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Five Subnational Trends in Media Development in Mexico

Cinco tendencias subnacionales del desarrollo mediático en México

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ABSTRACT

The objective of this article is to evaluate media development in Mexico using the subnational logic to understand the differences between regions and states. The methodology is based on the analysis of the principal components and clusters to study 23 variables theoretically linked in the 32 states of the country. The results allow identifying five clusters; each group presents internal similarities from their social and media context and notable dissimilarities from the rest of the clusters. The central contribution is to describe the differences in which some indicators of media development are presented in several regional contexts of the country. In conclusion, the progress made formulating an evaluative model for Mexico is highlighted, and the limitations of the metrics used are recognized. The production of specialized statistics in the future is desirable.

Keywords: 1. media development, 2. democratic development, 3. public communication, 4. subnational studies, 5. Mexico.

RESUMEN

El objetivo de este artículo es evaluar el desarrollo mediático en México mediante una lógica subnacional, para entender las diferencias entre regiones y estados. La metodología se basa en el análisis de componentes principales y de conglomerados para estudiar 23 variables teóricamente enlazadas en los 32 estados del país. Los resultados permiten identificar cinco conglomerados, en los cuales se agrupan estados con similitudes internas respecto de su contexto social y mediático, y disimilitudes notables con el resto de los conglomerados. El aporte principal consiste en describir la manera diferenciada en la que algunos indicadores del desarrollo mediático se presentan en diversos contextos regionales del país. Como conclusión se destaca el avance en la formulación de un modelo evaluativo para México, y se reconocen las limitaciones de las métricas aquí utilizadas, siendo deseable la producción de estadística especializada en el futuro.

Palabras clave: 1. desarrollo mediático, 2. desarrollo democrático, 3. comunicación pública, 4. estudios subnacionales, 5. México.

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INTRODUCTION

The approach of media development

The goal of this work is to approach, in an exploratory manner, to a schema to assess the conditions of media development in Mexican federated states. The starting supposition is that conditions for media development may be observed through the characteristics of public communication, among which one finds the diversity and force of public debates in society, freedom of press, the plurality of social and political projects expressed in communication media, among others, as well as the links between people and citizen participation.

In this article, the results of a research carried out in Mexico on the association between indexes of welfare, development and the characteristics of public communication in the 32 federated states in Mexico are presented. Measures produced from various statistical instruments were resorted to, under the hypothesis that puts forward the presence of associative features between media communication and social development. As a result, we identified five clusters of entities after two analyses, one of principal components and the other, clusters.

For their part, the differentiated characteristics of the five clusters suggest considering a subnational logic to understand these five large tendencies, regarding differences at state (provincial) level in the advancement —or delay— in the instauration of full democracy due to their own historicity and sociopolitical context (Augusto, Dargent, & Rousseau, 2017; Pino, 2017; Ríos & Soto, 2017; Rodríguez-Albor et al., 2016; Suárez-Cao et al., 2017).

For the formulation of the study, we resorted to media development as a conceptual tool that helps establish the theoretical link between regional development, in terms of welfare, and the consolidation of democracy (DeLeón-Vázquez & De la O, 2021; UNESCO, 2010) with the characteristics of the public communication system (Demers & Lavigne, 2007), as detailed later in the text.

The Sustainable Development Agenda (Organización de las Naciones Unidas, 2015), conceived to solve the most pressing problems of inequality in the world, has served as a guide to design national public policies. In the academic sphere of communication, this becomes discussions about the way communicational practices might contribute to sustainable social development (Padilla, DeLeón-Vázquez, & Medina, 2019). In the face of the existing sides, in this work we will position on that of media development.

Media development is a notion proposed to designate the relation between the inhabitants' welfare level, democratic advance, and the strengthening of the communication media system in a country. The supposition is that the characteristics of media activity enable assessing the respect to the right to and liberty of information and communication, which is associated with the consolidation of democratic processes and a better quality of life (Garro-Rojas, Solís, & Cordero, 2021).

Despite media development, as a concept, is related to the general characteristics of a Nation-State (UNESCO, 2010), the elements it comprises are not uniform in the country. In Mexico, there are states where the media systems operate coopted by political elites and local authoritarianism dynamics, in comparison with other states where a freer exercise of journalism, accountability, public denounce and other practices associated to the sphere of media are possible (González & Echeverría, 2017). Due to the above, we consider it relevant to differentiate the characteristics present in the federated states and account for the way this phenomenon takes place at a subnational scale.

Furthermore, it is necessary to point out that the notion of media development is debated. Its most disseminated meaning is as defined by UNESCO (2010), as a result of the measurement of 150 indices in five categories: regulatory juridical system, property, democratic discourse, professionalization of communicators, and technologic infrastructure. The above suggests that media development is revealed by assessing the material, legal, and human conditions associated to dispositions for plurality, diversity, equality, and independence of communications.

UNESCO's proposal is not the only idea about media development; the discussion is still open. DeLeón-Vázquez and De la O (2021) carried out a systematic review of conceptual formulations of media development and identified four large approaches. The first comes from UN's Agenda for Sustainable Development, from which UNESCO's proposal comes. The second is framed into a critical stance toward development, considering it a vision imposed by the global north; this approach is supported by Latin American and African authors who reassert the term from a decolonial standpoint. The third is the comparative international analysis of media systems, a research trend that enables identifying similarities and differences in the ways media activity is managed in various countries. The fourth is the sectorial approach, in which media development designates the growth of media industry as economic sector, technologic advance and the impact of the property schemas of media firms.

DeLeón-Vázquez and De la O (2021), concurring with Berger (2010), state that media development is an inaccurate notion because sometimes it is seen as the process whereby media systems improve, while others, it is considered the ideal state of development that can be attained. Berger (2010) identified this dual condition —process and state— upon which we base to put forward the general goal of this research as the search for an assessment model of media development in Mexico, keeping a balance between a qualitative approach that allows establishing an evaluative metric (media development as a process), and at once, understanding the contexts of the regions' development (media development as a goal or state).

In this sense, we take the aspects that articulate a number of stances on media development. In such manner that, for the purpose of this research, it will be understood as the strengthening of the set of local schemas or broadcasting, access to information and communications technology, digital network coverage, freedoms and rights associated with information and communication, regulations on the media and telecommunications sector, the quality of contents that circulate in the communication media, accountability, and related aspects.

Linking all these elements together is possible by means of statistical approximation, using several public-access instruments, tabulated by federated state, concurring in time, and which offer measurements of elements we consider theoretically linked because of the notion of media development.

For our purposes, we have organized this document as follows: in the first section, we present the background of media development; in second, the theoretical proposals regarding media development and public communication are proposed. In the third section, the methodologic strategy is presented. And, in the final section, the results and conclusions are offered.

BACKGROUND

Formulations about media development and public communication

In this section, we display in a summarized manner the conceptual considerations about media development and public communication. The documental revision carried out by DeLeón-Vázquez and De la O (2021) considers seven theoretical standpoints from which seven discussions on media development articulate. The first standpoint is communication for development and social change from Latin America, which is related to the community, in which communication tools are used for favoring a positive change by means of dialogic participation, at once research-action strategies are unfolded to produce knowledge that nourishes the very process of the communities' progress (Barranquero-Carretero & Sáez-Baeza, 2015; Beltrán, 2008; Fuentes Navarro, 2005; Tufte, 2015).

The second, according to DeLeón-Vázquez and De la O (2021), corresponds to the comparative analysis of media systems, which carry the mark of social, political, economic, and cultural contexts where they appear (Hallin & Mancini, 2004, 2012; Rodny-Gumede, 2015). The third perspective is journalism studies, where there is marked interest in freedom of expression as regards democratic practices; an aspect linked to the development of the media and civil rights (Lugo-Ocando, 2018; Nygren, 2015; Relly & Zanger, 2017).

The next theoretical orientation, according to the review carried out by DeLeón-Vázquez and De la O (2021), is that of information and communications technology for development, in which the processes of technology appropriation as well as the citizens' digital literacy are identified as factors for the advancement in the solution of problems and attention of social needs (Drulă, 2015; Lee, 2011; Marín-Gutiérrez, Díaz-Pareja, & Aguaded, 2013; Padilla & Medina, 2018; Sein et al., 2019). The fifth perspective found by the authors is the economic-industrial, which analyzes the economic and industrial sector of media and their growth; in this approach, the conditions of entrepreneurial competence and the growth of the sector before the trends to concentrate media property in their various modalities are problematized (Arroyo, 2015; Checa-Godoy, 1998; Huerta & Becerra, 2016; Suing et al., 2016).

In the sixth place, the authors recognize the context of indices of media development by UNESCO (2010), which we previously commented in the introduction. Finally, the seventh approach identified by DeLeón-Vázquez and De la O (2021) is that of the World Association for

Christian Communication, WACC, which consists of a welfare practice, through which it seeks to reduce inequalities and marginalization (Lee, 2018).

Public communication, for its part, is a concept with an integral approach to the interactions of actors in public spaces in a democratic context, where media institutions and digital networks are fundamental to bring society projects to light. Public communication refers to topics and debates that circulate in the public space. It involves journalists who produce information with professional parameters and filter debates, but also the reactions to all that information from the citizens and social, economic, and political actors (Demers, 2008).

If the problem of the notion of media development expressed by Berger (2010) on the ambivalence of the term as a process and state is considered, it is noticed that something similar occurs with public communication due to its polysemy. As a first meaning, public communication may be considered the communication between governments and citizens, which is a requirement for accountability. In this sense, the government is responsible for creating communication strategies to inform the citizens about public affairs, in addition to being a formal sort of communication ruled by law and order (Zémor, 2008). As a second meaning, it may be understood as the system of public information production through the media and all the institutions involved at structural level; that is to say, the public communication system (Martín-Serrano, 1994). Finally, a third meaning would come from a sociologic approach to information production, the treatment and dissemination practices of all the actors in the public space in an advanced democratic context (Demers, 2008).

This last approach is the one we take in this study, which has been built on the proposal by Norbert Elias (2010) on social configuration. In this way, the concepts of media development and public communication concur in a social configuration where media institutions, public affairs, the requirement of freedom of press, the need for a solid public-service media system, fair and adequate regulation, civil participation, accountability, plurality of voices, Internet access, expressions of justice demands and other similar aspects coexist. These are elements generated, exercised, and used by people in their daily practices, not only abstractions.

Therefore, we consider it important to relate and measure some of these variables with a view to ascertaining the links between media development, public communication, and social welfare in a situated manner.

METHODOLOGICAL STRATEGY

The set of hypotheses that structure our methodological strategy is as follows:

H1 (main): media development in the Mexican federated states is associated with their corresponding levels of social development.

H2 (alternative): media development in the Mexican federated states is partially associated with some conditions of social development such as access to higher welfare levels and democracy, media infrastructure, enjoyment of freedoms and rights to expression and the

reduction of problems such as corruption, violence, and poor governmental-administrative conduction.

H3 (alternative): media development in the Mexican federated states is negatively associated with some conditions of social development, to the extent that in the dominant commercial model in the media and telecommunications industry in Mexico, which favors concentration, operates as a factual power that may constrain rights and freedoms related to information and expression (Esteinou, 2015).

Existing statistics were reviewed to select, according to the statements of media development, the variables that enabled us to establish associations in an exploratory manner, on one side, between welfare conditions, social justice, and democratic advance, and on the other, between public communication and media development. The instruments where the variables come from are *Índice de Desarrollo Democrático* [Democratic Development Index], 2019 (PoliLat, 2020); *Encuesta Nacional de Calidad e Impacto Gubernamental* [National Survey of Governmental Quality and Impact], 2019 (Inegi, 2020a); *Encuesta Nacional de Victimización y Percepción sobre Seguridad Pública* [National Survey on Victimization and Public Security Perception], 2019 (Inegi, 2020b); *Encuesta Nacional sobre Disponibilidad y Uso de Tecnologías de la Información en los Hogares* [National Survey on Availability and Use of Information Technologies at the Households], 2019 (Inegi, 2020c); *Infraestructura de Radio y Televisión en México* [Radio and Television Infrastructure in Mexico] and *Datos de Usuarios de Telecomunicaciones* [Data on Telecommunication Users] (Instituto Federal de Telecomunicaciones, 2021).

In total, 29 variables were selected from the instruments, considering measures made in 2019, as it is the most recent year we had access to. A principal component analysis (PCA) was run on the resulting database, as this method transforms a set of original variables by means of their linear combination, producing such components (Ritchey, 2008).

PCA is a mathematical technique similar to factor analysis that allows reducing a large number of observed variables to fewer with abstract dimensions from the pattern of empirical relations measured between the cases of analysis. It is a technique utilized to deeply understand the aspects that are linked to one another, while differences between the abstract dimensions are maximized for their better comprehension. It may be stated that the variables or assessed aspects, which following the adequate proceedings of PCA, participate in a dimension —called component, in this case—, belong to the same sphere and are qualitatively different from the variables that are in another. Moreover, the result of PCA is the order of importance between dimensions and the priority order of the variables in each dimension (Mukherjee et al., 2018).

In this case, a database was built with the 29 variables from the surveys and national data, which were measured for the 32 federated states and underwent PCA to understand their non-evident relationships with the technical criteria we will explain below. This process allowed retaining five dimensions we found theoretically substantive, and were utilized in a later classificatory analysis of the cases.

The PCA criteria utilized here, following the usual procedure in this sort of exploratory statistical analysis (Jollife, 2002), were: 1) the correlation matrix of the 29 variables according to the metric of each one was taken; 2) Principal component extraction was used to maximize the similarity between the observed and calculated relationships; 3) The number of components that began the flattening of the sediment graph of explained variances was retained (Reis, Reis and Judd, 2000), which in this case were five and accounted for 64 percent of the calculated variance; 4) When analyzing the components we considered they have sufficient and different theoretical content when the table of factorial loads was analyzed for each component from a varimax rotation (orthogonal, that is to say, with the least overlapping between dimensions). This reduction process ended up in 23 variables corresponding to the principal components identified. This study is an exploratory proposal, in this way, it is subject to new analyses, reinterpretations and later discussions.

The behavior of data, whose analysis at national level does not express clearly significant trends, suggested that it was possible to disaggregate them in clusters of entities that internally would be grouped by similarities in various indices, as long as they clearly differentiated from the rest of clusters. For this purpose, we conducted a cluster analysis, which in the field of communication studies has been previously utilized for the recognition of journalistic frames (Rodelo & Muñiz, 2016). It is a nonhierarchical multivariate statistical method consistent with the application of an algorithm of iterative partition called *k-medias*; the goal is to maximize homogeneity and minimize heterogeneity inside each cluster to obtain mutually excluding sets on the basis of internal similarities (Ruiz, 2019). After applying it to the 23 variables selected in the previously described analysis in the 32 Mexican states, and after trying models with different numbers of clusters (k), the one with five was defined as the one which best grouped the states in function of their similarities.

RESULTS

Identification of five tendencies of media development in Mexico

In this section, the results of PCA for the 23 selected variables are presented, and then the correlations obtained by means of Pearson's test. These analyses precede that of clusters, in which the associative features of media development for the 32 states of the Mexican republic are identified. Table 1 shows the set of the most relevant variables in the five first components identified in the analysis.

Table 1. Set of variables selected by means of principal component analysis, with descriptive statistics, N=32

Variable	Abbrev.	Minimum	Maximum	Mean	Standard deviation
Index of freedom of press	IFP	0.000	10.000	6.9566	2.2889
Overall corruption	OC	36.6	63.1	49.878	6.2576
Rate of corruption in proceedings	RCP	6872	25389	13530.66	4317.589
Poor governmental performance	PGP	15.8	41.2	28.941	5.0164
Lack of coordination between government levels	LCL	5.3	17.5	10.672	3.0463
Lack of accountability	LAC	1.8	8.0	4.353	1.5864
Poor law application	PLA	9.3	25.6	16.478	4.0985
Poor attention in public health care centers and hospitals	PAH	13.8	53.8	29.978	7.4767
Poor quality of public education	PQE	6.8	21.2	10.828	3.4416
Insecurity and crime	IaC	32.7	86.7	74.616	11.8897
Gender violence	GV	.000	10.000	5.3948	2.9353
Natural disasters	ND	0.6	6.4	2.225	1.2394
Radio stations, commercial license	RCom	4	120	45.44	27.976
Radio stations, public license	RPub	1	42	10.56	9.034
Radio stations, social license[3]	RSoc	0	34	8.50	8.297
TV stations, commercial license	TVCom	9	80	31.25	16.044
TV stations, public license	TVPub	2	91	13.66	18.907
Household with Internet access	HIA	113825	27046552	573244.50	554807.794
Internet users	IU	511611	11371719	2322668.09	2145820.07
Users of cell phones	UCel	544585	11981426	2596241.63	2279739.46
Social democracy index	SDI	-2.613	1.329	-0.0339	0.9256
Economic democracy index	EDI	-3.436	2.849	.0000	1.2198
Democratic development index	DDI	0.000	10.000	5.6616	2.5402

Source: Own elaboration based on the selected variables and their metrics.

PCA allowed recognizing variables with a different nature that may be related to one another to generate empirical evidence with theoretically established links between social development, the quality of media system and public communication. Following, in Tables 2a, 2b, and 2c, the significant correlations found by means of the calculation of Pearson's coefficient for the 23 variables in the 32 Mexican republic states are shown.

[3] Here, the various sorts of social licenses recognized in *Ley federal de telecomunicaciones y radiodifusión* [Federal Law on Telecommunication and Broadcasting] are grouped: social, social-communitarian, and social-indigenous (Secretaría de Comunicaciones y Transportes, 2014).

Table 2a. Correlations by means of Pearson's coefficient, N=32

Variable	IFP	OC	RCP	PGP	LCL	LAC	PLA	PAH
Index of freedom of press (IFP)	1							
Overall corruption (OC)	-.086	1						
Corruption rate in proceedings (RCP)	-.294	.111	1					
Poor governmental performance (PGP)	.313	.504**	-.203	1				
Lack of coordination between government levels (LCL)	.346	-.157	-.099	.010	1			
Lack of accountability (LAC)	.385*	.015	-.056	.181	.608**	1		
Poor law application (PLA)	.215	.124	-.108	.216	.736**	.510**	1	
Poor attention in public health care centers and hospitals (PAH)	.086	-.486**	.044	-.476**	.396*	.497**	.043	1
Poor quality of public education (PQE)	.116	-.349*	.239	-.342	.336	.321	.147	.442*
Insecurity and crime (IaC)	-.249	.465**	-.171	.473**	-.304	-.446*	.130	-.731**
Gender violence (GV)	.018	-.107	.177	-.198	.010	-.044	.077	.272
Natural disasters (ND)	.033	.136	-.299	.087	.467**	.466**	.319	.131
Radio stations, commercial license (RCom)	-.328	.287	-.269	.103	.034	.014	.062	-.142
Radio stations, public license (RPub)	-.157	.064	-.035	-.032	-.083	-.006	-.075	.074
Radio stations, social license (RSoc)	-.322	.225	.113	.005	-.134	-.119	-.046	-.163
TV stations, commercial license (TVCom)	-.138	.207	-.318	.011	.027	.107	.089	.018
TV stations, public license (TVPub)	.021	.236	.071	.023	.025	-.001	.162	-.091
Households with Internet access (HIA)	-.338	.434*	.380*	-.024	-.067	-.061	.104	-.314
Internet users (IU)	-.375*	.359*	.385*	-.067	-.129	-.116	.042	-.299
Users of cell phones (UCel)	-.408*	.337	.382*	-.085	-.162	-.153	.006	-.308
Social democracy index (SDI)	.219	.442*	-.091	.343	.437*	.458**	.550**	-.129
Economic democracy index (EDI)	.119	.072	.058	-.069	.425*	.414*	.452**	.328
Democratic development index (DDI)	.488**	-.090	-.113	.050	.688**	.519**	.648**	.296

* Significant correlation at the level of 0.05 (bilateral)
** Significant correlation at the level of 0.01 (bilateral)

Source: Own elaboration based on the selected variables and their metrics.

Table 2b. Correlations by means of Pearson's coefficient, N=32

Variable	PQE	IaC	GV	ND	RCom	RPub	RSoc	TVCom
Poor quality of public education (PQE)	1							
Insecurity and crime (IaC)	-.451**	1						
Gender violence (GV)	.174	-.206	1					
Natural disasters (ND)	-.015	-.075	-.248	1				
Radio stations, commercial license (RCom)	-.188	.258	-.283	.306	1			
Radio stations, public license (RPub)	.280	.041	.177	.081	.342	1		
Radio stations, social license (RSoc)	.295	.181	.099	.093	.464**	.646**	1	
TV stations, commercial license (TVCom)	-.202	.120	-.043	.211	.748**	.356*	.309	1
TV stations, public license (TVPub)	-.018	.197	.199	-.156	.325	.342	.333	.094
Households with Internet access (HIA)	.097	.327	-.107	.017	.138	.073	.213	-.106
Internet users (IU)	.094	.318	-.094	-.029	.140	.085	.238	-.125
Users of cell phones (UCel)	.095	.320	-.097	-.037	.172	.105	.268	-.116
Social democracy index (SDI)	.052	.162	-.179	.421*	.011	-.039	-.030	.060
Economic democracy index (IDE)	.055	-.120	.161	.061	.011	-.114	-.162	.057
Democratic development index (DDI)	.251	-.248	.255	.184	-.340	-.168	-.315	-.205

* Significant correlation at the level of 0.05 (bilateral)
** Significant correlation at the level of 0.01 (bilateral)

Source: Own elaboration based on the selected variables and their metrics.

Table 2c. Correlations by means of Pearson's coefficient, N=32

Variable	TVPub	HIA	IU	UCel	SDI	EDI	DDI
TV stations, public license (TVPub)	1						
Households with Internet access (HIA)	.155	1					
Internet users (IU)	.141	.982**	1				
Users of cell phones (UCel)	.150	.971**	.997**	1			
Social democracy index (SDI)	-.113	.118	.039	.008	1		
Economic democracy index (EDI)	.269	.250	.202	.173	.126	1	
Democratic development index (DDI)	.049	-.047	-.140	-.191	.434*	.609**	1

* Significant correlation at the level of 0.05 (bilateral)
** Significant correlation at the level of 0.01 (bilateral)

Source: Own elaboration based on the selected variables and their metrics.

In Tables 2a, 2b, and 2c, there are four sets that stand out due to their significance level in the correlations between variables. It may be noticed that the four sets are distinguishable because of the significance level of correlations between variables. It is observed there are 26 highly significant correlations at the level of 0.01. Distinguishable are those linked to lack of accountability, coordination between government levels (.608), poor justice administration (.736), poor health care (.497), social democracy index (.458), and democratic development index (.419); correlation between freedom of press and democratic development index (.488); and households with Internet access and cell phone users (.971), with internet users (.982), as well the one that links both users, cell phones and Internet (.997). In theoretical terms, we suppose that

perceptions measured between the variables correlated with lack of accountability, and freedom of press have an important socialization component from the information disseminated by the communication media. However, self-referentiality is noticed in the media infrastructure between commercial television and commercial radio stations (.748), and between social radio licenses and the commercial ones (.464), and with public use licenses (.646).

A second set is composed of the 14 significant correlations at the level of 0.05. We noticed some correlations at this level between corruption (Corr and RCP) and technological variables (HIA, IU and Ucel), though since there were no strong theoretical connections between them, they may not be explanatory elements. Furthermore, the correlation between the index of freedom of press and lack of accountability (.385) was expected, and its empirical verification in this calculation is relevant, since these two variables define the importance of media development as a parameter of communicational aspects of democracy. The index of freedom of press is calculated with the number of attacked journalists and the citizens' perception of the freedom of expression in each state (PoliLat, 2020). Mexico is one of the countries where there are more attacks on journalists, and even murders. It has been documented that most of these attacks comes from state agents (Article-19, 2020; UNESCO, 2018). This may provide statistical evidence as regards the association of attacks on the press and censorship. In this sense, we deem the correlation between lack of accountability and the economic democracy index relevant (.414) because the citizens' economic decisions need a system of solid public information.

Therefore, the third and fourth sets comprise a number of correlations with negative sign at the levels of 0.01 and 0.05, which would show the verification of an inverse relationship between variables. These correlations mainly link governmental performance variables. Among the correlations that link to directly communicational variables, distinguishable are insecurity and crimes with lack of accountability (-.446), which is noticeable, as this relation would be expected positive. So is distinguishable the one between the index of freedom of press and Internet users (-.375) and cell phone users (-.408).

With a view to better using the data, the finer patterns were identified by means of *k-medias* analysis, using standardized values. The result was the identification of five consistent blocks of federated states in the country (Table 3). Then, the means of the 23 variables analyzed were calculated for each of the clusters (Table 4). From the analysis of the average behavior in their respective clusters of federated states, similarity patterns between them and differences with the rest of the clusters were identified. Once these characteristics were known, a name was given to each cluster.

Table 3. Cluster identification and their comprised federated states

No.	Name	Federated states
1	Corruption cluster	Coahuila, Durango, Guanajuato, Nuevo León, Quintana Roo, Sonora, and Zacatecas
2	Technology and poor governmental performance cluster	State of Mexico, and Mexico City
3	Democratic cluster	Aguascalientes, Baja California, Baja California Sur, Chihuahua, Colima, Hidalgo, Nayarit, Querétaro, San Luis Potosí, Sinaloa, and Tlaxcala
4	Media cluster	Chiapas, Guerrero, Jalisco, Michoacán, Morelos, Oaxaca, Puebla, Tabasco, Tamaulipas, and Veracruz
5	Backwardness cluster	Campeche and Yucatán

Source: Own elaboration based on the cluster analysis.

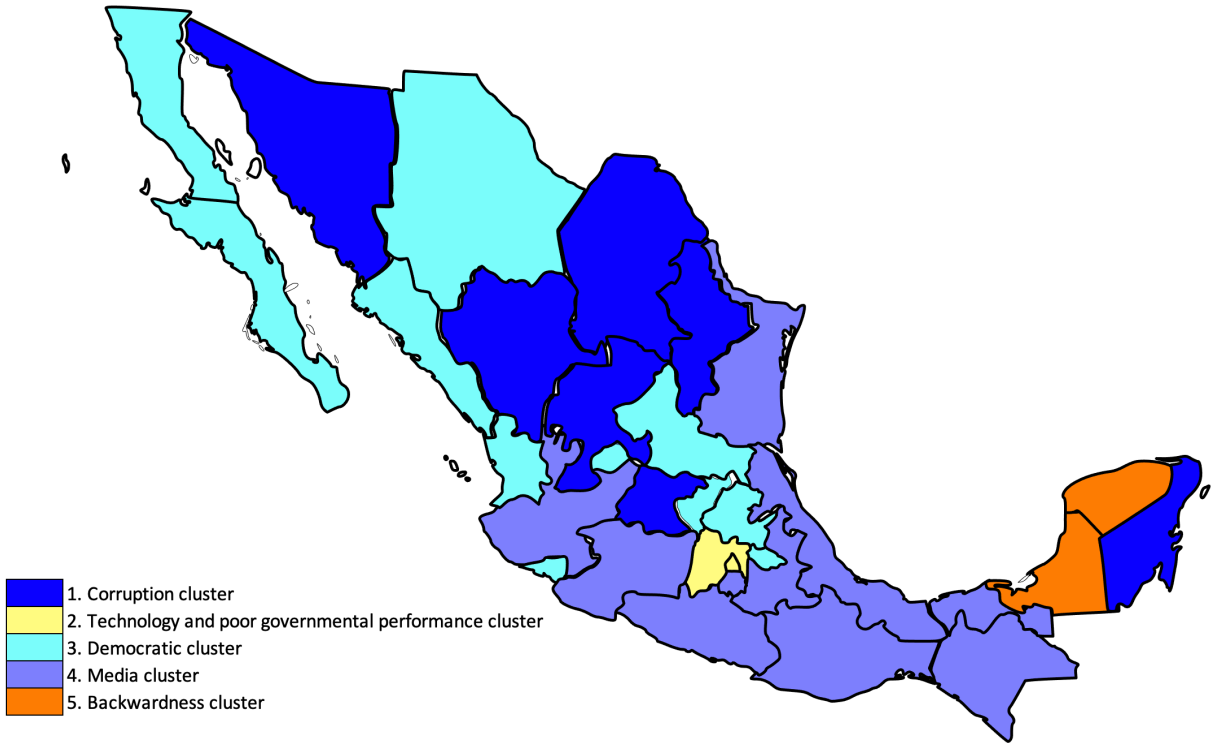
Table 4. Clusters and means (M) and standard deviations (SD) of selected variables, N=32

Variables		Clusters				
		1	2	3	4	5
Index of freedom of press (IFP)	M	7.3324	5.0075	8.2793	5.4963	7.61800
	SD	2.360654	0.563564	0.963920	2.736733	1.388758
Corruption (Corr)	M	55.114	54.300	48.627	49.010	38.350
	SD	4.8978	4.2426	5.9501	4.3488	2.4749
Rate of corruption in procedures	M	15246.71	20686.50	11256.82	13383.20	13612.00
(RCP)	SD	6153.936	4.950	2665.019	3321.002	497.803
Poor governmental performance	M	30.157	25.850	31.091	28.060	20.350
(PGP)	SD	5.0020	1.4849	4.8925	3.5167	6.4347
Lack of coordination between	M	10.471	9.600	12.600	8.180	14.300
government levels (LCL)	SD	2.1305	1.9799	2.5377	2.1017	4.5255
Lack of accountability (LAC)	M	4.271	4.100	5.327	3.110	5.750
	SD	1.3363	0.1414	1.6199	0.9085	1.9092
Poor law application (PLA)	M	17.286	18.050	18.945	13.180	15.000
	SD	3.5863	3.0406	3.7431	2.6305	6.5054
Poor attention in hospitals (PAH)	M	28.386	23.250	30.200	28.390	49.000
	SD	8.9888	2.1920	4.4077	4.0176	6.7882
Poor quality in education (PQE)	M	9.800	12.600	10.518	10.810	14.450
	SD	2.0809	2.1213	3.1543	3.4174	9.5459
Insecurity and crime (IaC)	M	75.286	81.750	75.200	77.980	45.100
	SD	11.6468	1.6263	9.1204	7.1661	17.5362
Gender violence (GV)	M	6.2364	5.3010	4.6590	5.2234	7.4470
	SD	2.882352	0.486489	3.740857	2.488250	1.308148
Natural disasters (ND)	M	1.657	1.700	2.818	2.060	2.300
	SD	0.8423	0.2828	1.7662	0.5481	1.5556
Radio stations, commercial	M	47.43	18.50	38.45	60.90	26.50
license (RCom)	SD	22.508	0.707	28.140	30.072	6.364
Radio stations, public license	M	11.86	7.00	7.73	14.00	8.00
(RPub)	SD	11.682	5.657	6.498	10.446	4.243
Radio stations, social license	M	10.29	8.00	4.73	12.80	2.00
(RSoc)	SD	4.990	5.657	2.573	12.630	1.414
TV stations, commercial	M	32.14	14.50	30.45	36.10	25.00
(TVCom)	SD	10.367	7.778	17.879	18.823	1.414
TV stations, public (TVPub)	M	33.29	8.50	5.36	11.60	6.00
	SD	33.525	0.707	2.767	8.113	1.414
Households with Internet access	M	546856.57	2329145.50	334379.82	574551.40	216922.50
(HIA)	SD	316796.283	531046.385	222426.972	348940.715	120831.114
Internet users (IU)	M	2031354.57	8849333.00	1362437.36	2545185.10	984284.50
	SD	1137642.031	3567192.491	759244.604	1338778.018	588428.100
Users of cell phones (UCel)	M	2222173.57	9340181.50	1495200.45	3022711.90	1084915.00
	SD	1204975.125	3735283.793	812687.969	1481021.207	663983.167
Social democracy index (IDS)	M	.20071	.08350	.60455	-.72120	-1.04850
	SD	0.663791	0.027577	0.462018	1.032242	0.714885
Economic democracy index	M	.74343	1.11300	0.3200	-.90550	.63650
(IDE)	SD	1.131889	0.111723	0.940304	1.192135	1.194303
Democratic development index	M	6.72914	6.78250	7.07682	2.67410	7.95900
(IDD)	SD	0.786799	2.731553	1.993554	1.179517	2.064752

Source: Own elaboration based on the cluster analysis.

Following, Map 1 shows the geographic location of each cluster and the states comprised

Map 1. Geographic location of the clusters in Mexico



Source: Own elaboration based on the cluster analysis.

Corruption cluster

The first cluster is composed of seven states: Coahuila, Durango, Guanajuato, Nuevo León, Quintana Roo, Sonora, and Zacatecas. Five of these states are in the north and adjoin one another; with the exception of Guanajuato and Quintana Roo, in the center and south, respectively. The adjoining location of these states, adding to the results of the analysis that grouped them, points at territorially-based characteristics. This is the case of the rest of clusters. This finding points at the verification of a subnational dynamic, in which internal similarities and differences between clusters might be explained by regional-order historic-contextual characteristics.

This cluster has the highest value in corruption (M=55.114, SD=4.8978), and the second in corruption in proceedings (M=15246.71, SD=6153.936), gender violence (M=6.2364, SD=2.882352), poor governmental performance (M=30.157, SD=5.0020) and radio (M=47.43, SD=22.508; M=11.86, SD=11.682; M=10.29; SD=4.990) and television infrastructure (M=32.14, SD=10.367; M=33.29, SD=33.525). It is a region where democratic backwardness expresses as blatant mistrust in government. The strong presence of radio and television media —an indicator of media development— would have to be complemented with the analysis of the quality of their contents, and audience participation. We do not have such information in the present study;

however, the fact that the index of freedom of press is not relevant in this cluster allows supposing its low quality.

Cluster of technology and poor governmental performance

This cluster comprises to adjoining states which are clearly the most important metropolitan zone in Mexico: the state of Mexico and Mexico City. Despite they are just two states, they account for 20.79 percent of the national population (Inegi, 2021). In this way, it is understandable that the cluster contains the highest values for households with Internet access (M=2329145.50, SD=531046.385), Internet users (M=8849333.00, SD=3567192.491), and users of cellphones (M=9340181.50, SD=3735283.793), as well as economic democracy index (M=1.11300, SD=0.111723), because of which we called it technologic.

However, this region also holds the first place in insecurity and crime (M=81.750, SD=9.1204) and the highest corruption rate in proceedings (M=20686.50, SD=4.950). It ranks second in poor law application (M=18.050, SD=3.0406), and poor quality in education (M=12.600, SD=2.1213). As well, it is also last in the index of freedom of press (M=5.0075, SD=0.563564), which makes it the most dangerous region for journalism.

This cluster has the most advanced urban conditions, since it does not have any paragon in other region in the country. However, the state of Mexico has highly marginalized rural areas; hence, in this cluster, two dissimilar realities in terms of social development intermingle. Besides, the technologic and economic progress of large cities —aspects theoretically recognized as part of media development— faces problems inherent to metropolises such as a high crime rate and corruption.

Democratic cluster

It comprises 11 states in the center and north of the country: Aguascalientes, Baja California, Baja California Sur, Chihuahua, Colima, Hidalgo, Nayarit, Querétaro, San Luis Potosí, Sinaloa, and Tlaxcala. This cluster has the highest value in freedom of press (M=20686.50, SD=0.963920), one of the foundations of modern democracy, which is consistent with the highest results in the measurements of social democracy, while second in democratic development (M=7.07682, SD=1.993554).

Despite their scant neighboring condition, they are a group of states that are distinguished by their economic and social development. Several of these states are repeatedly at the first places in measurements of democratic development and index of freedom of press (PoliLat, 2020). This cluster is promising in the context of the present study because it seemingly verifies theoretical statements of the approach of media development. In this way, this group is a research line to deepen into its characteristics and more finely observe the relationships between the media system, public communication, social development, and welfare.

Media cluster

It comprises 10 federated states mainly in the south and the Gulf: Chiapas, Guerrero, Jalisco, Michoacán, Morelos, Oaxaca, Puebla, Tabasco, Tamaulipas, and Veracruz. Its main characteristic is holding the first place in infrastructure for the three sorts of radio (M=60.90, SD=30.072; M=14.00, SD=10.446; M=12.80, SD=12.630) and television licenses (M=36.10, SD=18.823; M=11.60, SD=8.113), as well as Internet access at the households (M=574551.40, SD=348940.715), and second place in users of cell phones (M=3022711.90, SD=1481021.207). By contrast, it holds the penultimate place in the index of freedom of press (M=5.4963, SD=2.736733). In this cluster, Veracruz held the last place in freedom of press for almost the entire decade; while the other states have also had very low figures in this regard over the same period (DeLeón-Vázquez & González, 2020; PoliLat, 2020).

The result of the measurements of social and democratic aspects is not high in this cluster, a situation that is consistent with the self-referentiality of the media expressed in the correlational analysis. Though, it will be necessary, as in the previous cluster, to carry out a finer research that enables us to grasp what it means that this set of high figures in the media and telecommunication structure has very low records in freedom of press and is not outstanding in aspects related to social welfare, as theory would consider.

Backwardness cluster

This group is composed of two adjoining states: Campeche and Yucatán. The cluster groups around the variables that show greater backwardness in social development: lack of coordination between government levels (M=14.300, SD=4.5255), lack of accountability (M=5.750, SD=1.9092), poor health care attention (M=49.000, SD=6.7882), low quality in education (M=14.450, SD=9.5459), gender violence (M=7.4470, SD=1.308148), and presence of natural disasters (M=2.300, SD=1.5556). Conversely, it holds the second place in freedom of press (M=7.61800, SD=1.388758), and the first in democratic development (M=7.95900, SD=2.064752).

The variable Lack of accountability, associated with the others that characterize this cluster, allows considering the influence of media development in a negative manner. That is to say, in a context where the result of measurements of social welfare are low, the practices associated with right to information, transparency and accountability are compromised. Even so, it is possible that journalism and freedom of expression are highly valued by the citizens, as it has the second highest mean in the index of freedom of press. It is necessary to state there is need for elements to interpret the high value of the variable democratic development index in this cluster.

CONCLUSION

Although the results are not concluding, they allow advancing in devising an assessment model for media development in Mexico, in a contextual key. We contribute with the identification of five groups of federated states that share characteristics after analytically linking some variables

of social development and media development, at once, we open a way for finer studies in the future that produce statistical data of their own.

It was possible in this exploratory study to notice that the context expressed by the selected variables acts consistently, as well as the subnational logic underlying the dynamics of media and social development. Even though the results are still rather general, they show some features that need to be studied in detail and accurately to give an account of the way the communicational is organically integrated with social development, and in this way, contribute with and refine media development theories.

The definition of these five clusters offers a pattern to break down later theoretical approximations, both geographically and analytically. That is to say, it is established in the article which variables are relevant from the principal component analysis to be analyzed in each of the clusters. These variables, for their part, may be disaggregated in finer indices, or else, linked to others not considered here, but which theory suggests that are related.

However, it is necessary to recognize that for the cluster analysis, the mean values of the variables were utilized, which may be noticeably altered by the presence of atypical cases. Although in table 4 we included the value of standard deviation to give an account of the resistance or weakness of each average; in the future, it would be necessary to consider complementary analysis that allow verifying the findings.

Due to the foregoing, we are able to say that the goal of the research was met, as an assessment schema was established for media development in Mexico from quantitative elements that allowed linking relevant variables by means of an assessment metric, using principal component and cluster analyses. In like manner, the clusters produced are consistent in contextual terms, allowing the identification of groups of states that share problems that link them, which suggests the presence of subnational logics that lead to regional differences.

The starting theoretical postulates put forward that the conditions of the media system as regards observance of guarantees to exercise the freedoms and rights to information and communication, the extent and plurality of communication media, access to information and communications technology, media literacy, among others, are elements that favor sustainable social development and the strengthening of democracy. At once, a free, plural, and healthy media system is an indicator of development in broad terms and of democratic quality. However, the analyses conducted in this study did not yield a clear verification on this link. Owing to this, it is considered that the hypothesis that best explains the obtained results is H2: the media development of the Mexican federated states is partially associated with some social development conditions.

The first cluster, called corruption, groups states in the north of the country, in which organized crime has largely settled, i.e., Zacatecas, Durango, Nuevo León, and Coahuila. Moreover, in the latter there have been cases of embezzlement by local functionaries. Among this group, Guanajuato and Quintana Roo do not adjoin other localities, though they both have features that analytically associate them with the rest. The geographic togetherness of most of the states comprised in this cluster, together with the analysis on a statistic base, makes us suppose

there is historic and contextual sediments in which, should we deepen, perhaps it would be possible to find elements that explain in greater detail the studied variables. It is because of this that we consider there is subnational consistency, in this and the rest of clusters.

The second cluster, technology and poor governmental performance, groups two states that share the Metropolitan Zone of Mexico City, where there is a large demographic concentration. In this regard, the aspects underscored in the name makes us think, on one side, of the possibility to access technologic innovations, which becomes more feasible because of living in the capital of the country, and on the other, of the consequences of living in the most densely populated area in terms of administrative-governmental management. Here we do explicitly find media elements that show that demographic growth is accompanied by a larger demand of telecommunication services. Though, it contrasts with the last place in the index of freedom of press, which becomes a fundamental aspect to be analyzed with greater attention in a broader working agenda on the research of this cluster.

The third group, which was identified as democratic cluster, offers important results to support future decision about the research on media development. It is a set of states that has strengthened its economic, democratic and media development. It offers, thus far, the best scenario in Mexico with which to compare the results of the other clusters.

The fourth media cluster corresponds to a scenario in which one finds the largest number of radio and television stations with the three sorts of licenses: social, public, and commercial. This does not mean that automatically their media development level becomes greater than that of the rest of clusters; in order to find out, it would be necessary to analyze the quality of their practices and the freedom to exercise them. Such liberty, in point of fact, seems to be shortened, as it holds the last place in the index of freedom of press. In this cluster, there are states where there is a large number of rural localities that have a long tradition of indigenous and community radio stations, a situation that may explain the large number of broadcasters in this group.

Finally, we have the backwardness cluster. In this case, the features that characterize are low social and democratic development in terms of the selected measurements; nevertheless, it holds the second place in freedom of expression, which suggests that this scenario should be studied in detail to understand why these elements are together, whether they are related and if so, what that relationship means.

The subnational approach recognizes the level of agency and development of the subnational states in these research results, the empirical verification of the various attributions, competences and uneven decentralization processes at local and intermediate levels (Rolandi & Merello, 2017). The five tendencies identified in the cluster analysis are, in their substantiation, the set of diversified configurations of public communication that, in the subnational states, produce the various profiles of media development.

Specifically, as regards the dynamics of the state media systems and their development, our analysis allows identifying the characteristics of the resulting conglomerates as the more or less accurate identification of irregular modernization features (González & Echeverría, 2017). In this study, it is noticed, with hard data, the conditions of the processes of advance and delay in the

various contexts in the subnational space, where the conditions of the context mix with the practices of communicational systems, and thereby, with national, democratic and economic development.

Espino and Mendoza (2015) suggests that democratic backwardness derived from state governors' authoritarianism —an aspect which also appears in the proposals of González and Echeverría (2017)–, is the cause of the poor development of media and journalism in certain subnational states particularly prone to that problem. For Guerrero and Márquez Ramírez (2014), the problem is the alliances and complicities between the media and political powers, which in Latin America allow the media infrastructure to grow and also harnessing it economically, but also inhibit its vigilant capability for democratic advance. Such proposals are relevant interpretation frameworks for the results here presented, to the extent that our data seem to verify the explanations provided by these authors.

The final conclusion is that this exploratory research allowed identifying some features that link certain characteristics of the media-communicational in the groups of states identified by means of a cluster analysis, such as it is described in the section of analysis of results. However, to broaden the explanatory base, it is necessary to propose studies more focused on the factors of media development, for the purpose of more directly recognizing their impact on social development and the quality of Mexican democracy.

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