymy się relacji pokrewieństwa, jest ona relacją nieskierowaną, bowiem jeżeli **A** jest spokrewniona z **B**, to **B** jest spokrewniony z **A**. Wszystkie relacje oparte na wspólnym członkostwie mają charakter nieskierowany[55].

Oblubieńcy nie są jeszcze na etapie powinowactwa, gdyż dopiero zakładają komórkę rodzinną. Dyspensy z racji pokrewieństwa między nupturientami występują w księgach zaślubionych. Ale przy tworzeniu tej relacji pytanie nie brzmi, czy $\mathbf{N_{M1}}$ jest krewnym $\mathbf{N_{F1}}$, tylko czy $\mathbf{N_{M1}}$ bierze sobie za żonę $\mathbf{N_{F1}}$ i czy $\mathbf{N_{F1}}$ bierze sobie za męża $\mathbf{N_{M1}}$. Z racji tego tworzy się relacja skierowana, obustronna – mutual[56], co literatura przedmiotu nazywa również „wzajemnością powiązań”[57].

---

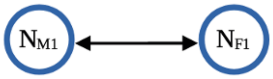
[55] „(…), ob die Beziehung gerichtet ist oder nicht. Eine Abstammungsbeziehung ist z.B. gerichtet. Sie kann auch gar nicht symmetrisch sein: wenn A der Sohn von B ist, kann B nicht gleichzeitig der Sohn von A sein. Untersucht man stattdessen die Verwandtschaftsbeziehungen zwischen A und B, so ist die Beziehung ungerichtet: wenn A mit B verwandt ist, so ist auch B mit A verwandt. Alle Relationen, die auf gemeinsamen Mitgliedschaften beruhen, sind ungerichteter Natur.“ Cytat według Jansen, *Einführung*, 73.

[56] Jansen, *Einführung*, 61.

[57] Yang i in., *Social Network*, 10. Jansen, *Einführung*, 61.

W tworzonych grafach według analizy sieci społecznej obustronne łącze będzie przedstawiane jako dwukierunkowa strzałka (rys. 4).

Rysunek 4. Relacja małżeńska – dwukierunkowa strzałka



Otrzymana forma grafu jest nazywana w literaturze przedmiotu diadą[58] – jest to najmniejszy konstrukt w teorii grafów oraz strukturze sieci społecznościowej (dwa punkty i relacja/relacje między nimi).
Notacja rysunku 4.:

$$V = \{N_{M1}, N_{F1}\} \tag{2}$$

$$A = \{(N_{M1}, N_{F1}), (N_{F1}, N_{M1})\} \tag{3}$$

Poniższy rysunek wizualizuje trzy możliwości ewentualnych powiązań dla ustalenia relacji świadkowania między $\mathbf{N_{M1}}$ (oblubieńcem) a $\mathbf{T_1}$ (świadkiem zwykłym); dwie relacje skierowane z $\mathbf{N_{M1}}$ w kierunku $\mathbf{T_1}$ i z $\mathbf{T_1}$ w kierunku $\mathbf{N_{M1}}$ oraz jedną relację nieskierowaną $\mathbf{N_{M1}}$ w kierunku $\mathbf{T_1}$ i z $\mathbf{T_1}$ w kierunku $\mathbf{N_{M1}}$.

Rysunek 5. Relacja między nupturientem a świadkiem
albo między świadkiem a nupturientem

Z tradycji ludowej wiadomo, że para młoda spraszała świadków i gości na ślub. Otrzymujemy zatem relację skierowaną: $\mathbf{N_{M1}}$ i $\mathbf{N_{F1}}$ proszą $\mathbf{T_1}$ na świadka (rys. 6), gdzie nupturienci będą węzłami początkowymi (sender), a świadek/świadkowie będą węzłami końcowymi (receiver) przepływu informacji[59].

[58] Yang i in., *Social Network*, 10; Jansen, *Einführung*, 61.
[59] Yang i in., *Social Network*, 10.

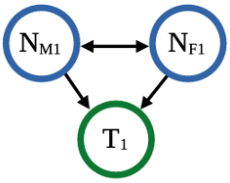
Rysunek 6. Relacja świadkowania między nuptrientem a świadkiem – diada

Z połączenia trzech zdefiniowanych podstawowych elementów ($\mathbf{N_{M1}}$, $\mathbf{N_{F1}}$, $\mathbf{T_1}$) tworzy się triadę (rys. 7).
Notacja rysunku 7.:

$$V = \{N_{M1}, N_{F1}, T_1\} \tag{4}$$

$$A = \{(N_{\mathbf{M1}}, N_{\mathbf{F1}}), (N_{\mathbf{F1}}, N_{\mathbf{M1}}), (N_{M1}, T_1), (N_{F1}, T_1)\} \tag{5}$$

Rysunek 7. Relacje między nupturientami a świadkiem – triada



Z czego relacja małżeńska jest symetryczna, dwustronna, wzajemna, a relacja świadkowania jednostronna, asymetryczna. Powstały układ ma charakter przechodni (transitiv) – wszystkie elementy zostały ze sobą połączone i utworzyły triadę[60].

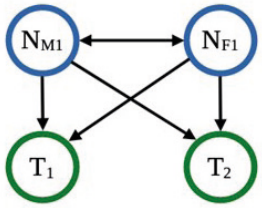
Drugi etap – tworzenie modeli i scenariuszy

Scenariusz numer 1 – schemat 1

Po zdefiniowaniu rodzajów węzłów, a także relacji w XVIII-wiecznej sieci społecznościowej, wyłonił się pierwszy schemat bazujący na standardowym zapisie aktu ślubu: na ślubnym kobiercu staje pan młody i panna młoda w asyście dwóch świadków.

[60] Jansen, *Einführung*, 62–64; Knoke i Yang, *Social Network*, 72–76; Yang i in., *Social Network*, 15.

Schemat 1



Notacja:

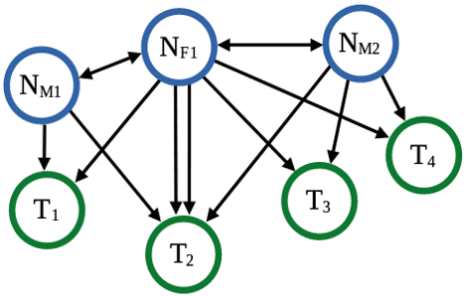
$$V = \{N_{M1}, N_{F1}, T_1, T_2\} \quad (6)$$

$$A = \{(N_{M1}, N_{F1}), (N_{F1}, N_{M1}), (N_{M1}, T_1), (N_{F1}, T_1), (N_{M1}, T_2), (N_{F1}, T_2)\} \quad (7)$$

Scenariusz numer 2 – schemat 2

Scenariusz: pan młody – kawaler ($\mathbf{N_{M1}}$) i panna młoda – panna ($\mathbf{N_{F1}}$) stoją na ślubnym kobiercu, i na świadków poproszono dwie osoby ($\mathbf{T_1}$, $\mathbf{T_2}$). Pożycie małżeńskie kończy się po dwóch latach – z przyczyny śmierci małżonka. Nowo upieczona wdowa po dwóch miesiącach staje ponownie na ślubnym kobiercu. Czyli panna młoda – wdowa ($\mathbf{N_{F1}}$) zawiera nowy związek małżeński z panem młodym – kawalerem ($\mathbf{N_{M2}}$). Przy ponownej ceremonii zaślubin liczba świadków wzrosła z dwóch do trzech ($\mathbf{T_2}$, $\mathbf{T_3}$, $\mathbf{T_4}$) – schemat 2.

Schemat 2



Notacja:

$$V = \{N_{M1}, N_{F1}, N_{M2}, T_1, T_2, T_3, T_4\} \tag{8}$$

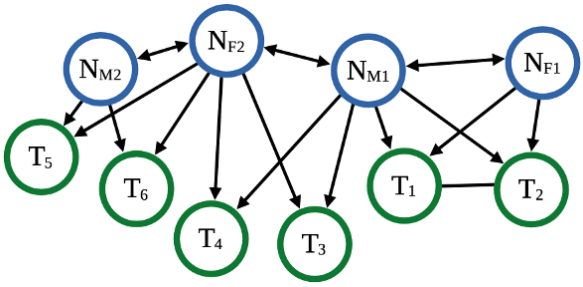
$$A = \{(N_{M1}, N_{F1}), (N_{F1}, N_{M1}), (N_{M1}, T_1), (N_{F1}, T_1), (N_{M1}, T_2), (N_{F1}, T_2), (N_{F1}, N_{M2}), (N_{M2}, N_{F1}),(N_{F1}, T_2), (N_{F1}, T_3), (N_{F1}, T_4), (N_{M2}, T_2), (N_{M2}, T_3), (N_{M2}, T_4)\} \tag{9}$$

Stworzony model przedstawia dwa śluby w pewnym odstępie czasu. W konstrukcie zwraca uwagę świadek $\mathbf{T_2}$, aż cztery strzałki zostały na niego skierowane – brał udział nie tylko przy pierwszym akcie ślubu, ale również przy drugim. Taki układ może sygnalizować ewentualne pokrewieństwo albo powinowactwo z panną młodą.

Scenariusz numer 3 – schemat 3

Następujący scenariusz: pan młody – kawaler ($\mathbf{N_{M1}}$) zawiera małżeństwo z panną młodą – panną ($\mathbf{N_{F1}}$). W akcie ślubu świadkują dwie osoby ($\mathbf{T_1}$, $\mathbf{T_2}$). Po dwóch latach $\mathbf{N_{M1}}$ owdowiał, gdyż żona ($\mathbf{N_{F1}}$) umiera przy porodzie drugiego dziecka. Pan młody – wdowiec ($\mathbf{N_{M1}}$) wstępuje w nowy związek małżeński z panną młodą – panną ($\mathbf{N_{F2}}$). Na świadków poproszono dwie osoby ($\mathbf{T_3}$, $\mathbf{T_4}$), które wcześniej nie świadkowały (w tej małej sieci). Po pewnym czasie umiera $\mathbf{N_{M1}}$. Wdowa ($\mathbf{N_{F2}}$) ze względu na małe dzieci staje na ślubnym kobiercu. Panna młoda – wdowa ($\mathbf{N_{F2}}$) i pan młody – kawaler ($\mathbf{N_{M2}}$) proszą dwie nowe osoby na świadków ($\mathbf{T_5}$, $\mathbf{T_6}$) – schemat 3.

Schemat 3



Notacja:

$$V = \{N_{M1}, N_{F1}, N_{M2}, N_{F2}, T_1, T_2, T_3, T_4, T_5, T_6\} \tag{10}$$

$$A = \{(N_{M1}, N_{F1}), (N_{F1}, N_{M1}), (N_{M1}, T_1), (N_{F1}, T_1), (N_{M1}, T_2), (N_{F1}, T_2), (N_{F2}, N_{M1}), (N_{M1}, N_{F2}), (N_{F2}, T_3), (N_{F2}, T_4), (N_{M1}, T_3), (N_{M1}, T_4), (N_{F2}, N_{M2}), (N_{M2}, N_{F2}), (N_{M2}, T_5), (N_{M2}, T_6), (N_{F2}, T_5), (N_{F2}, T_6)\} \quad (11)$$

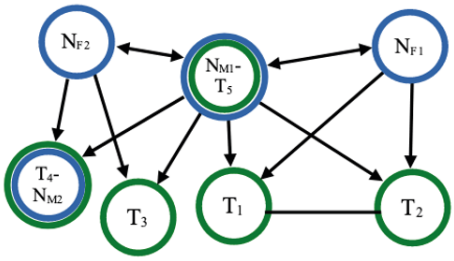
$$E = \{\{T_1, T_2\}\} \quad (12)$$

Model odtwarza trzy małżeństwa, przy ceremoniach, w których brali udział różni świadkowie. Nowością tego schematu jest wprowadzenie informacji dotyczącej relacji pomiędzy świadkami $\mathbf{T_1}$ i $\mathbf{T_2}$ – zostali oni zadeklarowani jako małżeństwo. W wyniku tego zaistniała między nimi relacja powinowactwa, która ma charakter nieskierowany. Połączenia skierowane i nieskierowane w jednym grafie jak najbardziej mogą występować[61].

Scenariusz numer 4 – schemat 4

Kolejny scenariusz: pan młody – kawaler ($\mathbf{N_{M1}}$) zawiera małżeństwo z panną młodą – panną ($\mathbf{N_{F1}}$). Świadkowały osoby ($\mathbf{T_1}$, $\mathbf{T_2}$), które były ze sobą spowinowacone. Po dwóch latach $\mathbf{N_{F1}}$ umiera. Pan młody – wdowiec ($\mathbf{N_{M1}}$) wstępuje w nowy związek małżeński z panną ($\mathbf{N_{F2}}$). Na świadków poproszono dwie nowe osoby ($\mathbf{T_3}$, $\mathbf{T_4}$). W tym samym roku, w tej samej sieci, świadek $\mathbf{T_4}$ owdowiał i wchodzi w nowy związek małżeński. I prosi na świadka $\mathbf{N_{M1}}$, który został już w grafie przyporządkowany węzłowi $\mathbf{N_{M1}}$. Powstaje pytanie, jak najlepiej graficznie przedstawić powyższą sytuację. Jak z węzła $\mathbf{T_4}$ zrobić węzeł $\mathbf{N_{M2}}$, a z węzła $\mathbf{N_{M1}}$ zrobić nowy węzeł $\mathbf{T_5}$ (schemat 4)?

Schemat 4



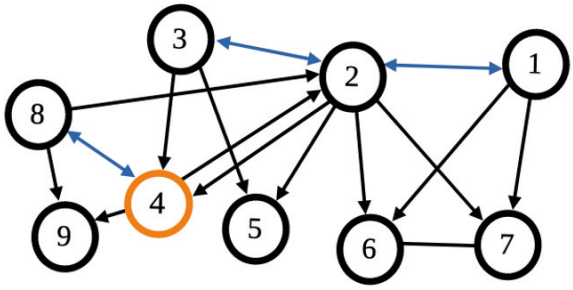
I tutaj przechodzimy do kolejnego etapu konceptu.

[61] „It is possible to combine both directed and undirected ties into one network", Yang i in., *Social Network*, 10.

Trzeci etap – modyfikacja konceptu

Dla zrozumienia prostych scenariuszy wcześniejszy koncept funkcjonował bez zarzutu. Nie jest problemem, gdy nupturienci pozostają w sieci w obrębie swojej klasy i sporadycznie wchodzą w nowe związki małżeńskie. Podobnie można wytłumaczyć funkcjonowanie świadków w takiej samej sieci. Ulega to zmianie w momencie, gdy jeden i ten sam węzeł pełni więcej niż jedną rolę w tej samej sieci. Przy wstępnej analizie materiału źródłowego, z którego wyodrębniono węzły/aktorów, przeważał aspekt atrybutowy – szukanie wśród uczestników zdarzeń podobnych cech, na podstawie których zostali poddani kategoryzacji, czego naturalną konsekwencją było wyodrębnienie trzech klas ($\mathbf{N_M}$, $\mathbf{N_F}$, $\mathbf{T}$). Jednakże dla rekonstrukcji sieci społecznościowej w czasie i przestrzeni staje się on zbyt sztywny. Powyższa analiza modyfikuje pierwotne założenia konceptu. Zamiast trzech kategorii jednego i tego samego zbioru pojawia się jeden wielki zbiór węzłów bez jakichkolwiek dalszych specyfikacji (schemat 5).

Schemat 5



Relacje małżeńskie w schemacie 5, dla lepszego rozróżnienia od pozostałych relacji, zostały oznaczone kolorem niebieskim.
Aktualna notacja:

$$V = \{1, 2, 3, 4, 5, 6, 7, 8, 9\} \tag{13}$$

$$A = \{(1,2), (2,1), (1,7), (1,6,), (2,7), (2,6), (2,3), (3,2), (2,5), (2,4), (3,5), (3,4), (4,8), (8,4), (4,9), (4,2), (8,9), (8,2)\} \tag{14}$$

$$E = \{\{6, 7\}\} \tag{15}$$

Prosta analiza węzła numer cztery (kolor pomarańczowy) w schemacie 5 pod kątem powiązań może przedstawiać się następująco:

- węzeł czwarty został poproszony na świadka na ślub pary (2–3) – relacje świadkowania,
- węzeł czwarty wyraził zgodę poślubienia węzła o numerze osiem – relacja małżeńska,
- węzeł ósmy wyraził zgodę poślubienia węzła o numerze czwartym – relacja małżeńska,
- węzeł czwarty zwrócił się do węzła o numerze drugim i węzła o numerze dziewiątym z prośbą o uczestnictwo w ceremonii ślubu – relacje świadkowania.

Reasumując: atrybuty[62] jednostki (niezależnie od tego, czy się bada osoby, grupy czy instytucje) są interesujące i ważne, ale kluczowe znaczenie dla badań sieci społecznościowych przedstawia analiza relacji między nimi – w sieci[63]. Jak ukazują powyższe przykłady, pozycje oraz role w czasie i przestrzeni ulegają zmianie. Dla przedstawionego problemu badawczego relacyjne podejście do rekonstrukcji XVIII-wiecznej sieci jest bardziej odpowiednie niż atrybutowe.

Przygotowanie bazy danych do wizualizacji sieci za pomocą programu Gephi

Do tej pory w artykule grafy zostały wykorzystane jako abstrakcyjne modele, na bazie których omówiono zagadnienia prostych struktur sieciowych. W analizie sieci społecznościowej do wizualizacji sieci wykorzystuje się różnego rodzaju programy komputerowe. W niniejszym artykule posłużono się programem Gephi[64]. Aby z niego skorzystać, należy materiał badawczy przygotować w dwóch prostych tabelach – jedna jest tworzona dla węzłów, a druga dla relacji. Do przygotowania takich tabel można wykorzystać program Microsoft Excel.

Tabela węzłów (nodelist) powinna zawierać minimum dwie kolumny: pierwsza kolumna (id) to liczby porządkowe, które są bardzo istotne, gdyż spełniają rolę

[62] Atrybutami mogą być na przykład: pozycja, stanowisko czy rola w społeczeństwie.

[63] Jürgen Pfeffer, „Visualisierung sozialer Netzwerke", w *Netzwerkanalyse und Netzwerktheorie*, *Ein neues Paradigma in den Sozialwissenschaften*, red. Christian Stegbauer (Verlag für Sozialwissenschaften, 2010), 231–38, https://doi.org/10.1007/978-3-531-92029-0_17; Sierocki, „Analiza", 231–36.

[64] Program Gephi należy do tzw. programów open-source. Na ich stronie internetowej można przeczytać: „Gephi is the leading visualization and exploration software for all kinds of graphs and networks. Gephi is open-source and free" – dostęp 29.08.2024, https://gephi.org.

klucza identyfikacyjnego, a druga kolumna (label) może zawierać ich określenia (w poniższej tabeli „label" to „zawołanie"). Ważne jest, aby dane się nie powtarzały, tzn. jest tylko jeden aktor o zawołaniu Czyż w całej sieci. Jeżeli natomiast w materiale źródłowym mamy więcej osób, które mają nazwisko Czyż, to należy sprawdzić, w miarę możliwości, o jakie osoby chodzi. W takim wypadku pomocne będzie wprowadzenie dodatkowego kryterium dla rozróżnienia aktorów np. daty chrztu.

Tabela 1. Lista węzłów

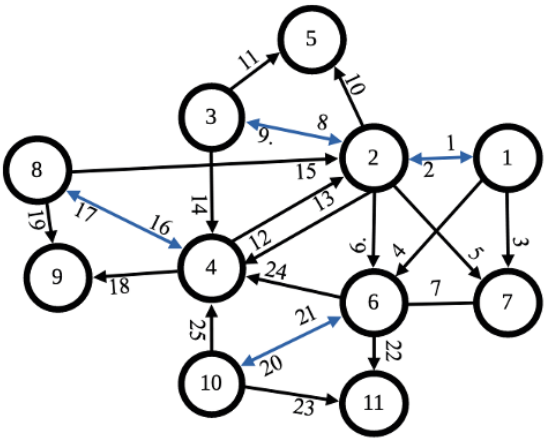
Id	Zawołanie	Płeć	Data chrztu	Data pochówku
1	Czyż	żeński	1718-03-12	
2	Baran	męski		
3	Karoń	żeński		
4	Wapler	męski		
5	Werner	męski		
6	Fider	męski		
7	Fider	żeński		1766-01-11
8	Frezer	żeński		
9	Laykauf	męski		
10	Serwin	żeński		
11	Legutek	męski		

Źródło: opracowanie własne.

Tabela numer 1 zawiera parę takich kryteriów: nazwisko czy imię (zawołanie), płeć, datę chrztu czy pochówku (patrząc przez pryzmat XVIII-wiecznej rzeczywistości). To, jakie dalsze informacje zawierać będzie tabela węzłów, jest indywidualną decyzją każdego badacza.W tabeli 2 przytoczono przykłady parametrów powiązań/relacji (edgelist) między węzłami, których mogą dostarczać księgi zaślubionych XVIII-wiecznej parafii. Wymogiem są tutaj dwie kolumny: źródło (source) i cel (target). W przykładowej tabeli 2 pierwsza kolumna oznaczona „Id" wykreowana zostaje przez Gephi (aby każdy rząd tabeli miał jednoznaczne przyporządkowanie) i nie trzeba jej umieszczać w bazie danych.

Dla poniższego przykładu została ona stworzona manualnie. Według tabeli 2 ponumerowano relacje łączące węzły w schemacie 6.

Schemat 6



Analizując połączenie o numerze 22 (tab. 2 i schemat 6), które łączy węzły o numerach 6 i 11, można powiedzieć, że relacja ma charakter skierowany i należy do kategorii świadkowania. Dodając do tego informacje z listy relacji (tab. 2), dowiadujemy się, że aktor o numerze 6 był wdowcem i między węzłami nie istniało pokrewieństwo.

Inny przykład analizy dla węzła 6 z punktu widzenia połączeń (tab. 2 i schemat 6): w roku 1765 świadkował ze swoją żoną (numer 7 w tab. 1) na ślubie panny z domu Czyż i kawalera o nazwisku Baran – relacja o numerze 7 pomiędzy węzłem 6 i 7 jest typem relacji powinowactwa. W roku 1767 jako wdowiec staje ponownie na ślubnym kobiercu (relacja małżeńska – numer 20 w schemacie 6) bez podania stanu cywilnego jego przyszłej małżonki. Na świadków poprosił dwie osoby. Świadek o numerze 4 (relacja świadkowania – numer 24 w schemacie 6.) dzierżył na tamten czas pozycję wójta w społeczności małego miasteczka (sugestia: dla prestiżu pana młodego został poproszony do świadkowania?). Ceremonię ślubną błogosławił ksiądz Stanisław Tagibor.

Tabela 2. Lista połączeń

Id	źródło	cel	typ kraw.	typ rel.	st. cy. – źr.	st. cy. – cel	rel. rodz.	dys.	zajęcie – źr.	zajęcie – cel	data ślubu	proboszcz	parafia – źr.	parafia – cel	miejs. – źr.	miejs. – cel
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	1 – Czyż	2 – Baran	a	małż.	p	k	kr.	ja		młynarz	1765-01-03	Wyporski Augustus	Żarki	Niegowa	Jaworznik	Łutowiec
2	2 – Baran	1 – Czyż	a	małż.	k	p	kr.	ja	młynarz		1765-01-03	Wyporski Augustus	Niegowa	Żarki	Łutowiec	Jaworznik
3	1 – Czyż	3 – Karoń	a	świad.	p	zam.	br.				1765-01-03	Wyporski Augustus	Żarki	Żarki	Jaworznik	Żarki
4	1 – Czyż	6 – Fider	a	świad.	p	żon.	br.				1765-01-03	Wyporski Augustus	Żarki	Żarki	Jaworznik	Żarki
5	2 – Baran	7 – Fider	a	świad.	k	zam.	br.				1765-01-03	Wyporski Augustus	Żarki	Żarki	Łutowiec	Żarki
6	2 – Baran	6 – Fider	e	świad.	k	żon.	br.				1765-01-03	Wyporski Augustus	Żarki	Żarki	Łutowiec	Żarki
7	6 – Fider	7 – Fider	a	powi.	zam.	żon.	powi.				1765-01-03	Wyporski Augustus	Żarki	Żarki	Żarki	Żarki
8	3 – Karoń	2 – Baran	a	małż.	p	wd.	br.				1767-12-15	Tagibor Stanisław	Żarki	Żarki	Jaroszów	Jaworznik
9	2 – Baran	3 – Karoń	a	małż.	wd.	p	br.		młynarz		1767-12-15	Tagibor Stanisław	Żarki	Żarki	Jaworznik	Jaroszów
10	2 – Baran	5 – Werner	a	świad.	wd.	br.	br.		młynarz	młynarz	1767-12-15	Tagibor Stanisław	Żarki	Żarki	Jaworznik	Żarki
11	3 – Karoń	5 – Werner	a	świad.	p	br.	br.			młynarz	1767-12-15	Tagibor Stanisław	Żarki	Żarki	Jaroszów	Żarki
12	2 – Baran	4 – Wapler	a	świad.	wd.	br.	br.			wójt	1767-12-15	Tagibor Stanisław	Żarki	Żarki	Jaworznik	Żarki

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
13	4 – Wapler	2 – Baran	a	świad.	wd.	zam.	br.		wójt		1767-12-28	Tagibor Stanisław	Żarki	Żarki	Żarki	Jaworznik
14	3 – Karoń	4 – Wapler	a	świad.	p	br.	br.			wójt	1767-12-15	Tagibor Stanisław	Żarki	Żarki	Jaroszów	Żarki
15	8 – Frezer	2 – Baran	a	świad.	wa	zam.	br.				1767-12-28	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
16	8 – Frezer	4 – Wapler	a	małż.	wa	wd.	kr.			wójt	1767-12-28	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
17	4 – Wapler	8 – Frezer	a	małż.	wd.	wa	kr.		wójt		1767-12-28	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
18	4 – Wapler	9 – Laykauf	a	świad.	wd.	br.	br.		wójt		1767-12-28	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
19	8 – Frezer	9 – Laykauf	a	świad.	wa	br.	br.				1767-12-28	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
20	6 – Fider	10 – Serwin	a	małż.	wd.	br.	br.				1767-12-30	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
21	10 – Serwin	6 – Fider	a	małż.	br.	wd.	br.				1767-12-30	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
22	6 – Fider	11 – Legutek	a	świad.	wd.	br.	br.				1767-12-30	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
23	10 – Serwin	11 – Legutek	a	świad.	br.	br.	br.				1767-12-30	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
24	6 – Fider	4 – Wapler	a	świad.	wd.	zam.	br.			wójt	1767-12-30	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki
25	10 – Serwin	4 – Wapler	a	świad.	zam.	wd.	br.			wójt	1767-12-30	Tagibor Stanisław	Żarki	Żarki	Żarki	Żarki

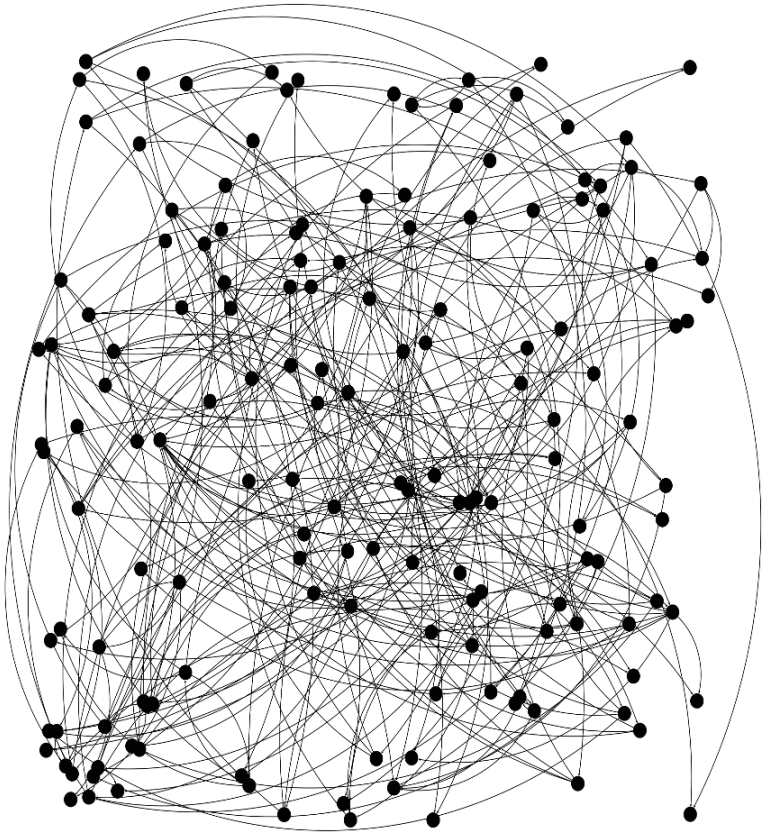
Objaśnienie skrótów: **nagłówki tabeli**: typ kraw. – typ krawędzi; typ rel. – typ relacji; st. cy. – źr. – stan cywilny – źródło; st. cy. – cel – stan cywilny – cel; rel. rodz. – relacja rodzinna; dys. – dyspensa; zajęcie – źr. – zajęcie – źródło; **informacje wpisane w kolumny tabeli**: a – skierowane połączenie, e – nieskierowane połączenie, małż. – małżeński, świad. – świadkowanie, powi. – powinowactwo, p – panna, k- kawaler, zam. – zamężna, żon. – żonaty, wd. – wdowiec, wa – wdowa, br. – brak, pokr. – pokrewieństwo.

Źródło: opracowanie własne na podstawie https://www.familysearch.org, dostęp 24.08.2024.

Przykład sieci skierowanej na podstawie ksiąg zaślubionych parafii żareckiej

Ilustracja 2 przedstawia tzw. graf surowy. Program Gephi wygenerował go losowo na podstawie wprowadzonych informacji (nodelist, edgelist) bazujących na materiale źródłowym księgi zaślubionych z lat 1718–1720[65].

Ilustracja 2. Sieć społeczno-towarzyska mieszkańców parafii żareckiej (1718–1720)



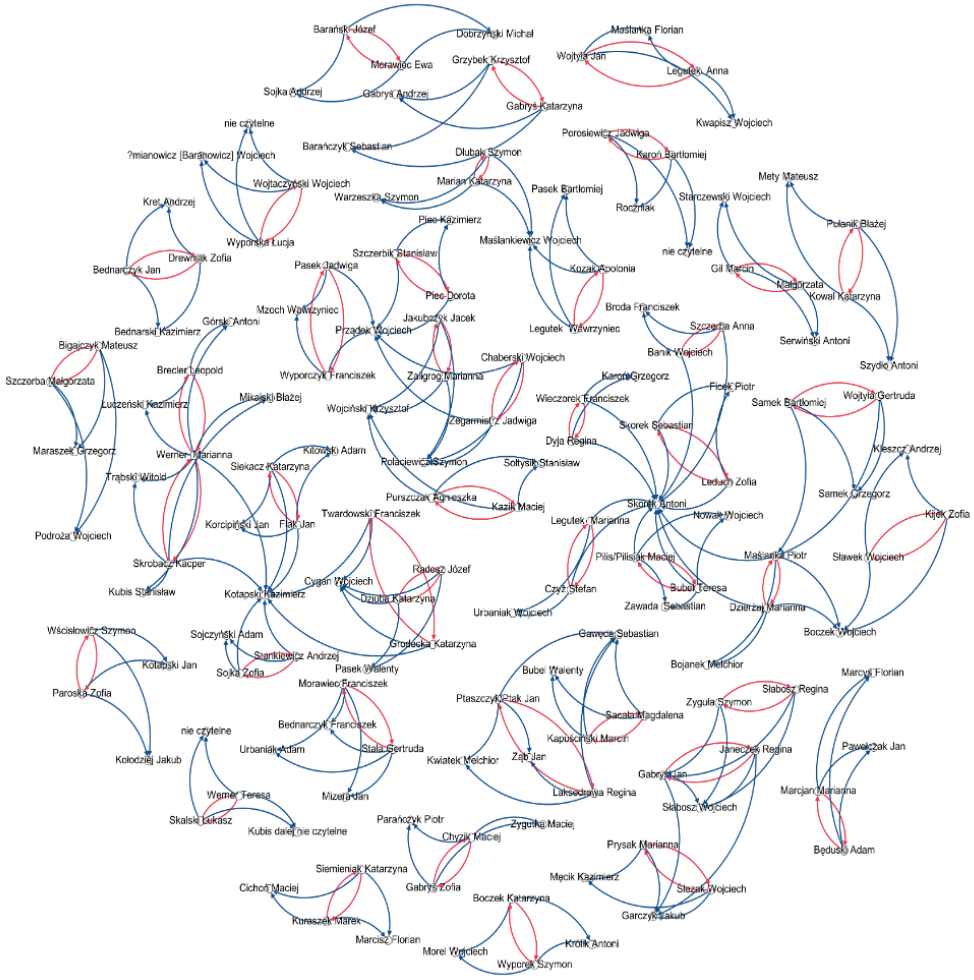
Przez ten dość krótki okres społeczność żarecka zanotowała 154 aktorów (węzły)[66] i 266 skierowanych relacji, z czego 84 to relacje małżeńskie. Liczba zawartych małżeństw wynosi 42. Forma sieci przypomina kłębek linii i punktów.

[65] Baza danych: Family Search, dostęp 26.03.2024, https://www.familysearch.org/. Wpisy pochodzą z pierwszej serii księgi zaślubionych 1718–1770.

[66] Duchowieństwo zostało wykluczone. Patrz część „Pierwszy etap".

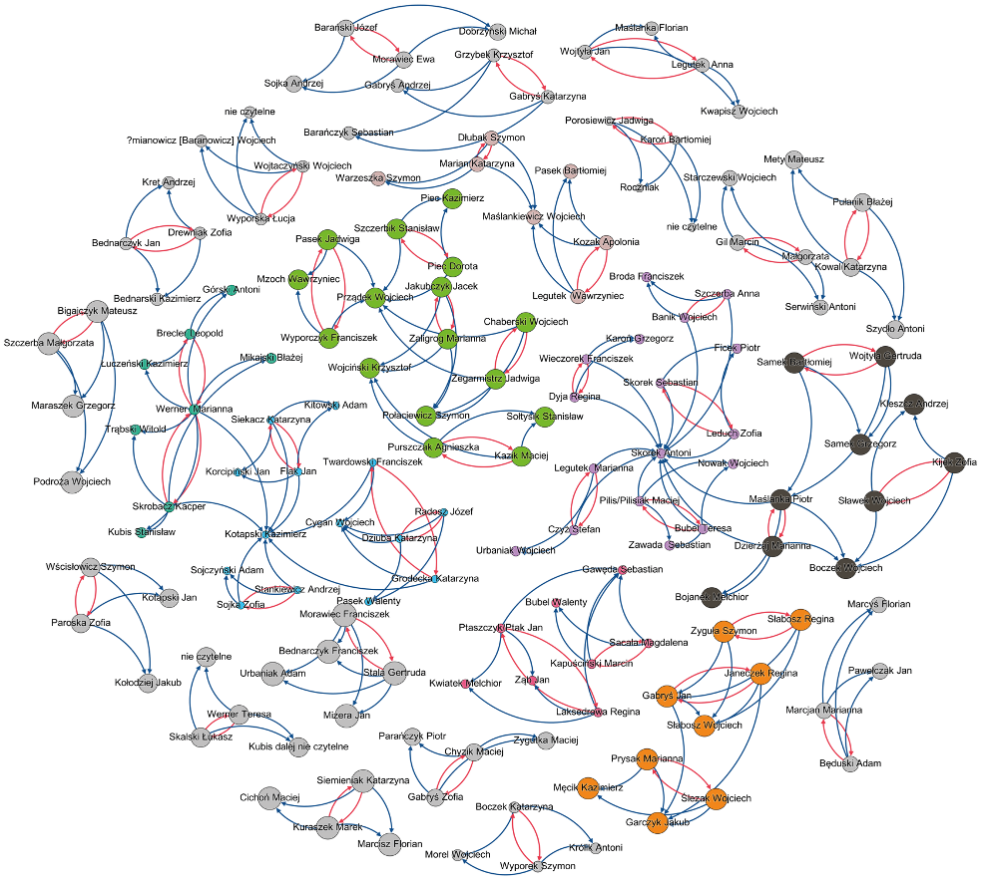
Dla lepszej wizualizacji pierwotna sieć została poddana dalszej specyfikacji przy pomocy algorytmu Fruchterman Reingold. Algorytm ten działa na zasadzie spirali. Każdy węzeł zostaje poddany siłom przyciągania i odpychania[67], aby znaleźć jego optymalne położenie w strukturze. Ponadto wyodrębniono kolorem czerwonym relacje małżeńskie i dodano określenia węzłów (pismo zmodernizowane) – ilustracja 3.

Ilustracja 3. Sieć społeczno-towarzyska mieszkańców parafii żareckiej (1718–1720). Algorytm Fruchterman Reingold



[67] Pfeffer, „Visualisierung”, 5–6.

Ilustracja 4. Sieć społeczno-towarzyska mieszkańców parafii żareckiej (1718–1720). Podział według klas modularności



Wygenerowaną sieć można poddawać różnorodnym analizom, których dostarcza metoda analizy sieci społecznościowej i które zostały ujęte w programie Gephi. Opisanie wszystkich narzędzi analitycznych czy statystycznych SNA wybiega poza ramy tego artykułu. Poniższy przykład jest tylko namiastką tej metody. Ilustracja 4 ukazuje wyodrębnione z całej sieci mniejsze komponenty (kolor zielony, pomarańczowy czy czarny) nazywane klastrami, modułami czy klikami – których struktury można odizolować i poddać dalszym badaniom powiązań sieciowych. Poza tym w poniższej sieci daje się wyodrębnić jednostki (Skorek Antoni czy Kotapski Kazimierz), które skupiają na sobie większą liczbę relacji skierowanych. Te tendencje można przeanalizować pod kątem współczynnika centralności (stopnia, pośrednictwa czy bliskości).

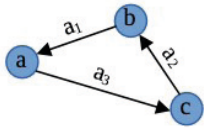
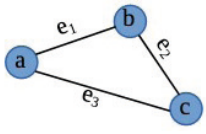
Wnioski

Wyniki z artykułu to seria modeli obrazujących w plastyczny sposób poszczególne etapy konceptu zastosowania metody analizy sieci społecznościowej na potrzeby demografii historycznej. Przedstawione zostały podstawowe pojęcia: graf, sieć, sieć społeczna, węzeł, relacje skierowane i nieskierowane. Z połączeń dwóch najmniejszych elementów (węzły i relacje) powstające struktury pozwoliły – wprawdzie abstrakcyjnie, ale jednak – stworzyć modele na podstawie informacji zaczerpniętych ze źródeł parafialnych. Zdefiniowano ramy sieci społeczno-towarzyskiej, na którą składają się oblubieńcy i świadkowie zwykli. Duchowni, z racji tego, że zajmowali pozycję świadka z urzędu, zostali pośrednio wykluczeni ze zbioru węzłów, ale informacje o nich ujęto w bazie danych poszczególnych relacji. Stworzone schematy miały na celu uwidocznić problem rozumowania atrybutowego jednostek i roli relacji między nimi. W centrum zainteresowań sieci społecznej stoją powiązania/relacje między jednostkami i dopiero z tej perspektywy bada się, analizuje i opisuje rolę jednostek w sieci. Wyodrębniono dwa typy relacji: małżeńska – zachodząca między dwoma nupturientami, symetryczna o charakterze skierowanym, obustronna i świadkowania – zachodząca między nupturientami a świadkami zwykłymi, asymetryczna o charakterze skierowanym. Dla wizualizacji sieci przy pomocy programów komputerowych przytoczono przykłady tabel, które na ich potrzeby strukturyzują bazę danych. Jako efekt końcowy wygenerowano sieć społeczno-towarzyską parafii żareckiej. Przytoczony przykład co prawda obejmuje tylko trzy lata, jednak już można wyodrębnić pewne tendencje, jak np. tworzenie klik albo kumulacja relacji na jednym węźle.

Ograniczenia metody SNA mogą wynikać z materiału badawczego, w tym wypadku są to księgi zaślubionych. Tak skonstruowana sieć społeczna jest tylko namiastką społeczeństwa, które faktycznie istniało w XVIII wieku. Z powyżej zdefiniowanych relacji małżeńskich nie wynika na przykład, w jakim stopniu oblubieńcy zostali przymuszeni do danego związku. Trudno jest wyczytać, a jeszcze trudniej zmierzyć, czy relacje te były oparte na uczuciach. Trudno też definiować relacje pokrewieństwa pomiędzy świadkami albo świadkami i nupturientami na podstawie zbieżności nazwisk. Kolejne ograniczenie może wynikać z formy przygotowywania bazy danych, ponieważ wiąże się z dużym nakładem pracy – żmudnym czytaniem ksiąg metrykalnych, następnie konsolidowaniem danych i strukturyzowaniem na potrzeby metody SNA. Mimo ograniczeń metody, uzyskane dzięki niej korzyści poznawcze małomiasteczkowej struktury społecznej mogą przyczynić się do lepszego zrozumienia mechanizmów dzisiejszej rzeczywistości.

ANEKS

Aneks 1. Zestawienie graf skierowany – graf nieskierowany[1]

	Graf skierowany	Graf nieskierowany[7]
Formuła	$G_d = (V, A)$[3] Directed Graph = (Vertex, Arc)	$G = (V, E)$[2] Graph = (Vertex[4], Edge)
Znaczenie skrótów	G_d – graf skierowany V – wierzchołek A – łuk	G – graf V – wierzchołek E – krawędź
Definicja	Graf skierowany składa się z dwóch skończonych zbiorów: wierzchołków (V) i łuków (A). Zbiór wierzchołków nie jest pusty, natomiast zbiór łuków może być pusty	Graf nieskierowany składa się z dwóch skończonych zbiorów: wierzchołków (V) i krawędzi (E). Zbiór wierzchołków nie jest pusty, natomiast zbiór krawędzi może być pusty
	Gdzie do każdego łuku (A) została przyporządkowana para wierzchołków	Gdzie każdej krawędzi (E) została przydzielona para wierzchołków (choć nie zawsze różne)
Inne nazwy dla V	węzeł, punkt	węzeł, punkt
Inne nazwy dla A/E	A: krawędź skierowana, linia skierowana, łuk, strzałka	E: krawędź nieskierowana, linia
Forma zapisu dla V – przykład	$V = \{a,b,c\}$	$V = \{a,b,c\}$
Forma zapisu dla A/E – przykład	$A = \{a_1, a_2, a_3\}$ $a_1 = \{(b,a)\}$[5]	$E = \{e_1, e_2, e_3\}$ $e_1 = \{a,b\}$[4]
Zasadnicze różnice w A/E	A: Połączenie funkcjonuje tylko w kierunku skierowanej krawędzi, czyli z **b** do **a,** a nie z **a** do **b**	E: Kierunek w grafie może być z **a** do **b** i z **b** do **a**
Węzeł początkowy/ końcowy	$a_1 = (b,a)$ punkt b to punkt początkowy krawędzi a_1, punkt a to punkt końcowy krawędzi a_1	$e_1 = (a,b)$ punkty a i b to punkty końcowe linii/ relacji e_1
Przykłady		

Źródło: opracowanie własne na podstawie: John Clark, Derek Allan Holton, *Graphentheorie Grundlagen und Anwendungen*, Spektrum 1994; Peter Trittmann, *Graphentheorie: eine anwendungsorientierte Einführung*, Hanser Verlag, 2011; Robin J. Wilson, *Introduction to Graph Theory*, Longman 1996.

„The language of graph theory is not standard – all authors have their own terminology (…). Any such definition is perfectly valid, provided that it is used consistently" cytat z R.J. Wilson, Introduction to Graph Theory, s. 9. Dlatego podaje się poniżej inne formy notacji:

1. Wg Jacek M. Wojciechowski i Krzysztof Pieńkosz, *Grafy i sieci* (Wydawnictwo Naukowe PWN 2013), 1. Grafem niezorientowanym określa się graf nieskierowany a grafem zorientowanym określa się graf skierowany.
2. Inna forma zapisu: G = (V(G)), E(G)) wg adnotacji: Clark, Holton, *Graphentheorie*, 2.
3. Inna forma zapisu: G = (V, E) wg adnotacji: Trittmann, *Graphentheorie*, 127 lub D = (V(D)), A(D)) wg Wilson, *Introduction*, 100.
4. Albo „nodes": Wilson, *Introduction*, 8.
5. Inna forma zapisu: e_1 = {a,b} wg adnotacji: Trittmann, *Graphentheorie*, 13 lub e_1 = ab wg adnotacji: Wilson, *Introduction*, 8.
6. Inna forma zapisu: a_1 = ba wg adnotacji: Wilson, *Introduction*, 101.
7. Graf nieskierowany G = (V, E) można uzyskać z grafu skierowanego G_d = (V, A), kiedy przechodzi się stopniowo z A do A' $\supset$ A, dodając a_1 = (b,a) $\in$ A $\subset$ A', a_1 '= (a,b) i identyfikując parę a_1 i a_1' za pomocą e_1 = (a,b) $\in$ E. W związku z tym grafy nieskierowane są grafami ogólnymi. Clark, Holton, *Graphentheorie*, 252–253; Wilson, *Introduction*, 100–102.

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Zastosowanie metody analizy sieci społecznościowej do rekonstrukcji sieci społeczno-towarzyskiej na przykładzie ksiąg zaślubin XVIII-wiecznej parafii żareckiej

Streszczenie

Artykuł przedstawia możliwości praktycznego zastosowanie metody SNA do rekonstrukcji XVIII-wiecznej sieci społeczno-towarzyskiej małomiasteczkowej społeczności na przykładzie ksiąg zaślubionych parafii żareckiej. Po zapoznaniu się z głównymi pojęciami analizy sieci społecznej (węzeł, relacja skierowana i nieskierowana) zostały one jeszcze bliżej zdefiniowane na graficznych modelach. Etapowe omawianie konceptu z wykorzystaniem metody SNA w celu odtworzenia struktur społecznych ma bardziej uwidocznić problematykę atrybutowości węzłów i relacji między nimi w sieci. Konsekwencją tego jest zmiana początkowego konceptu realizacji odtwarzania sieci z punktu widzenia węzłów/aktorów na korzyść relacji. Na potrzeby wizualizacji sieci wykorzystano oprogramowanie Gephi. Efektem końcowym jest przykład sieci skierowanej utworzonej na podstawie ksiąg zaślubionych parafii żareckiej z lat 1718–1720. Artykuł ma charakter praktycznego przedstawienia zastosowania metody SNA z wykorzystaniem źródła demograficznego.

Application of the Social Network Analysis Method to the Reconstruction of a Social and Kinship Network Based on the Marriage Registers of the 18th Century Parish of Żarki

Summary

The article outlines the practical applicability of the SNA method for reconstructing the social network of a small town community in the 18th century, based on the marriage registers of the parish of Żarki. After reviewing the main concepts of social network analysis (nodes, directed and undirected relationships), they were further defined on graphical models. A step-by-step discussion of the concept using the SNA method to reconstruct social structures is intended to make the problem of attributionality of nodes and relationships between them in the network more apparent. As a result, the initial concept of implementing network reconstruction from the perspective of nodes/actors is changed in favor of relationships. The Gephi program was used to visualize the network. The final result is an example of a directed network created using the marriage registers of the Żarki parish from 1718–1720.
The article is a practical presentation of the application of the SNA method using a demographic source.

Cytowanie

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