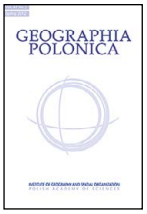

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THE ROLE OF NAMING IN SHAPING REGIONAL IDENTITY AND ATTACHMENT IN POLYCENTRIC URBAN REGIONS: THE CASE OF POLAND

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Abstract

Polycentric urban regions encompass centres that function both independently and as parts of an integrated whole, which presents a challenge to their functional integration. This study investigates how regional naming captures a specific dimension of this integration: residents' regional identity and attachment. Based on a survey conducted among 3,084 residents of Poland's eight largest urban regions, the analysis indicates that the name of a region can serve as a symbolic vehicle of meaning, shaping spatial perception and fostering residents' sense of connection. As such, constructing narratives around the region's name can become a tool for supporting integration processes within polycentric urban regions.

Keywords

polycentric urban regions • place names • regional identity • regional attachment • Poland

Introduction

This paper contributes to the literature on the functional integration of polycentric urban regions (PURs), i.e. regions containing "multiple, relatively proximate centers, where development across these centers is mutually beneficial and balanced" (Harrison et al., 2022: 3). More specifically, we examine Polish PURs to investigate the significance of a shared name as a sign of regional integration. Our analysis focuses on how this shared name influences residents' regional identity and sense of belonging.

Polycentric urban regions (PURs) possess both a morphological dimension and a broader functional aspect. Morphologically, PURs are simply urban centres located close to one another. Functionally, these regions also demonstrate "significant functional interconnection and complementarity" among the various centres (Davoudi, 2007: 11). PURs can develop through gradual, incremental changes within the regional urban system or through deliberate planning policies (Hall, 2009), making them an essential concept for planners and policymakers (Van Houtum & Lagendijk, 2001). This establishes PURs as both a tangible empirical phenomenon and a potential policy framework for the urban centres they encompass (Derudder et al., 2022). Given this, PURs may offer multiple benefits, including for the smaller centres within the region (Vandermotten et al., 2008; Veneri & Burgalassi, 2012; Kramar & Kadi, 2013; Sun & Lv, 2020).

According to Wang et al. (2019), the combined agglomeration effects of multiple centres within a polycentric urban region (PUR) can match or even exceed those of a single large centre. This potential has been explored in the literature through the concepts of "borrowed size" and "urban network externalities," suggesting that "a group of functionally integrated small cities can exhibit characteristics of a larger city" and benefit from synergies and complementarities (Wang et al., 2019, p. 5). This clearly suggests that functional integration is crucial for PURs to thrive. Yet, it also represents a significant challenge with the model. As Meijers (2008) pointed out, "summing small cities does not make a large city," indicating that morphologically defined PURs often lack functional cohesion, leading to fragmentation and instability (Cardoso & Meijers, 2017). To truly "reap the benefits of their aggregated size as a fully-fledged metropolitan environment," historically and administratively distinct centres (Meijers, 2007; Liu et al., 2018) must undergo a process of functional integration (Meijers et al., 2018: 18).

To prevent PURs from remaining a loose collection of poorly connected cities, it is essential to foster a "metropolitan milieu" and a "sense of region," which can enhance internal cohesion (Cardoso & Meijers, 2017: 5). These concepts pertain to the relationships individuals have with places and are based on two interconnected but distinct dimensions: cognitive and affective relations. The cognitive dimension, often referred to as "place identity," involves self-identification that allows individuals to *understand and define* their surroundings. In contrast, the affective dimension, known as "place attachment," represents the *emotional connections* individuals have with a place (Rollero & De Piccoli, 2010). In this context, Van Houtum and Lagendijk (2001) identified three interrelated dimensions of regional identity within PURs: functional, strategic, and cultural. Developing such an identity is a complex process requiring an integrated approach across all three dimensions.

Research indicates that a region's name can play a significant role in fostering both identification with and attachment to that region (Cardoso & Meijers, 2017). However, the scientific community has largely overlooked the potential of toponymy research in examining local and regional identity, often perceiving place names as merely neutral labels (Conedera et al., 2007). However, this perspective began to change with the "critical turn" in toponymy studies, which emphasises a deeper understanding of the politics of naming and its social and cultural implications

(Rose-Redwood, 2011, 2016). Despite the heightened focus on place names resulting from this critical approach, their influence on the evolution and formation of places and regions remains underexplored.

This paper starts from the assumption that the way in which residents perceive the name of their region can constitute an essential factor in the formation of relationships between people and places at the regional scale. Therefore, our study examines the relationship between a region's name and the formation of both regional identity and regional attachment in prospective PURs. To achieve this, we utilise the three dimensions of regional identity identified by Van Houtum and Lagendijk (2001). This research contributes to the broader discourse on the PUR concept, which has often been analysed within a north-western European context (Dieleman & Faludi, 1998) but has gained global relevance (Harrison, et al., 2022). PURs have been extensively studied in North America (Meijers & Burger, 2010) and, above all, China (Liu et al., 2016), with increasing research emerging on Latin America, Asia, and Africa (Derudder et al., 2022; Harrison et al., 2022). We focus on Poland, aligning with the growing body of PUR-related research in Central and Eastern Europe (Szabó et al., 2014; Malý, 2016; Bartosiewicz & Marcińczak, 2020a). We examine eight major urban regions and base our analysis on a questionnaire survey conducted among their residents. The survey examines residents' sense of regional identity and attachment – allowing for the analysis of both cognitive and affective bonds with place – as well as their perception of the region's name. A standardised survey instrument enabled the collection of data from a large and diverse sample, facilitating statistical analysis of relationships between variables and the identification of general patterns across different regional contexts. While qualitative approaches can provide deep, context-rich insights into the lived experiences of identity and attachment, this research focuses on modelling the associations between selected variables to highlight the overarching dynamics that shape residents' regional bonds.

The remainder of this article is organised as follows: The next section provides an overview of the theoretical background related to the formation of place identity and place attachment within a regional context, emphasising the potential influence of a region's name. Following this, we describe the research design, including discussions on the research context, data collection, and methodologies employed. We then present the study's findings, followed by a concluding section that discusses these results, their implications, and possible directions for future research.

Literature review

PURs in Central and Eastern Europe: The Polish perspective

The central idea of the PUR concept is that centres within the PUR operate as distinct entities but also as integral components of a larger region (Hall, 2009). This entails the emergence of new regional forms that do not have a clear historical precedent in terms of scale or administrative structure (Cardoso & Meijers, 2017). Morphologically, PURs can develop through three modes of dispersion identified by Champion (2001): centrifugal, incorporation, and fusion. The functional formation of PURs is a dynamic and ongoing process without a definitive endpoint; it "is not something that exists, but rather that becomes" (Cardoso & Meijers, 2017: 9; cf. Paasi, 2010). Therefore, it is crucial to continually nurture and strengthen functional linkages between these centres in order to "move from fragmentation to integration" (Meijers et al., 2018: 18).

Since the 1990s, polycentricity has emerged as a central concept in territorial governance and development within European policies (Harrison et al., 2022). While research in this area has been extensively conducted in North-Western Europe, the concept is also gaining traction in Central and Eastern European countries (Kramar & Kadi, 2013; Bartosiewicz & Marcińczak, 2022). In this region, the spatial

structure of cities differs (Meijers et al., 2018), as its socialist legacy has significantly shaped it. The socialist era began with a focus on intensive industrialisation aimed at economic development, which subsequently transitioned into significant urbanisation along with state-planned decentralisation of employment (Mulíček & Malý, 2019; Marcińczak & Bartosiewicz, 2024). The collapse of the socialist system in the 1990s prompted substantial changes in the spatial distribution of population and employment (Krzysztofik et al., 2017; Mulíček & Malý, 2019). Nevertheless, despite these unique historical conditions, these processes "reflect mainly global urbanization trends" (Szabó et al., 2014: 288) and indicate that the "socialist system set similar preconditions for the development of polycentric urban structures to those known from Western Europe" (Bartosiewicz & Marcińczak, 2022: 8).

Research on polycentricity in Poland often focuses on the national scale, highlighting the polycentric structure of the country's settlement network (Śleszyński, 2009; Komornicki et al., 2013; Król et al., 2018; Bocheński, 2023). At the regional scale, analyses have mainly focused on regional integration through transport and commuting linkages (Bański et al., 2012; Gwosdz & Sobala-Gwosdz, 2012; Zuzańska-Żyśko, 2018), but also on economic issues (Krzysztofik et al., 2019a; Zuzańska-Żyśko, 2021) and planning policies (Runge et al., 2020; Lorens & Golędzinowska, 2022). A comprehensive approach is presented in the study by Bartosiewicz and Marcińczak (2020b), in which they observed the differentiation of regional structures in various parts of Poland, reflecting historical partitions of Poland. With few exceptions, monocentric regions dominate in the eastern part of the country. This is confirmed by the studies of Bański and Czapiewski (2015) on the Mazowieckie Voivodeship and those of Polski (2016) on the Lubelskie Voivodeship, which emphasise the underdeveloped network of cities and the lack of centres that could even support the main city. In contrast, in the southern part of Poland, they observed more polycentric and decentralised regions, whose structures resulted from their mining and industrial activities, as well as the terrain's morphology. Among them, the most frequently analysed example in the literature is The Upper Silesia and Zagłębie Metropolis (Krzysztofik et al., 2017, 2019b; Sporna & Krzysztofik, 2020). In another study, Bartosiewicz and Marcińczak (2022a) analysed changes in the urban structure of Polish regions in the context of post-socialist transformation. Examining the employment distribution and commuting patterns as indicators of morphological and functional polycentricity, they found that, despite the overall increase in the degree of polycentricity in Polish regions, it remained relatively low and depended on the initial structure of the regions and the specifics of their subsequent economic and demographic transformations.

Place identity and place attachment in the context of PURs

Van Houtum and Lagendijk (2001: 751) argued that PURs also "develop and position themselves through a process of regional identification." This process both aids residents in recognising their place within this intricate structure and cultivates a shared regional identity. In this context, Lewicka (2011; cf. Tuan, 1975) emphasises that the clearer a space is defined geographically and cognitively, the more likely it is to evolve into a place with which residents can identify. Individuals can simultaneously form connections with places at multiple scales, where an identity at one level does not preclude an identity at another (Lewicka, 2011; Kübler, 2016). This identity, which represents the cognitive dimension of the relationship with place, serves as a robust foundation for developing place attachment, constituting the affective dimension (Rollero & De Piccoli, 2010).

Place attachment enhances residents' sense of community, strengthening their belief in political efficacy and motivating them to engage in actions that benefit their area socially and politically (Kübler, 2016; see also Manzo & Perkins, 2006). This attachment

is closely linked to direct experiences within a space (Tuan, 1975) and the value that individuals assign to it (Manzo, 2003). As a result, people tend to feel the strongest connection to spaces where they engage in their daily activities, with this attachment often diminishing as the scale of the place enlarges. Consequently, many studies have concentrated on attachment to smaller scales, such as homes, neighbourhoods, or cities, often neglecting the regional scale, which may be perceived as too expansive for residents to experience directly (Lewicka, 2011). However, with increasing mobility, residents' ability to experience and connect with larger spaces has also grown (Kübler, 2016). In tandem with this heightened mobility, the expanding reach of social and economic processes (Meijers & Burger, 2010) indicates that regions may become a more relevant scale for understanding residents' social interactions and daily activities.

Van Houtum and Lagendijk (2001) identified three dimensions of regional identity in their study of polycentric urban regions (PURs): functional, strategic, and cultural. While these dimensions are interrelated, they can vary based on temporal and spatial contexts. The functional dimension emphasises the connections and ties that unify various centres into a cohesive, functional whole. It involves identifying which areas are integrated into the region's functional network and which remain outside it. The strategic dimension focuses on establishing shared perspectives and goals for the region, aimed at enhancing its position both externally – such as in response to global economic competition – and internally by promoting integration and synergy among the centres. Lastly, the cultural dimension represents a dynamic and ongoing process that fosters a collective sense of belonging, often emphasising distinctiveness – where the identity of "us" is defined in contrast to "others." Consequently, shaping regional identity is a complex process that requires an integrated approach across multiple factors. This complexity can manifest in tangible ways; for instance, the development of a collective regional identity is often reflected in the naming of the region (Peteet, 2013; Giraut & Houssay-Holzschuch, 2016).

Naming as a tool for regional cohesion

A region's name can be a crucial tool for identifying and organising space, supporting management and planning efforts (Rose-Redwood et al., 2010). Naming is integral to the process through which places "become." As Tuan (1991: 689) pointed out, a name can "create a seemingly coherent reality out of a congeries of disparate parts." This insight holds particular significance for PURs, as these perforce arise from the synergy of distinct, autonomous areas. There are various practices for regional naming, and their effectiveness often hinges on the specific characteristics of the region in question (Cardoso & Meijers, 2017). A region's name can also reflect the nature of relationships among its constituent cities. For example, some regions are named after a dominant central city, such as Greater London, which may reinforce that city's prominence. Alternatively, some regions adopt a naming convention that combines the names of the cities within them, as exemplified by Padua–Treviso–Venice. This approach highlights the interconnections between cities and promotes cooperation and a sense of equality among them.

In some instances, a completely new name is adopted for a region, often in an effort to redefine its identity. Such names can encapsulate a shared vision and set of objectives that various stakeholders in PUR development collectively aspire to achieve. Simultaneously, a new name can influence external perceptions of the region, imbuing it with strategic significance for positioning and branding (Cardoso & Meijers, 2017). In this context, the name transcends its role as a mere label, shaping the understanding of the region (Rose-Redwood, 2008). For example, the Randstad region, often regarded as a PUR archetype (Derudder et al., 2022), incorporates the Dutch word for "city," to reflect the region's cohesion (Van Oort et al., 2010). Similarly, the name Flemish Diamond, as noted by Van Houtum

and Lagendijk (2001), was coined as a "play on words," using the diamond metaphor to emphasise the region's potential for development. These illustrations demonstrate that names "are not accidental or politically neutral but are chosen and foregrounded as being somehow 'appropriate', while other, less acceptable, names are overlooked or marginalized" (Light & Young, 2015: 436). Different locations have different symbolic significance (Gnatiuk & Glybovets, 2020). Thus, the act of naming embodies a certain level of control over the region, becoming a strategic tool open to manipulation by those with the authority to assign it (Myers, 1996). A new regional name can also evoke a shared history or origin, reinforcing common values among residents, as seen in examples like the Basque Country (Van Houtum & Lagendijk, 2001). Conversely, Myers (1996) suggests that, in areas with a strong regional identity, names often delineate the boundaries of regional cultures. This dual role of regional names allows them to foster internal unity while distinguishing one area from another. In this way, names play a culturally significant role in cultivating a sense of belonging, acting as symbolic boundaries that define "us" and differentiate "us" from "others" (Myers, 1996; Van Houtum & Lagendijk, 2001; Rose-Redwood et al., 2010).

Two key observations arise from this discussion. First, although PURs are frequently perceived as socially and spatially fragmented and have been criticised for prioritising external image over internal cohesion (Cardoso & Meijers, 2017), they also possess the potential to foster identity and attachment among residents. Second, due to the complexity and multifaceted nature of place names, these names can play a significant role in shaping and influencing the development of these relationships.

Methodology: approach and data

Study area and research tool

Guided by our research assumption, we analyse the metropolitan regions that feature Poland's most significant urban centres, as urban functions are closely linked to population size and hierarchical positioning within the settlement system (Smętkowski et al., 2009). According to the EUROREG report (2008), the largest metropolitan regions are Warsaw, Upper Silesia and Zagłębie Metropolis, Gdańsk–Gdynia–Sopot, Kraków, Poznań, Łódź, and Wrocław. Bydgoszcz and Toruń were evaluated separately in the EUROREG report and did not individually meet the population criteria to be classified among the largest metropolitan centres. However, our study combines Bydgoszcz and Toruń into a single metropolitan area, aligning with the recognition of their potential for polycentric development in the ESPON report (2004).

Given that PURs often do not exist as formally defined administrative units, it was essential to adopt a consistent approach for their delimitation. To establish precise boundaries for the regions under study, we utilised the areas of integrated territorial investments (ITI) effective as of January 1, 2020, which encompass cities and their functionally connected areas (see Figure 1). Our data are derived from a survey with a sample of 3,084 respondents proportionally divided among all studied metropolitan regions. The survey was conducted from October 28 to November 14, 2024, employing the Computer Assisted Web Interview (CAWI) method for online data collection. We implemented quality control procedures at various stages of the research process to ensure the reliability of the collected data. These procedures included eliminating duplicate submissions through verification of cookies and IP addresses, monitoring survey completion time to discard questionnaires that were filled out too quickly, incorporating attention check questions, and verifying consistency and logic of responses (by discarding questionnaires that contained contradictory statements). The sample was designed to reflect the social structure of the regions, ensuring representativeness concerning gender, age, and place of residence (see Tab. 1).

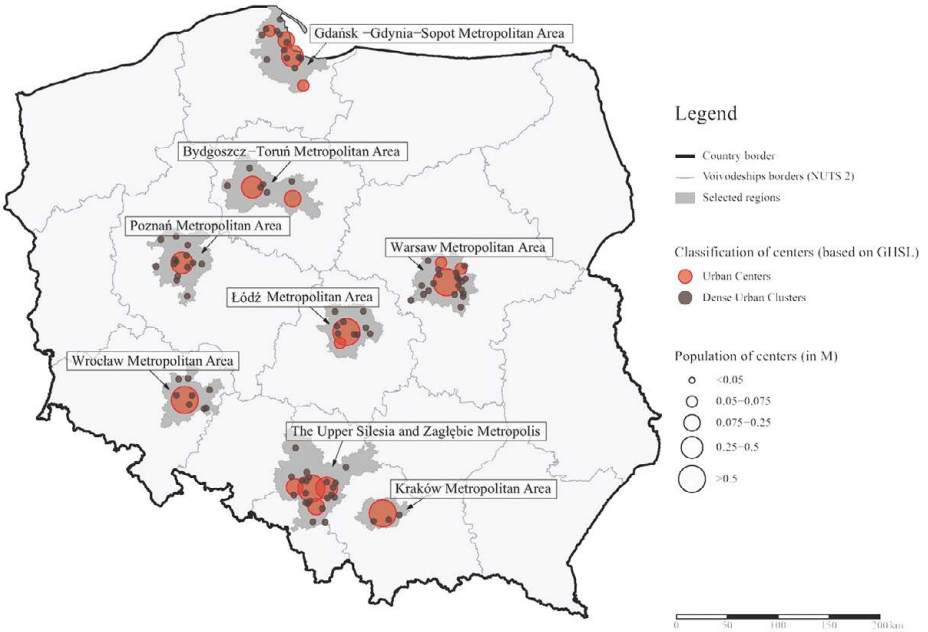

Figure 1. Locations of the selected regions and urban centres

Table 1. Data sample

Region		Total	Gender		Age			Place of residence			
			Female	Male	18-44	45-64	65+	Village	City to 20k	City 20--100k	City 100k+
Warsaw Metropolitan Area	Proportion of sample	100.0	53.6	46.4	44.9	30.9	24.2	9.9	3.1	15.7	71.3
	Sample size	770	413	357	346	238	186	76	24	121	549
The Upper Silesia and Zagłębie Metropolis	Proportion of sample	100.0	52.9	47.1	42.6	35.0	22.4	7.4	4.6	26.5	61.5
	Sample size	646	342	304	275	226	145	48	30	171	397
Gdańsk–Gdynia–Sopot Metropolitan Area	Proportion of sample	100.0	53.0	47.0	52.4	30.8	16.8	17.4	3.7	17.1	61.8
	Sample size	351	186	165	184	108	59	61	13	60	217
Kraków Metropolitan Area	Proportion of sample	100.0	55.4	44.6	48.0	28.4	23.6	15.1	1.8	4.1	79.0
	Sample size	271	150	121	130	77	64	41	5	11	214
Poznań Metropolitan Area	Proportion of sample	100.0	54.9	45.1	49.3	32.2	18.5	24.1	6.3	10.1	59.4
	Sample size	286	157	129	141	92	53	69	18	29	170
Łódź Metropolitan Area	Proportion of sample	100.0	54.4	45.6	41.3	32.5	26.1	9.2	4.2	13.1	73.5
	Sample size	283	154	129	117	92	74	26	12	37	208
Wrocław Metropolitan Area	Proportion of sample	100.0	52.8	47.2	50.0	29.2	20.8	14.4	4.8	5.2	75.6
	Sample size	250	132	118	125	73	52	36	12	13	189
Bydgoszcz–Toruń Metropolitan Area	Proportion of sample	100.0	52.9	49.8	53.3	31.3	15.4	15.0	6.6	5.7	72.7
	Sample size	227	114	113	121	71	35	34	15	13	165

Approach to data processing and analysis

The two primary variables examined in this study are regional identity and regional attachment. To assess these dimensions of regional identity, we developed a set of 13 statements that encapsulate the core assumptions underlying each dimension (see Tab. 2). Respondents rated their level of agreement with these statements on a five-point Likert scale, where 1 represents "no agreement" and 5 signifies "full agreement" (see Fig. 2). Composite scores for each dimension of identity were calculated as the average of the ratings for the statements, culminating in a synthetic evaluation. Meanwhile, regional attachment was defined by the importance respondents placed on belonging to their region, measured on a scale from 1 (not important at all) to 5 (very important).

We were also interested in how residents perceive the names of their regions. Each respondent was shown the name of the region corresponding to their place of residence – either the official name of a given region or the one most commonly found in planning and administrative documents. Of course, individuals may identify with places in different spatial scales simultaneously – such as their municipality ("municipality" in the Polish context translates to *gmina*, i.e., an administrative region of the third order, NUTS 5), metropolitan area, or country – reflecting the scalar complexity of identity. However, our study deliberately focuses on the scale of the PUR. By presenting respondents with a predefined regional name, we aimed to test whether and to what extent they relate to the PUR as "their" region. This approach allows us to examine identity and attachment at a scale that is both functionally significant and discursively constructed, while recognising that such identification may vary across individuals and contexts.

This approach ensured consistency and comparability across responses, especially in areas where multiple regional framings may coexist in public discourse. The scientific literature recognises various functions of place names. To apply this specifically to regional names, we developed a set of 11 statements that respondents rated on a scale from 1 (no agreement) to 5 (full agreement) (see Fig. 3). Based on these ratings, we conducted factor analysis with varimax rotation to identify clusters of related statements, facilitating variable reduction and interpretation. This analytical approach was substantiated by the results of the Kaiser–Meyer–Olkin (KMO) test of sampling adequacy (0.93), which confirmed the data's suitability for factor analysis, and

Table 2. Dimensions of regional identity and related statements

Dimension	Statements
Functional	F1: There are effective inter-communal initiatives/projects underway in my region. F2: My region functions as a well-organised and integrated whole. F3: My region's public services (e.g., transportation and waste management) are well-coordinated.
Strategic	S1: My region has a coherent vision and development goals for the future. S2: My region has strong potential for future development. S3: My region has a clear strategy to strengthen its position in international competition. S4: My region is positively perceived by its residents. S5: My region is positively perceived by people who do not live in it.
Cultural	C1: My region's residents share a common history and traditions. C2: My region is unique and has characteristics that distinguish it from other areas. C3: Cultural events and traditions are an important part of life in my region. C4: The cultural heritage of my region is actively promoted and preserved. C5: Residents of my region share a similar lifestyle and common values.

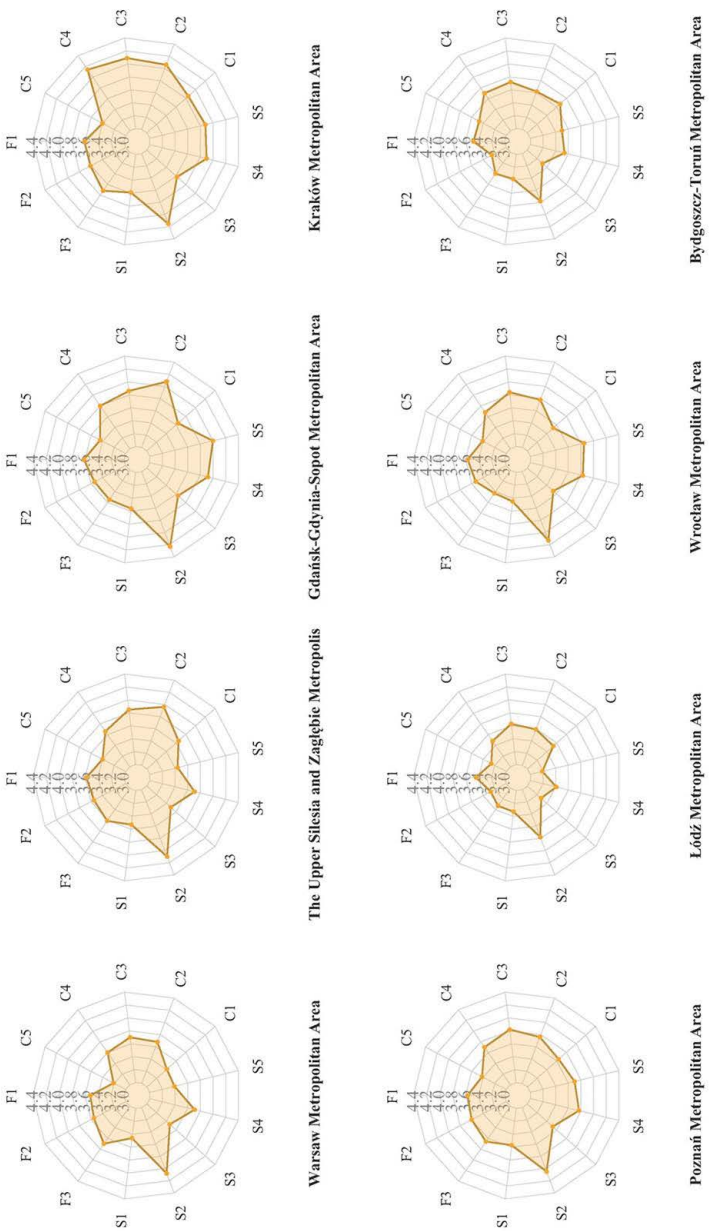

Figure 2. Average ratings of 13 statements related to regional identity in Poland's metropolitan regions (To highlight regional differences, the radar charts use a minimum value of 3 despite the 1-5 rating scale)

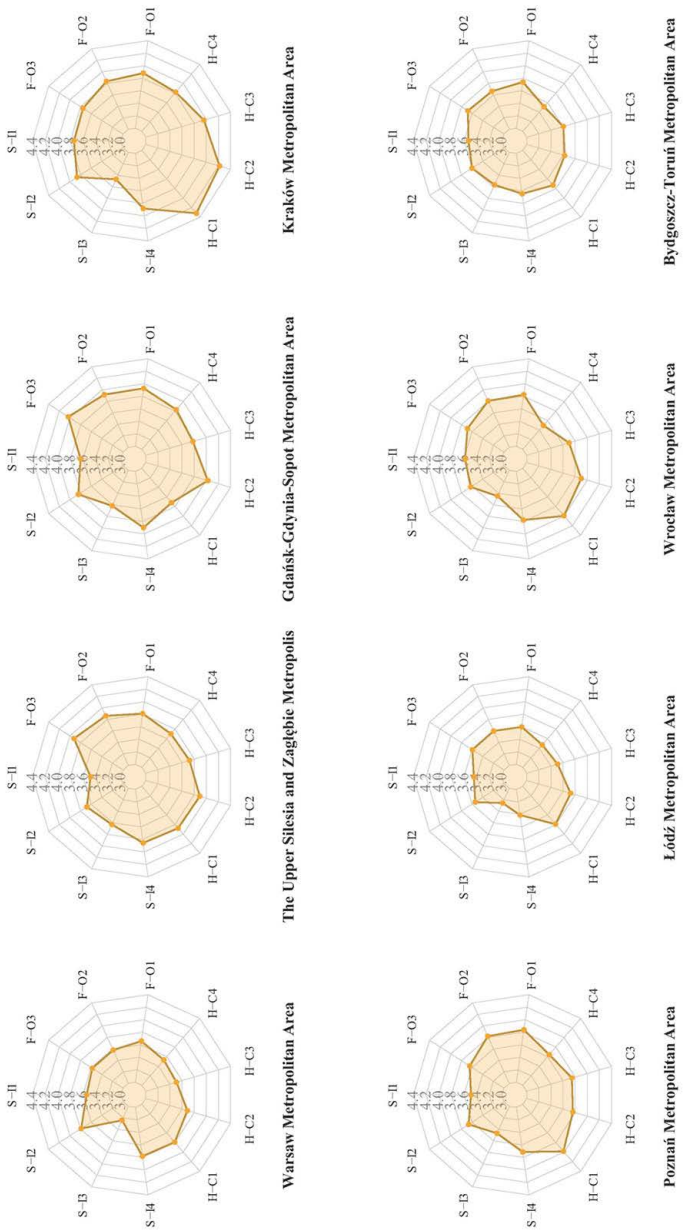

Figure 3. Average ratings of 11 statements related to names (primary data) of selected metropolitan regions (To highlight regional differences, the radar charts use a minimum value of 3 despite the 1-5 rating scale)

Bartlett's test ($p < 0.001$), indicating significant correlations among the variables that justified the reduction in dimensions. Utilising parallel analysis to determine the optimal number of factors, we arrived at three factors that together accounted for 67.1% of the total variance (see Tab. 3): functional-organisational, strategic-image, and historical-cultural aspects. We created a variable for each factor by calculating the average value of the associated statements. The reliability of these variables was confirmed through a high Cronbach's alpha coefficient ($\alpha = 0.89$).

Additionally, we also draw on the literature to propose other factors that may be significant in examining people's relationships with places. These factors include variables related to mobility, community involvement, perceptions of governance, and demographics (see Tab. 4). Some of the analysed variables required modification due to their complex structure – such as location of mobility, travel time, and regional activity – or because certain categories had few observations, including frequency of mobility, age, and number of relocations. To address this, we employed cluster analysis to group respondents with similar characteristics, facilitating a more straightforward interpretation of the data. The optimal number of clusters was determined using the elbow method (see Fig. 4).

The mobility of respondents was examined using three primary factors. The first factor addressed the frequency of mobility outside their place of residence, assessed through five response options. Due to an uneven distribution of responses, we clustered responses into three levels of mobility: low (travelling a few times a year or less), moderate (travelling a few times a month), and high (travelling daily or several times a week). The second and third factors focused on the locations of essential activities – specifically, whether these activities occurred within the municipality, within the region, or beyond – as well as the time spent commuting to these locations. Commuting time was categorised into four groups: less than 15 minutes, 15 to 30 minutes,

Table 3. Factor loadings for three identified factors

	Functional and organisational aspects	Strategic and image-related aspects	Historical and cultural aspects
F-O_1: The name of my region helps identify and organise the space.	**0.54**	0.28	0.47
F-O_2: The name of my region effectively represents the entire region by fostering cooperation among the cities and municipalities that compose it.	**0.79**	0.26	0.31
F-O_3: The name of my region effectively reflects the connections between the cities and municipalities that compose it.	**0.75**	0.24	0.33
S-O_1: The name of my region influences how the region is perceived by its residents.	0.25	**0.79**	0.27
S-O_2: The name of my region influences how the region is perceived by people who do not live in it.	0.22	**0.79**	0.28
S-O_3: The name of my region reflects the striving for common goals and visions for the future.	0.48	**0.49**	0.37
S-O_4: The name of my region reflects its development potential.	0.46	**0.47**	0.44
H-C_1: The name of my region refers to the history of the area.	0.28	0.29	**0.62**
H-C_2: The name of my region reflects its unique character.	0.34	0.30	**0.75**
H-C_3: The name of my region reinforces a sense of belonging to it.	0.50	0.33	**0.59**
H-C_4: The name of my region reinforces a sense of separateness from others.	0.42	0.32	**0.48**
Variance explained	24.1%	20.9%	22.1%

Table 4. Variable descriptions

	Variable	Categories	Proportion
Mobility	Frequency of mobility	Low mobile	49.1%
		Moderately mobile	29.0%
		Highly mobile	21.9%
	Location of mobility	Low mobile	46.5%
		Moderately mobile	39.0%
		Highly mobile	14.5%
	Travel time	Low mobile	25.3%
		Moderately mobile	53.5%
		Highly mobile	21.2%
Community involvement	Regional activity	Not active	64.5%
		Moderately active	23.7%
		Active	11.9%
	Interest and involvement in spatial planning	I am not interested in this topic.	30.8%
		Yes, I am interested but not involved in activities.	58.7%
		Yes, I am interested and involved in urban planning activities.	10.5%
Governance perception	Sense of inclusion in regional decision-making	No	34.3%
		Difficult to say	45.6%
		Yes	20.1%
	Perception of regional authorities	Regional authorities decide for themselves on important issues in the region, keep their distance from residents, treat consultations only as a formality.	37.0%
		Regional authorities respond to the needs of residents, do not introduce innovative solutions, but also do not make it difficult for residents to contact officials.	36.3%
		Regional authorities introduce innovative solutions, encourage residents to participate in social consultations and support their initiatives.	26.7%
Demographic factors	Gender	Female	53.4%
		Male	46.6%
	Age	18-39 years	38.1%
		40-58 years	33.9%
		59-92 years	27.9%
	Education	Primary	1.6%
		Basic vocational	5.8%
		Secondary	34.2%
		Higher education	58.4%
	Income per person in the household	Less than 1,500 PLN	4.7%
		From 1,500 PLN to 2,500 PLN	16.2%
		From 2,500 PLN to 4,000 PLN	36.8%
		More than 4,000 PLN	42.3%
	Type of residence area	Village	8.9%
		Suburban area	3.8%
		Small city (< 20,000 residents)	4.2%
		Medium city (20,000-100,000 residents)	14.8%
		Large city (> 100,000 residents)	68.4%

Demographic factors	Length of residence	Less than a year	4.6%
		1-5 years	19.3%
		6-10 years	11.8%
		> 10 years, but not since birth	39.1%
		Since birth	25.2%
	Type of previous residence	Village	12.0%
		Suburban area	2.7%
		Small city (< 20,000 residents)	6.8%
		Medium city (20,000-100,000 residents)	15.3%
		Large city (> 100,000 residents)	45.8%
		My family has always lived here.	17.3%
	Number of moves	No or low number of moves (from 0 to 2)	56.0%
		Moderate number of moves (from 3 to 6)	37.0%
		High number of moves (from 8 to 16)	7.0%

30 to 60 minutes, and over 60 minutes. The analysis included six distinct activities related to daily life and leisure. For both factors, consistent transformation methods were applied. Response options were assigned numerical values in ascending order, and the total sum across all activities was calculated, resulting in two separate mobility measures: one reflecting travel location and another reflecting travel time. These measures were then subjected to cluster analysis, which grouped respondents into three categories: low, medium, or high mobility.

Community involvement was assessed by examining regional activity and spatial planning interest. The question regarding regional activity provided five different forms of involvement, allowing respondents to select multiple options. One of the options specifically invited respondents to indicate a lack of involvement in regional activities. The number of chosen responses served as a measure of involvement, reflecting each respondent's level of engagement in regional activities. These data were again examined using cluster analysis, which identified three groups: inactive individuals (respondents who do not participate in regional community life), moderately active individuals (those involved in one activity), and active individuals (those engaged in two or more activities). The second factor was based on a direct question: "Are you interested in topics related to urban planning in your region?"

Governance perception was examined from two complementary perspectives: the residents' sense of inclusion in decision-making processes, assessed by the question, "Do you feel, as a resident, invited to co-determine the affairs of your region?" and the perception of regional authorities' actions, which included their approach to residents and the conduct of public consultations. And finally, the demographic analysis encompassed a variety of variables, including gender, age, education, income per person in the household, type of residential area, length of residence, type of previous residence, and number of relocations. For two of these variables – age and number of moves – a specific analytical approach was employed due to the presence of categories with single observations: we introduced categorised ranges, identifying three distinct clusters.

Multiple regression analysis with robust standard errors (HC3) was conducted to minimise potential errors arising from violations of classical multiple regression assumptions, thereby enhancing the reliability of the results. Except for gender, the values assigned to variables increased with the intensity, frequency, or degree of agreement expressed by respondents. This study employed three multiple regression analyses: one analysing the full dataset to identify general patterns, another incorporating regions as a set of dummy variables for inter-regional

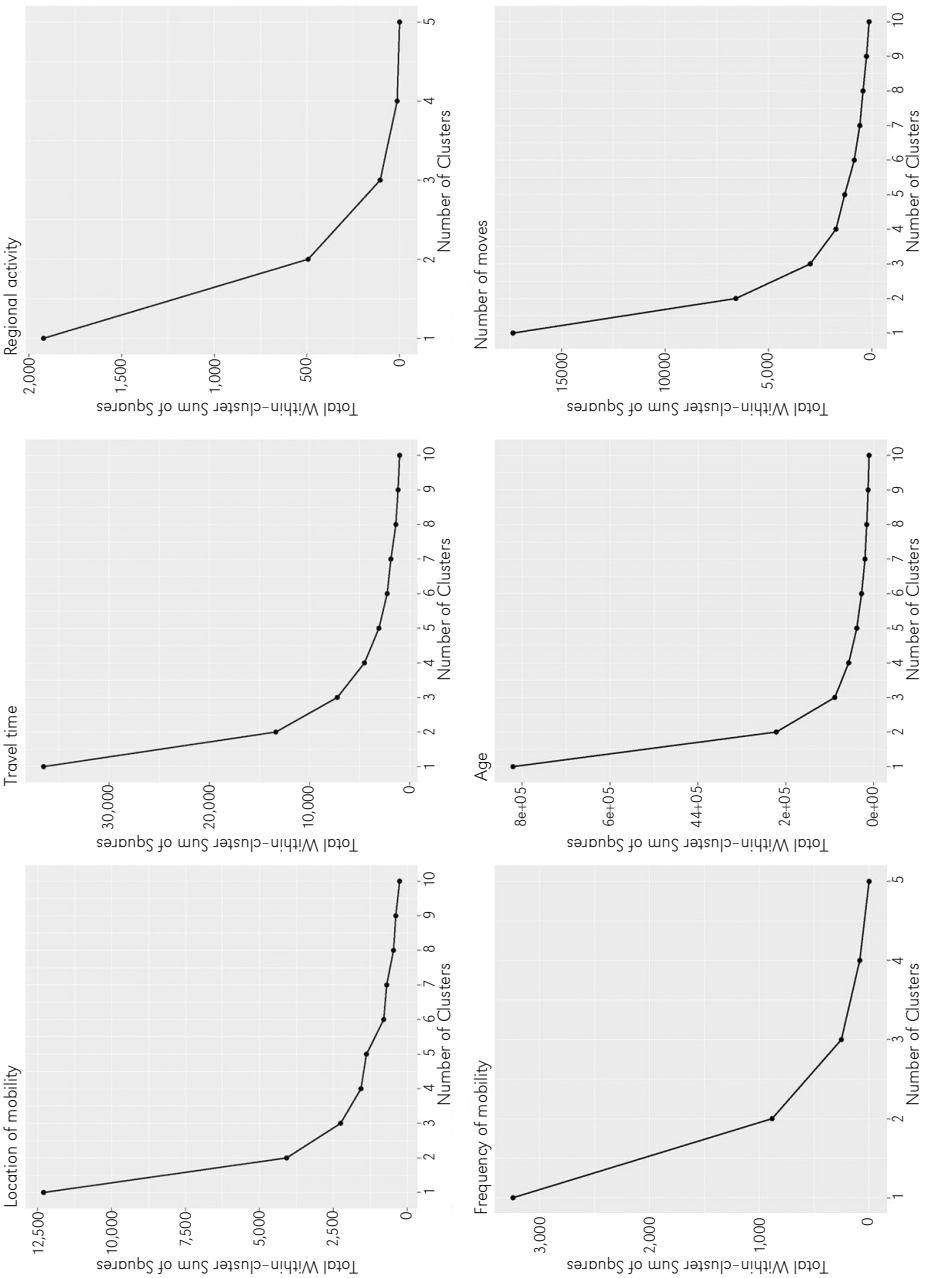

Figure 4. Elbow method charts for selection of variables in the cluster analyses

comparisons, and a third consisting of separate analyses for specific regions to capture unique regional dynamics.

Findings: assessing regional identity and attachment in PURs

General effects of name perception on regional identity and attachment

We begin our discussion of the results with a multiple regression analysis conducted on the full dataset (see Tab. 5). Concerning the perception of the name, all its aspects exhibit a statistically significant impact on both dimensions of regional identity and regional attachment. Residents who perceive the region's name as emphasising cohesion and cooperation within the region tend to identify more strongly with it on a functional level, which can be seen as consistent with intuitive expectations. The functional dimension is then most strongly influenced by the functional-organisational aspects of the name ($\beta = 0.29$, $p < 0.001$). In comparison, the impact of strategic-image aspects is less pronounced ($\beta = 0.14$, $p < 0.001$), while historical-cultural aspects have an even smaller effect ($\beta = 0.09$, $p < 0.01$). However, what is particularly notable is that these same functions also exert the strongest influence on the strategic dimension of regional identity ($\beta = 0.30$, $p < 0.001$). The effects

Table 5. Multiple linear regression with heteroskedasticity-consistent standard errors (HC3) – full dataset (significant β values)

	Dimensions of regional identity			Regional attachment
	Functional	Strategic	Cultural	
Name perception:				
Functional-organisational aspects	0.29***	0.30***	0.24***	0.26***
Strategic-image aspects	0.14***	0.11***	0.04*	0.20***
Cultural-historical aspects	0.09**	0.11***	0.29***	0.23***
Mobility:				
Frequency of mobility				
Mobility location	-0.07**	-0.07***	-0.07***	
Travel time	-0.06**			
Community involvement:				
Regional activity			0.06***	
Interest and involvement in spatial planning		0.05*	0.04*	0.13***
Governance perception:				
Sense of inclusion in regional decision-making	0.20***	0.12***	0.09***	0.13***
Perception of regional authority	0.20***	0.15***	0.09***	0.06**
Demographic factors:				
Gender	-0.07**	-0.06*	-0.06*	
Age	-0.05**			0.10***
Education				
Type of residence area			0.03**	
Income per person in the household				
Length of residence				0.06***
Type of previous residence				0.02*
Number of moves				
Key statistical notes:				
R^2	0.44	0.49	0.52	0.42
R^2_{adj}	0.44	0.48	0.52	0.41

*p < 0.05; **p < 0.01; ***p < 0.001

of strategic-image and historical-cultural aspects are nearly three times smaller ($\beta = 0.11$, $p < 0.001$ for both). This means that, contrary to what might be expected, perceiving the region as a cohesive and efficiently governed entity plays a greater role in shaping the region's development vision than purely strategic or image-related references. The formation of the cultural dimension of regional identity is based primarily on the historical and cultural references contained in the name of the region ($\beta = 0.29$, $p < 0.001$). At the same time, functional-organisational aspects exert a somewhat weaker impact ($\beta = 0.24$, $p < 0.001$). From this perspective, the name functions both as a binding element tied to a shared past and as an essential point of reference for emphasising the region's unique cultural attributes. Although the impact of individual aspects on the dimensions of regional identity varies, regional attachment proved to be multidimensional and responsive to all analysed aspects of the name, with sizable and statistically significant effects noted for functional-organisational aspects ($\beta = 0.26$), historical-cultural aspects ($\beta = 0.23$), and strategic-image aspects ($\beta = 0.20$), all with $p < 0.001$.

Furthermore, factors associated with the perception of governance also emerge as significant predictors, notably reinforcing functional identity ($\beta = 0.20$, $p < 0.001$). While many other variables display statistical significance, the magnitude of their effects is comparatively minor.

Interregional comparison of Polish PURs

Having examined the overall patterns, we now focus on the interregional comparison, demonstrating distinct patterns in regional identity and regional attachment (see Tab. 6).

Residents of Warsaw, Poznań and Kraków metropolitan areas demonstrate a significantly stronger functional identity than other regions. However, there are no statistically significant differences among residents of these three areas. When considering Warsaw as the reference point, residents from this metropolitan area exhibit notably higher values of functional identity than those from the Bydgoszcz–Toruń Metropolitan Area ($\beta = -0.27$, $p < 0.001$) and the Łódź Metropolitan Area ($\beta = -0.22$, $p < 0.001$). Smaller, yet still significant, differences are observed in the Gdańsk–Gdynia–Sopot Metropolitan

Table 6. Multiple linear regression with heteroskedasticity-consistent standard errors (HC3) – full dataset with regions as a set of dummy variables (only significant β values are shown)

	Warsaw Metropolitan Area				The Upper Silesia and Zagłębie Metropolis			
	Dimensions of regional identity			Regional attachment	Dimensions of regional identity			Regional attachment
	Functional	Strategic	Cultural		Functional	Strategic	Cultural	
Warsaw Metropolitan Area					0.07*		-0.09**	
The Upper Silesia and Zagłębie Metropolis	-0.07*		0.09**					
Gdańsk–Gdynia–Sopot Metropolitan Area	-0.14**	0.14***	0.13***	0.12*		0.18***		0.13*
Kraków Metropolitan Area		0.11*	0.21***			0.14**	0.13**	
Poznań Metropolitan Area			0.09*	0.14*		0.11*		0.15*
Łódź Metropolitan Area	-0.22***	-0.21***			-0.15**	-0.17***	-0.11*	
Wrocław Metropolitan Area	-0.14**	0.09*				0.13**		
Bydgoszcz–Toruń Metropolitan Area	-0.27***	-0.15***			-0.20***	-0.12*		
R2	0.45	0.50	0.52	0.42	0.45	0.50	0.52	0.42
$R2_{adj}$	0.44	0.50	0.52	0.41	0.44	0.50	0.52	0.41

	Gdańsk–Gdynia–Sopot Metropolitan Area				Kraków Metropolitan Area			
	Dimensions of regional identity			Regional attachment	Dimensions of regional identity			Regional attachment
	Functional	Strategic	Cultural		Functional	Strategic	Cultural	
Warsaw Metropolitan Area	0.14**	-0.14***	-0.13***	-0.12*		-0.11*	-0.21***	
The Upper Silesia and Zagłębie Metropolis		-0.18***		-0.13*		-0.14**	-0.13**	
Gdańsk–Gdynia–Sopot Metropolitan Area								
Kraków Metropolitan Area							-0.12*	
Poznań Metropolitan Area		-0.35***	-0.15**		-0.17**	-0.31***	-0.23***	
Łódź Metropolitan Area							-0.17**	
Wrocław Metropolitan Area								
Bydgoszcz–Toruń Metropolitan Area	-0.14*	-0.30***		-0.16*	-0.22***	-0.26***	-0.15**	
R2	0.45	0.50	0.52	0.42	0.45	0.50	0.52	0.42
$R2_{adj}$	0.44	0.50	0.52	0.41	0.44	0.50	0.52	0.41
	Poznań Metropolitan Area				Łódź Metropolitan Area			
	Dimensions of regional identity			Regional attachment	Dimensions of regional identity			Regional attachment
	Functional	Strategic	Cultural		Functional	Strategic	Cultural	
Warsaw Metropolitan Area			-0.09*	-0.14*	0.22***	0.21***		
The Upper Silesia and Zagłębie Metropolis		-0.11*		-0.15*	0.15**	0.17***	0.11*	
Gdańsk–Gdynia–Sopot Metropolitan Area						0.35***	0.15**	
Kraków Metropolitan Area			0.12*		0.17**	0.31***	0.23***	
Poznań Metropolitan Area					0.20***	0.28***	0.11*	
Łódź Metropolitan Area	-0.20***	-0.28***	-0.11*					
Wrocław Metropolitan Area					0.17**	0.31***	0.23***	
Bydgoszcz–Toruń Metropolitan Area	-0.25***	-0.23***		-0.19*				
R2	0.45	0.50	0.52	0.42	0.45	0.50	0.52	0.42
$R2_{adjj}$	0.44	0.50	0.52	0.41	0.44	0.50	0.52	0.41
	Wrocław Metropolitan Area				Bydgoszcz–Toruń Metropolitan Area			
	Dimensions of regional identity			Regional attachment	Dimensions of regional identity			Regional attachment
	Functional	Strategic	Cultural		Functional	Strategic	Cultural	
Warsaw Metropolitan Area	0.14**	-0.09*			0.27***	0.15***		
The Upper Silesia and Zagłębie Metropolis		-0.13**			0.20***	0.12*		
Gdańsk–Gdynia–Sopot Metropolitan Area					0.14*	0.30***		0.16*
Kraków Metropolitan Area			0.17**		0.22***	0.26***	0.15**	
Poznań Metropolitan Area					0.25***	0.23***		0.19*
Łódź Metropolitan Area		-0.30***						
Wrocław Metropolitan Area					0.13*	0.24***		
Bydgoszcz–Toruń Metropolitan Area	-0.13*	-0.24***						
R2	0.45	0.50	0.52	0.42	0.45	0.50	0.52	0.42
$R2_{adj}$	0.44	0.50	0.52	0.41	0.44	0.50	0.52	0.41

*p < 0.05; **p < 0.01; ***p < 0.001

Explanation: The effect of regional variables, represented as dummy variables, was controlled by simultaneously including other factors related to name perception, mobility, social activity, perception of authority, and demography. Given the consistency of the results for the control variables across all regions and the focus on inter-regional comparisons, these variables were not included in the table.

Area and the Wrocław Metropolitan Area (β = -0.14, $p < 0.01$ for both). The least pronounced differences occur in relation to the Upper Silesia and Zagłębie Metropolis (β = -0.07, $p < 0.05$).

In terms of the strategic dimension, regional identity scores are highest in the metropolitan areas of Gdańsk–Gdynia–Sopot, Kraków, Poznań, and Wrocław. When comparing these areas to the Gdańsk–Gdynia–Sopot Metropolitan Area, scores for the strategic dimension of the regional identity are lowest in the Łódź Metropolitan Area (β = -0.35, $p < 0.001$) and the Bydgoszcz–Toruń Metropolitan Area (β = -0.30, $p < 0.001$). More modest differences are noted in relation to the Upper Silesia and Zagłębie Metropolis (β = -0.18, $p < 0.001$) and the Warsaw Metropolitan Area (β = -0.14, $p < 0.001$).

When examining the cultural dimension, the Kraków Metropolitan Area distinguishes itself significantly, attaining higher scores than most other regions except for the Gdańsk–Gdynia–Sopot Metropolitan Area, where the differences are not statistically significant. The most substantial disparities are observed in comparison to the Łódź Metropolitan Area (β = -0.23, $p < 0.001$) and the Warsaw Metropolitan Area (β = -0.21, $p < 0.001$). More modest differences are noted relative to the Wrocław Metropolitan Area (β = -0.17, $p < 0.01$), the Bydgoszcz–Toruń Metropolitan Area (β = -0.15, $p < 0.01$), and the Upper Silesia and Zagłębie Metropolis (β = -0.13, $p < 0.01$). The least significant differences are found compared to the Poznań Metropolitan Area (β = -0.12, $p < 0.05$).

Regional attachment demonstrates less variation overall; however, apparent differences between certain regions can still be observed. The metropolitan areas of Poznań and Gdańsk–Gdynia–Sopot achieve the highest scores, significantly differing from the Bydgoszcz–Toruń Metropolitan Area (β = -0.19, $p < 0.05$ and β = -0.16, $p < 0.05$, respectively), as well as the Upper Silesia and Zagłębie Metropolis (β = -0.15, $p < 0.05$ and β = -0.13, $p < 0.05$, respectively), and the Warsaw Metropolitan Area (β = -0.14, $p < 0.05$ and β = -0.12, $p < 0.05$, respectively). The metropolitan areas of Kraków, Wrocław, and Łódź do not exhibit statistically significant differences compared to other regions, positioning them in an intermediate range between those with the highest and lowest values of regional attachment.

The regional identity and attachment declared by residents vary significantly across different regions. Some of the regions studied stand out. Residents of the Warsaw Metropolitan Area report the highest sense of functional identity, which can be attributed to Warsaw's leading role as the country's capital, which is distinguished from other Polish cities by its concentration of key metropolitan functions (Gorzelak et al., 2009). At the same time, compared to other regions, the cultural identity in this area remains relatively low, which may result from the modern, reconstructed character of the city, where traditional historical elements play a less prominent role. The Kraków Metropolitan Area not only stands out in terms of high functional and strategic identity but, above all, displays the strongest cultural identity among all regions. These findings confirm Kraków's long-standing role as a national cultural centre and the deliberate use of historical heritage in shaping its contemporary urban identity (Drożdż & Drąg, 2021). The Gdańsk–Gdynia–Sopot Metropolitan Area also scores highly in both the strategic and cultural dimensions of regional identity. These results may be explained by the region's effective promotion, its clear focus on innovation and competitiveness, and the recognition that it possesses the most significant cultural capital in Northern Poland (*Development Strategy of the Gdańsk–Gdynia–Sopot Metropolitan Area 2030*).

Conversely, the Łódź Metropolitan Area stands out with the lowest scores across all examined dimensions of regional identity. This region continues to struggle with persistent negative stereotypes in public perception. This is reflected in the image of Łódź, the region's main city, whose image remains shaped by its textile-industry heritage and a perceived lack of development prospects

(Sokołowicz & Boryczka, 2010). Owing to its rapid development rooted in industrial functions rather than historical continuity, Łódź does not exhibit established regional traditions or cultural specificity (Rembowska, 2002). Despite ongoing revitalisation efforts and initiatives aimed at promoting local heritage, it is often perceived as a "dysfunctional, unattractive center, both in terms of investment and tourism" (*Development Strategy of the Łódź Metropolitan Area 2020+*: 135). Similarly, the Bydgoszcz–Toruń Metropolitan Area is characterised by comparatively low regional identity values. It is distinguished by a specific dynamic of cooperation and competition between its two main urban centres – Bydgoszcz and Toruń – and lacks a stable territorial definition and a coherent vision (Szmytkowska et al., 2022). These conditions may represent a key factor explaining the weak sense of regional identity observed among its residents.

Place-based determinants of regional identity and attachment

We begin the analysis of the subset data (see Tab. 7) by examining the relationships between name perception and the dimensions of regional identity. This supports the findings from the comprehensive dataset, indicating that functional-organisational aspects primarily influence the functional and strategic dimensions, while historical-cultural aspects shape the cultural dimension. However, notable exceptions to this pattern emerge in specific regions. In the metropolitan regions of Kraków and Wrocław, it is the strategic-image aspects, rather than functional-organisational aspects, that exert the most substantial impact on the functional dimension ($\beta = 0.27$, $p < 0.01$ and $\beta = 0.21$, $p < 0.01$, respectively). In the Gdańsk–Gdynia–Sopot Metropolitan Area, both functional-organisational and strategic-image aspects have an equally pronounced influence on the strategic dimension ($\beta = 0.22$, $p < 0.01$). In the cultural dimension, within the Upper Silesia and Zagłębie Metropolis, the primary influence stems from functional-organisational aspects ($\beta = 0.32$, $p < 0.001$). However, historical-cultural aspects also remain significant ($\beta = 0.29$, $p < 0.001$). Conversely, in the Wrocław Metropolitan Area, the impact is confined to functional-organisational and strategic-image aspects ($\beta = 0.21$ and $\beta = 0.18$, $p < 0.05$, respectively), with historical-cultural aspects showing no significant effect.

The subset data analysis reveals significant variation in the impact on regional attachment across different areas. Functional-organisational aspects influence regional attachment in the Upper Silesia and Zagłębie Metropolis, Łódź Metropolitan Area, and Kraków Metropolitan Area, with respective β values of 0.41 ($p < 0.001$), 0.35 ($p < 0.01$), and 0.31 ($p < 0.01$). Conversely, strategic-image aspects play a crucial role in shaping regional attachment in the Bydgoszcz–Toruń and Tri-City (Gdańsk–Gdynia–Sopot) metropolitan areas, with β values of 0.47 and 0.31 ($p < 0.01$ for both). In the Warsaw Metropolitan Area, both functional-organisational aspects ($\beta = 0.23$, $p < 0.001$) and historical-cultural aspects ($\beta = 0.31$, $p < 0.001$) demonstrate significant influence. In the metropolitan areas of Poznań and Wrocław, regional attachment among residents is shaped by strategic-image aspects ($\beta = 0.30$, $p < 0.01$ and $\beta = 0.23$, $p < 0.05$, respectively), as well as historical-cultural aspects ($\beta = 0.30$, $p < 0.05$ and $\beta = 0.40$, $p < 0.01$, respectively).

Regarding mobility-related factors, the results indicate that location and travel time generally negatively impact all dimensions of identity, consistent with the findings from the full dataset. However, the statistical significance of these impacts is less pronounced in the subset data analysis. Despite the overall negative influence, the location of travel emerges as a significant predictor of regional attachment in the Kraków Metropolitan Area, with a β value of 0.33 ($p < 0.01$).

In the context of community involvement, these factors tend to have a minor impact on both identity and regional attachment. However, interest and involvement in spatial planning significantly influence regional attachment in

Table 7a. Multiple linear regression with heteroskedasticity-consistent standard errors (HC3) – analysis on data subsets (significant β values)

	Warsaw Metropolitan Area, N=770				The Upper Silesia and Zagłębie Metropolis, N=646			
	Dimensions of regional identity			Regional attachment	Dimensions of regional identity			Regional attachment
	Functional	Strategic	Cultural		Functional	Strategic	Cultural	
Name perception:								
Functional-organizational aspects	0.31***	0.31***	0.25***	0.23***	0.31***	0.30***	0.32***	0.41***
Strategic-image aspects	0.10*	0.08*			0.13*	0.13**		0.18*
Cultural-historical aspects		0.10*	0.30***	0.31***	0.13*	0.13**	0.29***	
Mobility:								
Frequency of mobility								
Mobility location	-0.10*	-0.12**	-0.09*		-0.12**	-0.09*	-0.09*	
Travel time	-0.08*							
Community involvement:								
Regional activity							0.07*	
Interest and involvement in spatial planning								
Governance perception:								
Sense of Inclusion in Regional Decision-Making	0.17***	0.14***	0.11**	0.15**	0.22***	0.12**	0.09**	
Perception of regional authority	0.20***	0.14***			0.15***	0.09**	0.06*	
Demographic Factors:								
Gender								
Age	-0.10**						-0.09**	
Education								
Type of place of residence	0.07**							
Income per person in the household						0.07*	0.06*	
Period of residence								0.10*
Type of previous place of residence								0.05**
Number of moves								
R2	0.43	0.51	0.51	0.37	0.52	0.55	0.60	0.45
$R2_{adj}$	0.41	0.49	0.50	0.36	0.50	0.54	0.59	0.43

*p<.05; **p<.01; ***p<.001

the Gdańsk–Gdynia–Sopot Metropolitan Area ($\beta = 0.31$, $p < 0.01$) and the functional dimension of identity in the Poznań Metropolitan Area ($\beta = 0.26$, $p < 0.001$).

Governance perception factors exert the most substantial impact on the functional dimension of identity, with specific factors playing a dominant role across different regions. In the metropolitan areas of Kraków ($\beta = 0.32$, $p < 0.001$), Gdańsk–Gdynia–Sopot ($\beta = 0.26$, $p < 0.001$), and Upper Silesia and Zagłębie ($\beta = 0.22$, $p < 0.001$), the sense of inclusion in decision-making processes is the key determinant. In contrast, in the metropolitan areas of Poznań ($\beta = 0.32$, $p < 0.001$), Łódź ($\beta = 0.25$, $p < 0.001$), Bydgoszcz–Toruń ($\beta = 0.21$, $p < 0.01$), Warsaw ($\beta = 0.20$, $p < 0.001$), and Wrocław ($\beta = 0.20$, $p < 0.01$), the perception of regional authorities takes precedence. While present, the influence of these factors on the

Table 7b. Multiple linear regression with heteroskedasticity-consistent standard errors (HC3) – analysis on data subsets (significant β values)

	Kraków Metropolitan Area, N=271				Łódź Metropolitan Area, N=283			
	Dimensions of regional identity			Regional attach-ment	Dimensions of regional identity			Regional attach-ment
	Functional	Strategic	Cultural		Functional	Strategic	Cultural	
Name perception:								
Functional-organizational aspects	0.22*	0.27***	0.25**	0.31**	0.28**	0.27***	0.17*	0.35**
Strategic-image aspects	0.27**							
Cultural-historical aspects			0.31***				0.30***	
Mobility:								
Frequency of mobility								
Mobility location				0.33**				
Travel time								
Community involvement:								
Regional activity								
Interest and involvement in spatial planning								
Governance perception:								
Sense of Inclusion in Regional Decision-Making	0.32***	0.16*			0.18*			
Perception of regional authority		0.15*	0.12*		0.25***	0.24***	0.11*	
Demographic Factors:								
Gender					-0.25**	-0.22**	-0.27***	
Age								
Education					-0.08**	-0.13*	-0.15*	-0.19*
Type of place of residence								
Income per person in the household								
Period of residence								0.18***
Type of previous place of residence								0.07*
Number of moves								
R2	0.45	0.54	0.58	0.54	0.46	0.48	0.48	0.48
$R2_{adj}$	0.41	0.50	0.54	0.50	0.42	0.44	0.44	0.44

*p<.05; **p<.01; ***p<.001

other dimensions of identity is considerably weaker. Regarding their impact on regional attachment, only the sense of inclusion in decision-making processes shows a statistically significant effect, which is observed only in the metropolitan areas of Warsaw ($\beta = 0.15$, $p < 0.01$) and Poznań ($\beta = 0.19$, $p < 0.05$).

The impact of demographic factors is inconsistent, making it difficult to identify general patterns and suggesting their dependence on unique regional contexts. For instance, gender exhibits a distinctly negative effect on regional identity, but this is limited to the metropolitan areas of Wrocław and Łódź, with β values of -0.27 and -0.25 ($p < 0.01$) for the functional dimension; -0.25 and -0.22 ($p < 0.01$) for the strategic dimension; and -0.30 and -0.27 ($p < 0.001$) for the cultural dimension. Additionally, the influence of demographic factors is often contradictory; the same variable may

Table 7c. Multiple linear regression with heteroskedasticity-consistent standard errors (HC3) – analysis on data subsets (significant β values)

	Poznań Metropolitan Area, N=286				Gdańsk-Gdynia-Sopot Metropolitan Area, N=351			
	Dimensions of regional identity			Regional attachment	Dimensions of regional identity			Regional attachment
	Functional	Strategic	Cultural		Functional	Strategic	Cultural	
Name perception:								
Functional-organizational aspects	0.38***	0.33***			0.27**	0.22**	0.14*	
Strategic-image aspects				0.30**	0.20*	0.22**	0.20***	0.31**
Cultural-historical aspects			0.29***	0.30*			0.24***	
Mobility:								
Frequency of mobility								
Mobility location								
Travel time								
Community involvement:								
Regional activity								
Interest and involvement in spatial planning	0.26***							0.31**
Governance perception:								
Sense of Inclusion in Regional Decision-Making				0.19*	0.26***			
Perception of regional authority	0.32***	0.25**	0.19*		0.22***	0.22***	0.13*	
Demographic Factors:								
Gender								
Age				0.16*				
Education								
Type of place of residence						0.06*	0.06*	
Income per person in the household								
Period of residence								
Type of previous place of residence								
Number of moves								
R2	0.45	0.45	0.45	0.47	0.43	0.46	0.52	0.44
$R2_{adj}$	0.41	0.41	0.41	0.43	0.39	0.43	0.49	0.40

*p<.05; **p<.01; ***p<.001

strengthen one aspect while simultaneously weakening another, as seen with age. However, with a few exceptions, the overall impact of demographic factors remains relatively minor.

Conclusions

The name of a region – often regarded as a purely administrative element – actually fulfils an important social function. For residents, it becomes a symbolic bearer of meanings, interpreted through the prism of their own experiences, emotions, and perceptions of the region. This leads to a situation in which the regional community finds, within the name, functions that are not always expressed directly. As a result, regional names operate in the consciousness of the residents as terms with an additional, socially constructed semantic scope.

Table 7d. Multiple linear regression with heteroskedasticity-consistent standard errors (HC3) – analysis on data subsets (significant β values)

	Wrocław Metropolitan Area, N=250				Bydgoszcz-Toruń Metropolitan Area, N=227			
	Dimensions of regional identity			Regional attach-ment	Dimensions of regional identity			Regional attach-ment
	Functional	Strategic	Cultural		Functional	Strategic	Cultural	
Name perception:								
Functional-organizational aspects	0.20*	0.24***	0.21*		0.38***	0.36***	0.26**	
Strategic-image aspects	0.21**	0.18**	0.18*	0.23*				0.47**
Cultural-historical aspects				0.40**		0.25**	0.27**	
Mobility:								
Frequency of mobility						0.14*		
Mobility location	-0.14*				-0.16*			
Travel time								
Community involvement:								
Regional activity		0.12*	0.14*					
Interest and involvement in spatial planning								
Governance perception:								
Sense of Inclusion in Regional Decision-Making	0.18*		0.21**					
Perception of regional authority	0.20**				0.21**	0.16*	0.16**	
Demographic Factors:								
Gender	-0.27**	-0.25**	-0.30***					
Age						0.15**		
Education					-0.25**			
Type of place of residence								
Income per person in the household								
Period of residence	-0.15**	-0.10**	-0.08*					
Type of previous place of residence							-0.05*	
Number of moves	-0.16*							
R2	0.59	0.59	0.59	0.46	0.55	0.60	0.62	0.48
$R2_{adj}$	0.55	0.55	0.55	0.41	0.51	0.56	0.58	0.43

*p<.05; **p<.01; ***p<.001

The results indicate that a more positive perception of regional names, expressed through attributing them to specific functions, is associated with stronger regional identity and attachment. This relationship remains statistically significant even after accounting for control variables. The regression model, therefore, confirms that the perception of a region's name contributes an independent and significant input in explaining the variability in the formation of residents' relationships with the region. The three groups of functions attributed to the names, as identified in the study, allowed for the observation of patterns indicating the extent to which these groups assigned to regional names affect the explained variables, thereby enabling the determination of their greater or lesser explanatory value. As a result, each group of functions contributes uniquely to explaining

the variability of these relationships, demonstrating that interacting factors shape them.

In our study, we focused on regions in Poland, examining how regional identity and attachment vary across them and exploring the factors influencing these relationships. Although these factors to some extent reflect general patterns, their strength and statistical significance vary across different regional contexts. A factor that may be decisive in fostering identity and attachment in one area may be only supplementary or marginal in another. Similarly, regions with higher scores do not exhibit consistent patterns that would clearly explain these outcomes, and higher results in one dimension do not necessarily correspond to equally high values in others. This suggests that the development of regional identity and attachment is shaped by a unique set of factors whose influence is specific to each region.

Regional integration, when considered in the context of residents' identity-based and emotional ties to a region, emerges as a complex process in which the region's name takes on particular significance. On the one hand, our findings confirm that the functions attributed to the name significantly influence how individuals perceive and form bonds with the region. On the other hand, the results suggest that constructing narratives around the region's name can effectively reinforce these relationships. In the context of PURs, where formal institutional cooperation often precedes the development of identity and emotional bonds, the role of the name becomes crucial. The absence of a recognisable and socially accepted name can weaken the region's integrative potential and hinder the establishment of lasting frameworks for cooperation. The findings, therefore, also have practical implications. From the perspective of regional policy, the region's name should be treated as a symbolic resource which, when correctly identified and consistently employed in planning activities, can support the process of shaping regional identity and emotional attachment among residents. In this sense, the name of the region can function as a factor conditioning the social reception and legitimacy of actions undertaken at the regional level. Consequently, the region's name – serving as a vessel for shared values and collective imagery – becomes a key element in fostering internal regional cohesion.

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