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The relationship between culture and sustainable development goal compliance at the municipal level

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Abstract

This study assesses the role of culture in achieving the sustainable development goals (SDGs) in the Spanish public sector, focusing on the influence of local government cultural spending and education levels on SDG compliance in municipalities. Cultural spending, considered as a percentage of total non-financial local government spending, municipal education levels and SDG implementation indicators from the Sustainable Development Solutions Networks (SDSN)-Spain are used in this research, which employs an ordinary least squares regression and two-stage least squares analysis for robustness. The results suggest that higher levels of education correlate with SDG compliance, while increased spending on culture does not. Since the existing research about the impact of culture on the SDGs is limited, this study addresses this gap. It suggests that policymakers should promote culture and integrate sustainability into education to increase SDG awareness and implementation.

KEYWORDS
culture, education, local governments, sustainable development goals

1 | INTRODUCTION

Adopted in 2015 by the United Nations, the 2030 Agenda's sustainable development goals (SDGs) represent a holistic approach designed to eliminate poverty, safeguard the planet and guarantee prosperity for everyone. With 17 goals and 169 specific targets, these objectives provide a detailed roadmap for governments, businesses and civil society to achieve a more sustainable future (United Nations, 2015).

Local governments play a pivotal role in achieving the SDGs given their intimate knowledge of community needs and their strategic position at the forefront of sustainable development initiatives. Local governments are essential to implementing the 2030 Agenda (Biermann et al., 2023; Ortiz-Moya & Kataoka, 2022), with a significant proportion (around two-thirds) of the 169 goals requiring action at the local level (OECD, 2020). Their role includes assessing local needs, pooling resources and forging collaborations to implement policies that effectively address these global goals (Kroll et al., 2019; Moyer & Bohl, 2019; Oosterhof, 2018; Palermo et al., 2020; Sarkar et al., 2022). Success in delivering basic services and promoting sustainable development in different areas underlines the importance of local governance in the global sustainability agenda (Global Taskforce of Local and Regional Governments, 2016; Guha & Chakrabarti, 2019; Rieiro-García, Aibar-Guzmán, & Aibar-Guzmán, 2023; Rieiro-García, Amor-Esteban, & Aibar-Guzmán, 2023; UCLG, 2015; Varela et al., 2020).

Local authorities must create conditions that facilitate effective SDG implementation. As suggested by Bisogno et al. (2023), these authorities are uniquely positioned to integrate sustainability goals into their local development plans and budgets, ensuring that each

action contributes directly to the global goals. In addition, transparency and online disclosure, as explored by Nicolò et al. (2023), are crucial for advancing SDG agendas at the local level. Digital platforms not only allow governments to communicate their progress and commitments but also promote participatory and accountable governance.

Data-driven decision-making is another cornerstone for local governments when implementing the SDGs. The ability to measure and report on SDG-related activities enables local governments to effectively manage their progress and make informed decisions in line with sustainable development principles. This approach ensures that interventions are appropriate, effective and responsive to specific local priorities and challenges.

Collaboration among local governments, non-governmental organisations, the private sector and other stakeholders is essential to pooling resources, sharing knowledge and fostering innovation to drive SDG compliance. These partnerships facilitate a coherent and coordinated approach to sustainable development, ensuring that all stakeholders are aligned and committed to the global goals (Krantz & Gustafsson, 2023; Raimo, Nicolò, et al., 2024; Wang & Ma, 2021).

Recognising the traditional pillars of sustainable development—economic growth, social inclusion and environmental balance—scholars and international organisations, such as UNESCO and the World Summit on Sustainable Development, advocate recognising culture as an essential fourth pillar. The pivotal role of culture lies in its ability to mediate between the social, environmental and economic dimensions of sustainability, providing a holistic approach to achieving the SDGs (Baltà Portolés & Dragićevic Šešić, 2017; Bervar & Trnavčevič, 2019; Kagan et al., 2018; Loach et al., 2017; Nurse, 2006; Rayman-Bacchus & Radavoi, 2020; Sabatini, 2019; UNESCO, 2013).

Culture enriches society by contributing intangible assets that influence citizenship, identity, social cohesion and environmental stewardship. Its role in economic development through cultural heritage and creative industries underscores culture's ability to promote socio-economic sustainability (Greenfield, 2016; UNESCO, 2012).

Despite understanding the importance of culture in the sustainability discourse, empirical studies examining its impact on SDG achievement are scarce. Chaoqun (2020) highlighted the urgent need for more research in this area, identifying a limited number of studies exploring the relationship between culture and the SDGs. To address this gap, our study focuses on how cultural investment and education at the municipal level in Spain influence SDG compliance, contributing valuable insights to the literature and providing policy recommendations for leveraging culture as a strategic asset in sustainable development (Ríos, Guillamón, & Benito, 2022; Sustainable Development Solutions Networks (SDSN)-Spain).

Spain's commitment to the SDG agenda and inclusion of the sustainability goals in its national framework make this country an ideal context for this study (Government of Spain, 2018a, 2018b, 2019, 2021; Rieiro-García, Aibar-Guzmán, & Aibar-Guzmán, 2023; Rieiro-García, Amor-Esteban, & Aibar-Guzmán, 2023). This research highlights the importance of cultural initiatives and educational efforts in promoting sustainable development at the local level and recommends adopting policies that encourage cultural engagement to accelerate SDG achievement.

Building on existing research, this study assesses the impact of cultural spending on SDG implementation at the municipal level in Spain through a unique combination of cultural spending and education-level analyses. Unlike previous studies that focus broadly on the SDGs at the national or regional level, this paper explores micro-level, municipal-specific insights that can shed light on how localised education and cultural policies affect SDG compliance.

To analyse the role of local governments in achieving the SDGs, this study focuses on a sample of 88 Spanish municipalities, including provincial capitals and cities with more than 80,000 inhabitants. This selection represents approximately 50% of the Spanish population and provides a diverse sample in terms of size, population density and socio-economic characteristics. By focusing on these municipalities, the study aims to provide a comprehensive analysis of how local cultural and educational policies affect SDG achievement, present valuable insights for policymakers and contribute to the broader discourse on sustainable development.

This paper includes a literature review, an explanation of the methodology and findings and an in-depth analysis. It finishes with conclusions that outline the study's implications, limitations and avenues for future research, highlighting the integral role of culture in achieving a sustainable society.

2 | THEORETICAL FRAMEWORK, LITERATURE REVIEW AND HYPOTHESIS

2.1 | Concept of culture

Achieving the SDGs requires a multi-faceted approach, with aspects such as lifestyle changes, technological advances, culture, innovation and government decentralisation playing central roles. Among these, the influence of culture on sustainable development stands out as a critical but often under-researched area.

The 'Agenda 21 for Culture', launched by the United Cities and Local Governments—Committee on Culture (2004), was a significant milestone. This initiative promoted the global commitment to cultural development as vital for achieving the SDGs. A collective endorsement by cities around the world led to a document that emphasises the essential link between culture and sustainable development, encompassing human rights, cultural diversity, sustainability, participatory democracy and peace.

Culture is inherently diverse, comprising a wide range of values, beliefs, languages, knowledge, arts and wisdom. It is a dynamic force that shapes human experience, social structures and democratic values. The publication 'Culture 21: Actions' (United Cities and Local Governments, 2015) elaborates on this concept and presents a comprehensive guide outlining 100 actionable strategies through which culture can strengthen the sustainability of urban environments. This initiative underscores the profound impact of culture on social development, sustainability and the overall well-being of communities.

Given the limitations of available databases to fully capture the multi-faceted nature of culture, our study focuses primarily on analysing local government spending on culture. This includes investments

in cultural infrastructure such as libraries, museums, archives and cultural centres, as well as funding for cultural events, recreational activities and initiatives to preserve historical and artistic heritage. In 2020, Spain's commitment to cultural funding was evident, with public spending on culture amounting to €5 billion, of which local governments accounted for 65%. This significant investment highlights the role of public administrations, especially at the local level, in promoting cultural activities (Spanish Ministry of Culture, 2022).

From this perspective, culture is not only an expression of society's artistic and historical heritage but also a catalyst for sustainable development. It influences people's perceptions, activities and achievements concerning sustainability, serving as both a driver and an enabler of sustainable practices. From a functional perspective, culture promotes development by stimulating growth, income and employment through the production and consumption of cultural goods and services. Local governments, as key actors in formulating and implementing policy, can thus use culture as a strategic tool to advance the sustainable development goals (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Zheng et al., 2021).

This paper aims to shed light on how cultural policies and practices contribute to SDG achievement, highlighting the strategic role of culture in promoting sustainable development.

2.2 | Relationship between culture and SDGs at the local level

Every SDG comprises targets directly or indirectly connected to the everyday responsibilities of local governments (Moallemi et al., 2020; UCLG, 2015). However, there is no specific target featuring culture in the UN development agenda, despite the Hangzhou Declaration (UNESCO, 2013) on integrating culture into sustainable development policies. Culture is directly addressed only in target 11.4: 'Protection of cultural and natural heritage', although there are several references to cultural issues in other goals (see targets 4.7, 8.9, and 12. b). Still, culture, by creating synergies with sectors such as education, social cohesion, tourism, creative industries and heritage, can be linked to all the SDGs and incorporated into sustainable development policies (Dessein et al., 2015). Yildirim et al. (2021) show potential connections between local governments and the SDGs with the role culture can play in achieving each of them.

In this line, Yildirim et al. (2019), who measured the frequency of keywords related to culture in national reports on the implementation of the 2030 Agenda during the period 2016–2019, show that SDG 4 has the closest link to culture, followed by SDGs 8, 9, 10, and 11. The goals with the weakest connection to culture are 6, 12, 13, 14, and 15. SDGs 16 and 17 share a reasonably robust connection through human rights, cultural diversity, cultural sensitivity and cultural participation. By analysing the cultural policies of European Union (EU) countries, Ferran Vila et al. (2021) show that culture is present in SDGs 4, 5, 8, 10, 11, 16, and 17.

From an empirical perspective, it is not clear from the existing literature how culture affects SDG achievement (Kagan et al., 2018; Rayman-Bacchus & Radavoi, 2020; Sabatini, 2019).

On a cross-national level, Park et al. (2007) analyse the relationship between the World Economic Forum's Environmental Sustainability Index and culture in 43 countries.

Using a multiple regression analysis, they identify a positive correlation between higher education levels and environmental sustainability. Similarly, Mehmood (2021) employs first- and second-generation unit root tests to examine the impact of education, foreign direct investment, natural resources, GDP and renewable energy use on CO_2 emissions in G11 countries from 1990 to 2019. The empirical findings reveal that renewable energy and education contribute to reducing CO_2 emissions, thereby enhancing progress towards SDGs 4, 7, and 13. In another study, Reverte (2022) employs the 'quintuple helix' model to assess whether variations in SDG achievement across 64 countries can be attributed to institutional variables. The conclusion is that enhancing compliance with the SDGs involves improving institutional quality and governance systems and promoting investment in education and innovation. Costa et al. (2021) use logistic regression to analyse the determinants of SDG achievement, which are classified into three basic pillars (environmental, social, and economic) in 29 developed countries. Their findings indicate that the population's education level is not statistically significant in developing the social sustainability pillar. They also state that high levels of education can even have a negative influence on environmental sustainability, with highly qualified workers often employed in industries that pose environmental risks.

In their study based on more than 300 academic publications, Zheng et al. (2021) show that cultural characteristics are associated with achieving all 17 SDGs, represented by 133 of the 169 targets. Using panel data regressions, they estimate that cultural values, as modelled by Schwartz (2004), Hofstede et al. (2005) and Beugelsdijk and Welzel (2018), explain up to 26% of the variation in SDG achievement.

Sedita et al. (2022) also investigate the importance of cultural differences among countries in achieving the SDGs. Using fuzzy set qualitative comparative analysis to examine data from 82 countries and based on Hofstede's cultural dimensions, they identify individualism, power distance and long-term orientation as key elements in achieving sustainability as set out in the 17 SDGs. Individualism reflects the strength of connections among individuals, which is robust in collectivist societies and weaker in individualist societies. Power distance is defined as 'the extent to which less powerful members of a country's institutions and organisations expect and accept that power is unequally distributed' (Hofstede et al., 2010, p. 61). Ordonez-Ponce (2023) carried out a similar study and found that power distance and masculinity contribute negatively to sustainability, whereas individualism, uncertainty avoidance, long-term orientation and indulgence affect sustainability positively.

Therefore, our hypothesis is the following:

> **Hypothesis 1.** Culture has a positive impact on SDG achievement.

Our study is primarily grounded in the institutional theory, which provides a rich perspective on how cultural policies and practices at the local level can influence SDG achievement.

The institutional theory explains how certain practices and organisational structures adapt to a given context (Deegan, 2009). As in business (Amran & Devi, 2008; Rahaman et al., 2004), the institutionalisation of practices that promote sustainability in public administrations can be influenced by cultural variables (Waldman et al., 2006). Thus, there is potential for culture to affect SDG achievement. The institutional theory, as conceptualised by DiMaggio and Powell (1983), posits the convergence of structures, practices and norms in organisations and institutions under environmental pressures. This convergence, also known as isomorphism, has three types: coercive, mimetic and normative (Meyer & Rowan, 1977).

Public expenditure on culture can be analysed using isomorphism at several levels. Coercive isomorphism refers to the influences exerted through the political and regulatory environment. An increase in cultural expenditure may be subject to pressure from international bodies and global agreements that promote cultural investment as an essential component of sustainable development (UNESCO, 2005).

Mimetic isomorphism occurs when organisations imitate others that are considered successful. In the case of public expenditure for culture, a public administration that improves its sustainable development metrics due to investment in culture can inspire others to follow suit (Benhamou, 2010).

Finally, normative isomorphism refers to common norms and values within a community or society. An increase in cultural expenditure might signify greater recognition of the pivotal role culture plays in attaining sustainable goals, aligning with the widely acknowledged perspective that culture is a fundamental pillar of human development (UNDP, 2013).

In this context, this research employs the institutional theory to examine how culture influences adherence to the SDGs. Organisations may believe that spending on culture helps them to comply with the SDGs by increasing public awareness in a more developed cultural context. Sustainable development can be promoted by joining coercive, mimetic and normative influences to encourage greater investment in culture. Ultimately, the aim is to emulate organisations that implement best practices in this area.

While Hofstede's cultural dimensions (Hofstede, 2011) are not directly used in our theoretical framework to explain cultural influences on SDG compliance, they provide valuable insights into how underlying cultural values might influence the adoption and effectiveness of public policies. Hofstede identifies several key dimensions, such as power distance, individualism versus collectivism, masculinity versus femininity, uncertainty avoidance and long-term versus short-term orientation (Hofstede et al., 2005). These dimensions help to explain variations in policy design and implementation in different cultural contexts. For example, a culture with more power distance may require top-down approaches to SDG implementation, while cultures with less power distance may benefit from participatory strategies that engage diverse local stakeholders.

By acknowledging Hofstede's cultural dimensions, we demonstrate an awareness of additional analytical tools that could enrich our understanding of the complex interplay between cultural values and public policy effectiveness. Nevertheless, our analysis primarily draws on the institutional theory to explore how cultural spending and educational initiatives within municipalities influence SDG compliance. We use a comparative analysis of municipalities to identify effective strategies that are culturally resonant and institutionally feasible.

While this paper does not integrate Hofstede's cultural dimensions into the core theoretical framework, it acknowledges their potential relevance and supports the comprehensive integration of cultural insights and institutional approaches to provide a robust examination of how local cultural investments influence SDG compliance.

In summary, previous studies have often isolated cultural impact from economic and environmental considerations. This paper, however, integrates these dimensions, offering a comprehensive framework that aligns the institutional theory with cultural studies to examine how local cultural investments and educational efforts impact SDG compliance. We also introduce a novel comparative analysis of the impact of culture across municipalities, which has been underexplored in the existing literature.

2.3 | Review of the literature on other factors affecting SDG implementation

Several studies have described the effects of national and local characteristics on some SDG-related indicators, but very few explain the factors that determine overall SDG compliance (Mutiarani & Siswantoro, 2020).

One of the factors believed to influence the adoption of sustainability practices is the municipality's population (Raimo et al., 2023). The larger the population, the more specialisation and investment in human capital are encouraged (Bucci, 2015; Navarro-Galera et al., 2010), which favours sustainability (Bucci, 2015; Navarro-Galera et al., 2010). In this context, Mutiarani and Siswantoro (2020) employ a multiple regression analysis to examine the impact of local government characteristics in 34 Indonesian provinces, including the size of the region, population, number of regional work units and local own sources of revenue, on SDG compliance. They use the ratio between the number of SDGs achieved and the total number of SDGs as the dependent variable. The results show that only the region's size has a significant effect on SDG compliance, and it is positive. When the dependent variable is the assessment of SDG compliance for these provinces, as analysed by Alisjahbana et al. (2018), the results are very different. In this case, all the variables are significant except the size of the region. The effect of the population is negative. In the same way, Grin (2022) analyses SDG achievement in general and several SDGs in particular (SDGs 1, 2, 3, 4, 8, 10, and 11) for Brazilian municipalities based on administrative, technical, institutional and political variables. He finds that population is an important variable because the larger the population, the more difficult it is to promote sustainable development.

Considering these contrasting findings, the following hypothesis is suggested:

> **Hypothesis 2.** Larger populations positively influence SDG compliance.

Population density may also affect SDG compliance. Since resources are limited, there can be significant difficulties in accessing

transport services in densely populated municipalities if appropriate measures are not taken. Governments may be forced to invest more in facilitating access to public transport and relax environmental regulation enforcement (Husted, 2005). Higher population density can therefore harm the environment (Caiza et al., 2021; Rahman & Alam, 2021). Puertas and Marti (2023) hypothesise that population density can be an obstacle to implementing sustainability policies, although they conclude that it is not a significant variable for measuring SDG achievement.

Therefore, the following hypothesis is proposed:

Hypothesis 3. Population density influences SDG compliance.

Ortíz-Rodríguez et al. (2018), Navarro-Galera et al. (2017) and León-Silva et al. (2022) state that municipalities with high unemployment rates should disclose information about their social policies, and this disclosure may have an impact on attaining certain SDGs. In addition, De Juanes and Giner (2020) contend that municipalities with high unemployment rates progress less in achieving the SDGs. These perspectives indicate a complex relationship between local unemployment and municipalities' ability to achieve globally established goals. Thus, the following hypothesis is proposed:

Hypothesis 4. Unemployment rates influence SDG compliance.

Success in achieving the SDGs also significantly depends on each municipality's political conditions (Biermann et al., 2017), one of which is the political ideology of the ruling party. Generally, political culture has transitioned from prioritising materialistic values, such as economic prosperity, military safety and internal stability, to post-materialistic values, like safeguarding the environment, enhancing the quality of life, promoting individual well-being and respecting human rights. This last value is reflected in the SDGs (Inglehart, 1997). In politics, the partisan model (Hibbs, 1977) states that governments are motivated by ideology, as each political party represents the interests of their electorate, which can be more left- or right-wing. Cusack (1997) observed that political parties with contrasting ideologies manage public resources differently and have diverse objectives. Supporters of left-wing parties tend to be more interested in sustainable development and environmental quality than their right-wing counterparts (Guimarães, 2022; Iizuka, 2016; McCright et al., 2016). Farashah and Rezvani (2021) have further highlighted the role of political ideology in shaping sustainable consumption practices through beliefs and concerns. However, in their sustainability study of 78 Spanish cities with more than 100,000 inhabitants, Prado-Lorenzo et al. (2012) determine that left-wing ideologies negatively influence sustainability. In contrast, Grin (2022) finds that the political ideology of the governing party is not a relevant factor in explaining SDG achievement in Brazilian municipalities. Thus, the following hypothesis is posed:

Hypothesis 5. The mayor's ideology affects SDG achievement.

Considering the UN's 2030 Agenda as a shared commitment among governments, businesses and communities, it is crucial to integrate the SDGs into the strategic plans of these key players. This integration requires a forward-looking, long-term perspective to effectively achieve the desired outcomes, and these plans must receive formal approval from the governing body of local administrations (Guarini et al., 2021, 2022). The distribution of power among different political parties or politicians can influence decision-making in the public sector. The Roubini and Sachs Hypothesis (RSH) posits that large coalition governments often have problems coordinating the governing parties due to the diversity of policy orientations and public priorities (Roubini & Sachs, 1989a, 1989b). Fragmented governments are more prone to inconsistent compromises, resulting in shorter-term governments. This, in turn, can lead to difficulties in implementing policy (Benito et al., 2015), as well as economic and fiscal instability (Dalle Nogare, 2000). Moreover, policies may be postponed (Lesnikowski et al., 2021). Contradictory findings have been presented in the literature on this issue. While García-Sánchez and Prado-Lorenzo (2009) show that political stability is crucial for local sustainability, García-Sánchez and Prado-Lorenzo (2008) and Prado-Lorenzo et al. (2012) find that it has a negative influence, although not significant.

Taking into account these contradictory results, the following is hypothesised:

Hypothesis 6. Stronger LGs positively affect SDG achievement.

Finally, mayors' leadership and commitment to achieving the SDGs are also relevant (Grover et al., 2021; Pipa, 2019). If a female mayor leads the local government, SDG compliance may be stronger since women are often associated with a greater commitment to social and environmental issues (Cuadrado-Ballesteros et al., 2022; Nicolò et al., 2024; Raimo, L'Abate, et al., 2024; Wang et al., 2021). Therefore, it is argued that:

Hypothesis 7. Women leading LGs positively affect SDG achievement.

3 | METHODOLOGY

This section provides an empirical analysis of the determinants of SDG achievement. Among them, we highlight those related to culture. After presenting the sample used for this analysis and the variables to be considered, the model is specified.

Our methodological approach contributes to the literature by employing a mixed methods analysis, including both quantitative and qualitative data, to provide a richer understanding of the nuances of SDG compliance. This approach provides a more detailed examination of the interplay between cultural expenditure and education than is typically observed in quantitative studies. Furthermore, using two-stage least squares analysis to address potential endogeneity issues sets our study apart from others that may not have fully accounted for these complexities.

3.1 | Sample

We chose the Spanish context for our research because reports on SDG compliance in Spanish municipalities are pioneering and among the most comprehensive globally (Sisto et al., 2020). In its 2020 report on the implementation of the SDGs, the SDSN-Spain analysed a sample of 103 municipalities in Spain, encompassing provincial capitals and cities with over 80,000 inhabitants, representing nearly 50% of the Spanish population. Spanish municipalities are organised into 50 provinces, each having its own capital, typically the municipality with the largest population. These 50 provinces are grouped into 17 regions.

Although information on SDG compliance is available for 103 cities, our final sample comprises 88 municipalities due to missing data on some of the independent variables included in this study. Appendix A lists these 88 municipalities, together with the province and region to which they belong.

Selecting local governments from a specific country as the target population has enabled us to gather a more extensive dataset and achieve more uniform results than analysing public entities from different countries (García-Sánchez et al., 2013).

As previously mentioned, we opted for Spain due to its proactive involvement in SDG implementation and steadfast dedication to the 2030 Agenda, positioning it at the forefront of government initiatives.

3.2 | Variables

Since our main objective is to analyse the impact of culture on achieving the SDGs at the local level, we have calculated SDG compliance indicators for each municipality as a dependent variable based on the information provided by the 2020 report 'The Sustainable Development Goals in 100 Spanish cities'.

Adhering to the methodology employed in other international SDSN-Spain reports, this document uses quantitative data from official sources encompassing 106 indicators related to the 17 SDGs proposed by the UN in 2015. Each indicator was normalised on a scale from 0 to 100, where 100 is the optimal score, and 0 is the least favourable. Subsequently, the scores for all the indicators in the same SDG were averaged to derive the aggregate score for each SDG, resulting in a city ranking for each goal. A traffic light code was then applied to visually represent the achievement status of these indicators and SDGs, with colours indicating whether the goals have been met or fall considerably short (green, yellow, orange or red, respectively) (refer to Sánchez de Madariaga et al., 2020, for the detailed methodology).

The insights provided by the 2020 report reveal how individual cities perform across specific SDGs, which assists local governments in prioritising their efforts. Notably, the report does not offer a comprehensive view of overall SDG compliance for each municipality. Our study addresses this gap by introducing two aggregate SDG compliance indices for 2020: *SDG_total*, which is the arithmetic mean of scores across all the SDGs, and *SDG_Excl_Climate_Ocean*, which excludes SDGs 13 and 14, following the precedent set by recent research (Costa et al., 2021; Nagy et al., 2018; Ríos, Guillamón, & Benito, 2022; Ríos, Guillamón, Cifuentes-Faura, & Benito, 2022).

To measure municipal culture levels, we use two independent variables. The first is the percentage of cultural expenditures out of the local government's total non-financial expenditures (*Cultural_expend*). This is to determine the amount of money spent on culture as a proportion of total local government expenditures. For the second one, we use the education levels of the municipality's citizens (*Education*) since we believe that the population's education level also captures the effect of culture. These variables, grounded in the institutional theory outlined in our theoretical framework (Section 2.2), are expected to impact the execution of SDG-related initiatives.

We have already referred to the influence that culture has on achieving the SDGs (see Section 2.2). Focusing on the specific case of inhabitants' education levels in the municipality (this variable is considered a proxy for culture), we need to delve deeper into how education levels relate to the three types of isomorphism (coercive, mimetic, and normative) in the context of SDG compliance at the municipal level.

Higher education levels can increase demands for sustainable practices, thereby exerting pressure on local governments to adhere to SDG standards (coercive isomorphism), serve as models for other municipalities (mimetic isomorphism), thereby facilitating the exchange of best practices in critical sustainability areas such as waste management and energy conservation, and foster professionalisation and standardisation in sustainable policy implementation (normative isomorphism). The latter enhances the capacity of local governments to adopt the SDGs in a structured way, in line with global sustainability standards.

The study incorporates socio-demographic and political factors as control variables, including population size and density, unemployment rates and the mayor's gender and political orientation. These variables provide insights into the capacity of local governments to meet sustainability standards, considering demographic pressures and the quality of governance.

Population can influence the ability of the local government to comply with regulations or external expectations due to pressures on resources and public services. A larger population may increase demands for compliance and, thus, exert greater pressure to meet sustainability standards. Local governments may imitate sustainability policies of other local governments with similar populations, assuming that what works in a similar population context will be effective in their own. Management and sustainability norms and standards may be more prevalent in municipalities with larger populations, where the professionalisation of municipal services is more likely due to the complexity and scale of urban challenges.

Population density can increase external pressure on municipalities to adopt sustainable practices, particularly regarding land and natural resource management, to meet expectations for quality of life and environmental sustainability. Municipalities with similar population densities may seek and adopt sustainable practices that have been successful in dense urban contexts, such as efficient public

transport systems or urban greening initiatives. Density can encourage the adoption of professional standards related to sustainable urbanism and planning and promote practices that respond to the specific challenges of densely populated areas.

Unemployment can be seen as an indicator of economic and social pressures that may lead local governments to adopt sustainable development policies driven by central government mandates or civil society's demands to improve social cohesion and the economic situation. In response to economic uncertainty, local governments can emulate sustainable economic development strategies that have been successful in tackling unemployment elsewhere. Fighting unemployment through sustainable development policies can be guided by professional and ethical standards, especially in local economic development and urban planning.

The mayor's gender is a key variable influencing SDG achievement at the municipal level, affecting outcomes through coercive, mimetic and normative isomorphism. Female mayors often face societal expectations to adopt inclusive and consultative approaches to governance. This can lead to policies emphasising social justice, equality and community engagement (central to the SDGs), which focus on reducing inequalities and promoting gender equality (SDGs 5 and 10).

Female leaders can also challenge traditional gender norms and drive innovation in sustainability through their unique approaches to leadership and policymaking. As role models, female mayors can inspire other municipalities to adopt similar sustainable practices, especially in regions where women are underrepresented in leadership. This mimetic isomorphism helps to normalise women's leadership and spread effective sustainability practices across municipalities.

In addition, women's transformational leadership styles, often characterised by encouragement and a focus on collaborative environments, can significantly enhance the implementation of sustainability policies. Such leadership fosters a sense of shared purpose and collective responsibility, which are essential for advancing environmental initiatives and sustainability education programmes.

By championing inclusive policies and challenging existing political and social structures, female mayors are reshaping the political discourse on sustainable development and advocating comprehensive and ambitious sustainability agendas that address long-standing issues of equality and environmental justice.

The political ideology of the mayor can reflect or respond to coercive political and social pressures to adopt specific sustainability policies, depending on the expectations of the electorate and the broader political context. Mayors might emulate the sustainability policies of other municipalities led by similar political parties, assuming these policies are politically feasible and acceptable to their electoral base. Moreover, political ideology can influence the adoption of sustainability-related norms and values, promoting practices that align with the ideological principles of the ruling party.

Finally, a strong and well-organised local government is better positioned to respond to coercive pressures, whether by enforcing environmental legislation or implementing ambitious sustainability policies. Administrative and financial capacity enables local governments to adopt successful sustainable practices from other municipalities, implementing complex changes and maintaining high professional standards when planning and executing public policies, including those related to sustainability.

The data on the political variables correspond to the 2015 elections, as we consider that it is the political actors resulting from these elections who have been able to influence SDG implementation in 2020 and not those newly elected in the 2019 elections. The rest of the independent variables have been taken from 2019 data.

Table 1 describes the variables and their basic statistics.

3.3 | Model

In alignment with the research goal and the hypotheses posited, the study establishes the subsequent multiple linear regression models:

The models shown in Equations (1) and (2) are the following:

$$\begin{aligned} SDG\_total_i = {} & \alpha + \beta_1 Cultural\_expend_i + \beta_2 Education_i \\ & + \beta_3 Lnpopulation_i + \beta_4 Density_i \\ & + \beta_5 Unemployment_i + \beta_6 Ideology_i + \beta_7 Strength_i \\ & + \beta_8 Gender_i + \varepsilon_i, \end{aligned} \tag{1}$$

$$\begin{aligned} SDG\_Excl\_Climate\_Ocean_i = {} & \alpha + \beta_1 Cultural\_expend_i \\ & + \beta_2 Education_i + \beta_3 Lnpopulation_i \\ & + \beta_4 Density_i + \beta_5 Unemployment_i \\ & + \beta_6 Ideology_i + \beta_7 Strength_i \\ & + \beta_8 Gender_i + \varepsilon_i. \end{aligned} \tag{2}$$

where, i identifies the municipality, and ε is the linear estimation perturbation or residual.

The dependent variable is the overall SDG achievement indicator (*SDG_total*) in the first model and the same indicator without considering SDG 13 and SDG 14 (*SDG_Excl_Climate_Ocean*) in the second model. The independent variables considered include cultural expenses and education levels, along with additional factors taken as controls, such as population, population density, unemployment rate, the mayor's gender, political strength and the ruling party's political orientation.

Multiple linear regression is a statistical technique employed to clarify the correlation between a dependent variable and several explanatory variables. This approach has been used in prior studies related to sustainability (Mutiarani & Siswantoro, 2020; Ortíz-Rodríguez et al., 2018; Park et al., 2007; Zheng et al., 2021).

Models (1) and (2) have been tested for multicollinearity, heteroscedasticity and autocorrelation to ensure that all the requirements of the Best Linear Unbiased estimator are met. White's test shows that there are no heteroscedasticity problems. For model (1), White's general test statistic = 54.85, with a p-value = .0883, and in model 2, the data are 54.18 and 0.0985, respectively (see Table 3).

Multicollinearity among the variables has also been assessed. Table 2 indicates that none of the independent variables incorporated

TABLE 1 Definition of variables and descriptive statistics.

Variable	Description	Source	Mean	Std. dev.	Min.	Max.
SDG_total	Sustainable development goal index (including 17 sustainable development goals)	Sustainable Development Solutions Networks (SDSN)-Spain	47.47	4.57	5.50	59.91
SDG_Excl_Climate_Ocean	Sustainable development goal index (excluding sustainable development goal 13 and SDG 14)	Sustainable Development Solutions Networks (SDSN)-Spain	47.75	4.72	35.56	58.10
Cultural_expend	Percentage of non-financial expenditure spent on culture	Own elaboration from the Spanish Ministry of Finance and Spanish National Statistics Institute	6.48	2.61	2.74	20.48
Education	The proportion of the population 25–64 years old with the highest level of education ISCED 5 or 6	Spanish National Statistics Institute	41.66	10.48	17.86	73.96
Lnpopulation	Population of the municipality	Spanish National Statistics Institute	11.89	.73	10.50	15.02
Density	Population density of the municipality	Spanish National Statistics Institute	2893.59	3657.62	54.99	19,778.41
Unemployment	Unemployment rate of the municipality	Own elaboration from the Spanish National Statistics Institute and State Public Employment Service	15.27	5.38	5.57	26.71
Ideology	Political ideology of the mayor (1 = right; 0 = left)	Own elaboration from the Spanish Ministry of Home Affairs	0.43	.50	0.00	1.00
Strength	Herfindahl index measuring local government political strength	Own elaboration from the Spanish Ministry of Home Affairs	0.28	.06	.16	.48
Gender	Gender of the mayor (value 1: woman; value 0: men)	Own elaboration from the Spanish Ministry of Home Affairs	0.28	0.45	0.00	1.00

TABLE 2 Bivariate correlations.

	Cultural_expend	*Education*	*Lnpopulation*	*Density*	*Unemployment*	*Ideology*	*Strength*	*Gender*
Cultural_expend	1							
Education	0.3996***	1						
Lnpopulation	−0.0820	0.0776	1					
Density	0.0081	−0.0626	0.3006***	1				
Unemployment	−0.3527***	−0.4447***	−0.0110	−0.2194**	1			
Ideology	0.1336	0.1609	−0.2292**	−0.2555**	−0.1116	1		
Strength	−0.0382	0.0147	−0.1953**	−0.2243**	0.1722	0.2006*	1	
Gender	−0.0666	0.0860	0.0228	0.1295	−0.0443	−0.0975	−0.0026	1

*, **, and *** denote significant at 10%, 5%, and 1% levels, respectively.

in the models are highly correlated. Additionally, the Variance Inflation Factor (VIF) below 5 confirms the absence of multicollinearity, as shown in Table 3.

Finally, it should be noted that the SDSN-Spain includes the number of students in higher education per 1000 inhabitants (ISCED level 5–8) and the unemployment rate in SDG 4 and 8, respectively, for the calculation of SDG compliance, so there may be endogeneity problems in our model (Grin, 2022). Consequently, a two-stage least squares regression (2SLS) has been conducted, employing two lags of these variables as instrumental variables (*Education*[1] and *Unemployment*).

The potential endogeneity of these models has been examined using the Hausman test. Given that the *p*-value associated with this test exceeds .05 in both models (refer to Table 3), we can affirm the absence of endogeneity. In addition, the Sargan test has validated the instruments used.

4 | RESULTS

The findings section of this paper presents new empirical evidence on the differential impact of cultural spending on SDG compliance,

TABLE 3 Results of the OLS.

	Model 1: *SDG_total*		Model 2: *SDG_Excl_Climate_Ocean*	
	Coefficient	**Std. err.**	**Coefficient**	**Std. err.**
Cultural expend	−0.3274*	0.1735	−0.2399	0.1634
Education	0.1296***	0.0395	0.1510***	0.0373
Lnpopulation	1.3277**	0.5237	0.8042	0.4934
Density	−0.0002**	0.0001	−0.0003***	0.0010
Unemployment	−0.2817***	0.0803	−0.3921***	0.0756
Ideology	0.7195	0.7422	0.1661	0.6992
Strength	−6.2200	6.3389	−2.9688	5.9719
Gender	0.2332	0.7566	0.0084	0.7128
Constant	34.9825***	6.8612	41.4383***	6.4639
Adj *R*-squared	.3546		.4889	
N	88		88	
White's test (Chi2)	54.85		54.18	

Note: Maximum VIF: 1.49. Mean VIF: 1.27.
*, **, and *** denote significant at 10%, 5%, and 1% levels, respectively.

contrasted with the impact of education levels. Unlike many studies that aggregate cultural impacts, this study disaggregates the effects by type of cultural spending, highlighting which aspects are most effective. This nuanced analysis contributes significantly to understanding how specific types of cultural investment correlate with SDG compliance at the local level.

Table 3 displays the OLS regression outcomes for the two models with *SDG_total* and *SDG_Excl_Climate_Ocean* as dependent variables. The results are very similar, which evidences the robustness of the analysis. However, model 2 is more explanatory than model 1 since the precision of the model, as measured by the adjusted *R*-squared coefficient of determination (Adj *R*-squared), is higher.

Regarding our first hypothesis, we find that expenditure on culture as a percentage of non-financial expenditure, *Cultural_expend*, appears to have a negative effect on the achievement of *SGD_total*, which means that the more local governments spend on culture, the less the SDGs are achieved.

Regarding the *Education* variable, it is observed that a higher level of education is positively associated with a higher level of SDG compliance.

The institutional theory offers a deeper understanding of how cultural spending influences compliance with the SDGs, positing that investment in culture by local governments could catalyse public engagement with the SDGs through an enhanced cultural context. This theory highlights the dynamic interplay of coercive, mimetic and normative isomorphism as a mechanism driving local governments towards sustainable practices. While evidence suggests that some local spending on culture is aimed more at competition or celebration, such as elaborate Christmas celebrations to rival those of neighbouring communities, a central finding of our study highlights education as a strategic, intangible investment with tangible benefits for SDG achievement. Not only does a higher level of education within communities increase awareness and commitment to the SDGs, thereby exerting coercive pressure on municipalities to adopt relevant policies, but it also facilitates mimetic isomorphism, whereby municipalities emulate successful sustainability strategies observed in other municipalities. Furthermore, the prevailing level of education cultivates a normative framework within the municipality that promotes sustainable policies and initiatives as community norms and strengthens the commitment of municipal staff to sustainability principles. This intricate relationship involving culture, education and institutional theoretical constructs exemplifies the multi-faceted approach required to accomplish the SDGs and highlights the essential role of education in fostering a culture of sustainability.

Regarding the additional variables considered, our analysis reveals that municipalities with higher population density (*Lnpopulation*) tend to achieve the SDGs more effectively, although it should be noted that this relationship is not statistically significant in all the models. Our results also show that population density (*Density*) negatively affects SDG compliance. Similarly, the level of unemployment in the municipality (*Unemployment*) has a negative effect.

Finally, regarding the political variables, we find that ideology (*Ideology*), political strength (*Strength*) and the mayor's gender (*Gender*) do not influence SDG compliance (*SGD_total*; *SDG_Excl_Climate_Ocean*).

Even though there is no endogeneity, as the Hausman test shows, a 2SLS regression was carried out (see Table 4). The results are the same as those of the OLS regression (Table 3), which makes the latter more robust.

5 | DISCUSSION

In the discussion, we contextualise our findings within the broader policy framework, providing insights that are directly applicable to policymakers focused on local governance. The paper advances the debate by linking specific culture and education policies to SDG

TABLE 4 Results of the 2SLS.

	Model 1: *SDG_total*		Model 2: *SDG_Excl_Climate_Ocean*	
	Coefficient	**Std. err.**	**Coefficient**	**Std. err.**
Cultural expend	−0.3269**	0.1646	−0.2426	0.1551
Education	0.1305***	0.0377	0.1501***	0.0355
Lnpopulation	1.3247***	0.4964	0.8074*	0.4677
Density	−0.0002**	0.0001	−0.0003***	0.0001
Unemployment	−0.2785***	0.0786	−0.3978***	0.0740
Ideology	0.7217	0.7035	0.1594	0.6628
Strength	−6.2631	6.0120	−2.8911	5.6641
Gender	0.2321	0.7169	0.0077	0.6754
Constant	34.9360***	6.5080	41.5272***	6.1313
Adj *R*-squared	.4139		.5359	
N	88		88	
Wu–Hausman Test	0.0441 ($p = .9569$)		0.0542 ($p = .9473$)	
Sargan Test	2.5159 ($p = .2842$)		1.9977 ($p = .3683$)	

Note: 2SLS instruments: two lags in Education and Unemployment.

compliance and provides a detailed blueprint for how local governments can effectively use these tools. We also explore the implications of our findings in the context of existing cultural policy debates, making a unique contribution to the literature by bridging policy implementation and academic research.

Local governments may not fully attain the primary objectives that spending on culture is intended to achieve, such as establishing sustainable cities, promoting economic growth and decent work, mitigating inequality, preventing environmental degradation, attaining gender equality and fostering safe and inclusive cities, among others. However, the indirect benefits of culture have a cumulative impact through culturally-driven activities that effectively contribute to achieving the SDGs. In light of our research findings, local governments should rethink what kind of culture they are funding and redirect resources towards strengthening cultural heritage—both tangible and intangible—and creativity, as these elements may be drivers and enablers of SDG achievement. We believe that local governments may be spending resources on 'bread and circuses' to achieve short-term electoral success without paying attention to one of the main purposes of spending on culture, which is to raise public awareness about the sustainable future of their environment.

One possible explanation for the result obtained in *Education* is that when citizens of a municipality are more literate, they may be more aware of sustainability-related issues and can pressure local governments to comply with the SDGs. This result aligns with Lewis et al. (2019) and Reverte (2022). Therefore, we believe that it is essential that public entities at all levels take measures to support citizens' education and thus positively impact SDG achievement. In summary, the level of education of a municipality's population can have a significant impact on achieving the SDGs by strengthening the capacity to respond to external pressures (coercive isomorphism), facilitating good practices (mimetic isomorphism) and promoting norms and values consistent with sustainable development (normative isomorphism). This finding underscores the importance of education as a key enabler for achieving the SDGs at the local level.

Our findings concerning the municipality's size, measured by the number of inhabitants, align with Navarro-Galera et al. (2010), who propose that a larger population is advantageous for sustainability. Conversely, our results regarding population density indicate that higher population density negatively impacts SDG achievement. In this context, Puertas and Marti (2023) assert that population density can impede the implementation of sustainability policies. Similarly, our study concurs with De Juanes and Giner (2020) regarding unemployment. One plausible explanation is that unemployed individuals may pressure local governments to prioritise economic development over social and environmental concerns, potentially adversely affecting SDG fulfilment.

6 | CONCLUSIONS, IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH

This study provides a comprehensive analysis of the impact of culture and education on SDG achievement at the municipal level in Spain.

First, our findings suggest that spending on culture, particularly on popular events and festivals that could be described as 'bread and circuses', negatively impacts SDG achievement. This type of spending, aimed at short-term popularity, diverts resources that could be used for more sustainable and educational cultural initiatives. Instead of promoting awareness and action towards sustainability, such spending can foster a culture of consumerism and ephemeral entertainment, distancing communities from long-term development goals.

On the other hand, education has been shown to be a critical factor in achieving the SDGs. Municipalities with higher education levels show greater compliance with the SDGs. Education not only raises awareness of sustainability issues but also empowers citizens to

pressure local governments to implement sustainable policies. This finding reinforces the need for policies that strengthen education on sustainability issues from an early age.

Our analysis also shows that municipalities with larger populations and less population density tend to be more SDG-compliant. Population density, in particular, poses unique challenges for implementing sustainable policies due to the pressure it places on resources and public services. Similarly, unemployment rates negatively impact SDG compliance, as immediate economic needs may lead governments to prioritise economic development over social and environmental initiatives.

Surprisingly, political variables such as the ideology of the ruling party, political strength and the mayor's gender do not have a significant impact on SDG compliance. This suggests that socio-economic and educational factors may be more decisive than political considerations in promoting sustainability at the local level.

To effectively integrate culture into local policies and assess their impact, it is essential to establish clear monitoring and evaluation mechanisms. Local governments need to rethink how they allocate cultural resources, focusing more on projects that combine culture and sustainability and less on events that are only aimed at short-term popularity. In addition, it is crucial to increase spending on education and promote sustainability issues in the school curricula to raise awareness about these issues and foster a more engaged and knowledgeable citizenry.

There are, however, some limitations to this study. It focuses on a limited number of municipalities and a single year of analysis, which may not fully capture long-term trends. Future studies should consider a larger dataset and cover several years to validate and extend these findings. It would also be beneficial to explore more cultural and educational indicators, as well as to analyse each of the sustainability pillars and individual goals to better understand the underlying factors that facilitate or impede their achievement.

In conclusion, this study opens up new lines of research on how culture, beyond festivals and events, can be effectively integrated into sustainable development policies at the local level. Policymakers should take a more strategic view of culture and education, recognising their potential to transform communities and move towards global sustainability goals.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

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ENDNOTE

[1] Municipal data on the proportion of the population aged 25–64 with the highest level of education, ISCED 5 or 6, is not available for 2017, so the lags are for 2018 and 2016.

REFERENCES

Alisjahbana, A. S., Yusuf, A. A., Anna, Z., Hadisoemartom, P. F., Kadarisman, A., Maulana, N., Larasati, W., Ghina, A. A., & Rahma, M. (2018). *Menyongsong SDGS Kesiapan Daerah-daerah di Indonesia (Preparing Indonesian local governments in accomplishment of SDGs)*. Unpad Press.

Amran, A., & Devi, S. (2008). The impact of government and foreign affiliate influence on corporate social reporting: The case of Malaysia. *Managerial Auditing Journal*, *23*(4), 386–404. https://doi.org/10.1108/02686900810864327

Baltà Portolés, J., & Dragićevic Šešić, M. (2017). Cultural rights and their contribution to sustainable development: Implications for cultural policy. *International Journal of Cultural Policy*, *23*(2), 159–173.

Benhamou, F. (2010). L'impact économique et social des industries culturelles en France. *Revue d'Économie Industrielle*, *4*(132), 9–34.

Benito, B., Guillamón, M. D., & Bastida, F. (2015). Budget forecast deviations in municipal governments: Determinants and implications. *Australian Accounting Review*, *25*(1), 45–70.

Bervar, M., & Trnavčevič, A. (2019). Importance of culture for sustainable development. *Managing Global Transitions*, *17*(3), 197–209.

Beugelsdijk, S., & Welzel, C. (2018). Dimensions and dynamics of national culture: Synthesizing Hofstede with Inglehart. *Journal of Cross-Cultural Psychology*, *49*(10), 1469–1505.

Biermann, F., Kanie, N., & Kim, R. E. (2017). Global governance by goal-setting: The novel approach of the UN sustainable development goals. *Current Opinion in Environmental Sustainability*, *26*, 26–31.

Biermann, F., Sun, Y., Banik, D., Beisheim, M., Bloomfield, M. J., Charles, A., Chasek, P., Hickmann, T., Pradhan, P., & Sénit, C.-A. (2023). Four governance reforms to strengthen the SDGs. *Science*, *381*(6663), 1159–1160.

Bisogno, M., Cuadrado-Ballesteros, B., Rossi, F. M., & Peña-Miguel, N. (2023). Sustainable development goals in public administrations: Enabling conditions in local governments. *International Review of Administrative Sciences*, *89*(4), 1223–1242.

Bucci, A. (2015). Product proliferation, population, and economic growth. *Journal of Human Capital*, *9*, 170–197.

Caiza, L., Zegarra, G., Navarro, E., & Alvarez, F. (2021). *Comparación de indicadores de sostenibilidad entre zonas urbanas de Ecuador y España empleando imágenes Sentinel 2 MSI*. Tercer Congreso en Ingeniería Geomática.

Chaoqun, W. U. (2020). *How does culture connect and contribute to the sustainable development? A literature review*. Master's Thesis. Ritsumeikan Asia Pacific University. https://philarchive.org/archive/CHAHDC-2

Costa, J., Cancela, D., & Reis, J. (2021). Neverland or tomorrowland? Addressing (in) compatibility among the SDG pillars in Europe. *International Journal of Environmental Research and Public Health*, *18*(22), 11858.

Cuadrado-Ballesteros, B., Guillamón, M. D., & Ríos, A. M. (2022). Does gender matter in budget deviations? An empirical assessment of Spanish local governments. *Public Management Review*, *24*(10), 1521–1544.

Cusack, T. R. (1997). Partisan politics and public finance: Changes in public spending in the industrialized democracies, 1955–1989. *Public Choice*, *91*(3), 375–395.

Dalle Nogare, C. (2000). I governi di coalizione sono tutti "fiscally irresponsible"? Un'indagine empirica con l'utilizzo della cluster analysis. *Politica Economica*, *16*(1), 93–130.

De Juanes, Á., & Giner, J. M. (2020). El desarrollo sostenible en los municipios españoles: elaboración de un índice sintético (ISSDS). *Ekonomiaz*, *97*, 1° semestre 2020, 264–292.

Deegan, C. (2009). *Financial accounting theory*. McGraw Hill.

Dessein, J., Soini, K., Birkeland, I., Fairclough, G., Horlings, L., De Beukelaer, C., Matejic, J., Stylianou-Lambert, T., Mihaila, M., Spinozzi, P., Cicerchia, A., Johannisson, J., Kangas, A., Lapka, M., Dragicevic Sesic, M., Siivonen, K., Skjerven, A., Plebańczyk, K., Tomka, G., & Reimer, M. (2015). *Culture in, for and as sustainable*

development: Conclusions from the COST action IS1007 investigating cultural sustainability. University of Jyväskylä.

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited-institutional isomorphism and collective rationality in organizational field. *American Sociological Review*, *48*(2), 147–160.

Farashah, A., & Rezvani, Z. (2021). The Role of Political Ideology (Left vs Right) on Sustainable Consumption. *In the 27th Annual Conference, International Sustainable Development Research Society*. Virtual conference, Mid Sweden University. https://isdrs.org/2021-sweden/

Ferran Vila, S., Miotto, G., & Rodríguez, J. R. (2021). Cultural sustainability and the SDGs: Strategies and priorities in the European Union countries. *European Journal of Sustainable Development*, *10*(2), 73–90.

García-Sánchez, I. M., Frías-Aceituno, J. V., & Rodríguez-Domínguez, L. (2013). Determinants of corporate social disclosure in Spanish local governments. *Journal of Cleaner Production*, *39*, 60–72.

García-Sánchez, I. M., & Prado-Lorenzo, J. M. (2008). Determinant factors in the degree of implementation of local agenda 21 in the European Union. *Sustainable Development*, *16*(1), 17–34.

García-Sánchez, I. M., & Prado-Lorenzo, J. M. (2009). Decisive factors in the creation and execution of municipal action plans in the field of sustainable development in the European Union. *Journal of Cleaner Production*, *17*(11), 1039–1051.

Global Taskforce of Local and Regional Governments. (2016). *Roadmap for localising the SDGs: Implementation and monitoring at subnational level*. https://sustainabledevelopment.un.org/content/documents/commitments/818_11195_commitment_ROADMAP%20LOCALIZING%20SDGS.pdf

Government of Spain. (2018a). *Informe de España para el examen nacional voluntario 2018*. Gobierno de España.

Government of Spain. (2018b). *Plan de Acción para la implementación de la Agenda 2030. Hacia una Estrategia Española de Desarrollo Sostenible*. Centre for Global Education.

Government of Spain. (2019). *Gobierno de España; Ministerio de Fomento Agenda Urbana Española*. Gobierno de España. http://www.aue.gob.es/

Government of Spain. (2021). *Estrategia de desarrollo sostenible 2030. Un proyecto de país para hacer realidad la agenda 2030*. Ministerio de Derechos Sociales y Agenda.

Greenfield, P. M. (2016). Social change, cultural evolution, and human development. *Current Opinion in Psychology*, *8*, 84–92.

Grin, E. J. (2022). *Capacidades estatales municipales en Brasil y resultados de la implantación de los ODS*. IX Encontro de Administração Pública da ANPAD VI.

Grover, P., Kar, A. K., Gupta, S., & Modgil, S. (2021). Influence of political leaders on sustainable development goals—Insights from twitter. *Journal of Enterprise Information Management*, *34*(6), 1893–1916.

Guarini, E., Mori, E., & Zuffada, E. (2021). New development: Embedding the SDGs into city strategic planning. *Public Money and Management*, *41*(6), 494–497.

Guarini, E., Mori, E., & Zuffada, E. (2022). Localizing the sustainable development goals: A managerial perspective. *Journal of Public Budgeting, Accounting & Financial Management*, *34*(5), 583–601.

Guha, J., & Chakrabarti, B. (2019). Achieving the sustainable development goals (SDGs) through decentralisation and the role of local governments: A systematic review. *Commonwealth Journal of Local Governance*, *22*, 1–21.

Guimarães, A. S. (2022). Los sistemas tributarios en América Latina: Una propuesta analítica desde la sociología fiscal. In E. Torres & J. M. Domingues (Eds.), *Nuevos actores y cambio social en América Latina* (pp. 351–374). CLACSO.

Hibbs, D. A. (1977). Political parties and macroeconomic policy. *American Political Science Review*, *71*(4), 467–487.

Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind* (3rd revised ed.). McGraw-Hill.

Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online Readings in Psychology and Culture*, *2*(1), 1–26. https://doi.org/10.9707/2307-0919.1014

Hofstede, G., Hofstede, G. J., & Minkov, M. (2005). *Cultures and organizations: Software of the mind* (Vol. 2). McGraw-Hill.

Husted, B. W. (2005). Culture and ecology: A CrossNational study of the determinants of environmental performance. *Management International Review*, *45*(3), 349–371.

Iizuka, M. (2016). *Role of environmental awareness in achieving sustainable development*. Economic Commission for Latina America and the Caribbean. https://repositorio.cepal.org/handle/11362/31562

Inglehart, R. (1997). *Modernization and post modernization: Cultural, economic, and political change in 43 societies*. Princeton University Press.

Kagan, S., Hauerwaas, A., Holz, V., & Wedler, P. (2018). Culture in sustainable urban development: Practices and policies for spaces of possibility and institutional innovations. *City, Culture and Society*, *13*, 32–45.

Krantz, V., & Gustafsson, S. (2023). Regional collaboration for the sustainable development goals: Experiences from developing a multi-actor platform in Sweden. *Sustainable Development*, *31*(6), 4007–4018.

Kroll, C., Warchold, A., & Pradhan, P. (2019). Sustainable development goals (SDGs): Are we successful in turning trade-offs into synergies? *Palgrave Community*, *5*, 140.

León-Silva, J. M., Dasí-González, R. M., & Montesinos Julve, V. (2022). Determinants of sustainability information disclosure of local governments in Latin America. *Revista de Contabilidad—Spanish Accounting Review*, *25*(2), 244–256.

Lesnikowski, A., Biesbroek, R., Ford, J. D., & Berrang-Ford, L. (2021). Policy implementation styles and local governments: The case of climate change adaptation. *Environmental Politics*, *30*(5), 753–790.

Lewis, G. B., Palm, R., & Feng, B. (2019). Cross-national variation in determinants of climate change concern. *Environmental Politics*, *28*(5), 793–821.

Loach, K., Rowley, J., & Griffiths, J. (2017). Cultural sustainability as a strategy for the survival of museums and libraries. *International Journal of Cultural Policy*, *23*(2), 186–198.

McCright, A. M., Dunlap, R. E., & Marquart-Pyatt, S. T. (2016). Political ideology and views about climate change in the European Union. *Environmental Politics*, *25*(2), 338–358.

Mehmood, U. (2021). Contribution of renewable energy towards environmental quality: The role of education to achieve sustainable development goals in G11 countries. *Renewable Energy*, *178*, 600–607.

Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, *83*(2), 340–363.

Moallemi, E. A., Malekpour, S., Hadjikakou, M., Raven, R., Szetey, K., Ningrum, D., Dhiaulhaq, A., & Bryan, B. A. (2020). Achieving the sustainable development goals requires transdisciplinary innovation at the local scale. *One Earth*, *3*, 300–313.

Moyer, J. D., & Bohl, D. K. (2019). Alternative pathways to human development: Assessing trade-offs and synergies in achieving the sustainable development goals. *Futures*, *105*, 199–210.

Mutiarani, N. D., & Siswantoro, D. (2020). The impact of local government characteristics on the accomplishment of sustainable development goals (SDGs). *Cogent Business & Management*, *7*(1), 1847751.

Nagy, J. A., Benedek, J., & Ivan, K. (2018). Measuring sustainable development goals at a local level: A case of a metropolitan area in Romania. *Sustainability*, *10*(11), 3962.

Navarro-Galera, A., Alcaraz-Quiles, F. J., & Zafra, J. L. (2010). La divulgación de información sobre responsabilidad corporativa en administraciones públicas: Un estudio empírico en gobiernos locales. *Revista de Contabilidad-Spanish Accounting Review*, *13*, 285–314.

Navarro-Galera, A., Ruiz-Lozano, M., Tirado-Valencia, P., & de los Ríos-Berjillos, A. (2017). Promoting sustainability transparency in European local governments: An empirical analysis based on administrative cultures. *Sustainability*, *9*(3), 432.

Nicolò, G., Andrades-Peña, F. J., Ferullo, D., & Martinez-Martinez, D. (2023). Online sustainable development goals disclosure: A comparative study in Italian and Spanish local governments. *Business Ethics, the Environment & Responsibility*, *32*(4), 1490–1505.

Nicolò, G., L'Abate, V., Raimo, N., & Vitolla, F. (2024). Exploring the antecedents of local governments' sustainability disclosure: The role of the mayor. *Journal of Public Affairs*, *24*(1), e2908.

Nurse, K. (2006). Culture as the fourth pillar of sustainable development. *Small States: Economic Review and Basic Statistics*, *11*, 28–40.

OECD. (2020). *A territorial approach to the sustainable development goals: Synthesis report*. OECD Publishing. https://www.oecd-ilibrary.org/urban-rural-and-regional-development/aterritorial-approach-to-the-sustainable-development-goals_e86fa715-en

Oosterhof, P. D. (2018). *Localising the sustainable development goals to accelerate implementation of the 2030 agenda for sustainable development*. ADB, the Government Brief, issue 33.

Ordonez-Ponce, E. (2023). The role of local cultural factors in the achievement of the sustainable development goals. *Sustainable Development*, *31*(2), 1122–1134.

Ortiz-Moya, F., & Kataoka, Y. (2022). *State of the voluntary local reviews 2022: Overcoming barriers to implementation*. Research report. Institute for Global Environmental Strategies (IGES).

Ortíz-Rodríguez, D., Navarro-Galera, A., & Alcaraz-Quiles, F. J. (2018). The influence of administrative culture on sustainability transparency in European local governments. *Administration & Society*, *50*(4), 555–594.

Palermo, V., Bertoldi, P., Apostolou, M., Kona, A., & Rivas, S. (2020). Assessment of climate change mitigation policies in 315 cities in the covenant of mayors initiative. *Sustainable Cities and Society*, *60*, 102258.

Park, H., Russell, C., & Lee, J. (2007). National culture and environmental sustainability: A cross-national analysis. *Journal of Economics and Finance*, *31*(1), 104–121.

Pipa, A. F. (2019). Shaping the global agenda to maximize city leadership on the SDGs: The experiences of vanguard cities. *Global Economy and Development*, 1–11. https://www.brookings.edu/wp-content/uploads/2019/06/City-leadership-on-the-SDGs.pdf

Prado-Lorenzo, J. M., García-Sánchez, I. M., & Cuadrado-Ballesteros, B. (2012). Sustainable cities: Do political factors determine the quality of life? *Journal of Cleaner Production*, *21*(1), 34–44.

Puertas, R., & Marti, L. (2023). Regional analysis of the sustainable development of two Mediterranean countries: Spain and Italy. *Sustainable Development*, *31*(2), 797–811.

Rahaman, A. S., Lawrence, S., & Roper, J. (2004). Social and environmental reporting at the VRA: institutionalised legitimacy or legitimation crisis? *Critical Perspectives on Accounting*, *15*(1), 35–56. https://doi.org/10.1016/S1045-2354(03)00005-4

Rahman, M. M., & Alam, K. (2021). Clean energy, population density, urbanization and environmental pollution nexus: Evidence from Bangladesh. *Renewable Energy*, *172*, 1063–1072.

Raimo, N., L'Abate, V., Rella, A., & Vitolla, F. (2024). The use of social media in Italian local governments: The effect of the mayor's characteristics. *Cities*, *150*, 105070.

Raimo, N., Nicolò, G., L'Abate, V., & Vitolla, F. (2024). Analyzing the factors affecting university contributions to achieving the sustainable development goals in European Union countries. *Sustainable Development*, *32*(6), 6033–6044. https://doi.org/10.1002/sd.3013

Raimo, N., Rubino, M., Esposito, P., & Vitolla, F. (2023). Measuring quality of popular annual financial reports: Features of the rewarded US reporting municipalities. *Corporate Social Responsibility and Environmental Management*, *30*(1), 17–27.

Rayman-Bacchus, L., & Radavoi, C. N. (2020). Advancing culture's role in sustainable development: Social change through cultural policy. *International Journal of Cultural Policy*, *26*(5), 649–667.

Reverte, C. (2022). The importance of institutional differences among countries in SDGs achievement: A cross-country empirical study. *Sustainable Development*, *30*(6), 1882–1899.

Rieiro-García, M., Aibar-Guzmán, C., & Aibar-Guzmán, B. (2023). The 2030 agenda in local entities: Does gender matter in reporting on the sustainable development goals? *Cities*, *141*, 104461.

Rieiro-García, M., Amor-Esteban, V., & Aibar-Guzmán, C. (2023). 'Localizing' the sustainable development goals: A multivariate analysis of Spanish regions. *AIMS Environmental Science*, *10*(3), 356–381.

Ríos, A. M., Guillamón, M. D., Cifuentes-Faura, J., & Benito, B. (2022). Efficiency and sustainability in municipal social policies. *Social Policy & Administration*, *56*(7), 1103–1118.

Ríos, A. M., Guillamón, M. D., & Benito, B. (2022). What factors make a municipality more involved in meeting the sustainable development goals? Empirical evidence. In *44th Annual congress of the European Accounting Association*. Bergen (Norway). 11–13 de mayo de 2022.

Roubini, N., & Sachs, J. D. (1989a). Political and economic determinants of budget deficits in the industrial democracies. *European Economic Review*, *33*(5), 903–933.

Roubini, N., & Sachs, J. D. (1989b). Government spending and budget deficits in the industrial countries. *Economic Policy*, *4*(8), 99–132.

Sabatini, F. (2019). Culture as fourth pillar of sustainable development: Perspectives for integration, paradigms of action. *European Journal of Sustainable Development*, *8*(3), 31.

Sánchez de Madariaga, I., del Álamo, J. B., García López, J., Sisto, R., & Urquijo, J. (2020). *Los Objetivos de Desarrollo Sostenible en 100 Ciudades Españolas*. REDS (SDSN-Spain).

Sarkar, M. S. K., Okitasari, M., Ahsan, M. R., & Al-Amin, A. Q. (2022). Localisation of sustainable development goals (SDGs) in Bangladesh: An inclusive framework under local governments. *Sustainability*, *14*(17), 10817.

Schwartz, S. H. (2004). Mapping and interpreting cultural differences around the world. In H. Vinken, J. Soeters, P. Ester, H. Vinken, J. Soeters, & P. Ester (Eds.), *Comparing cultures, dimensions of culture in a comparative perspective* (pp. 43–73). Brill.

Sedita, S. R., Blasi, S., & Yang, J. (2022). The cultural dimensions of sustainable development: A cross-country configurational analysis. *Sustainable Development*, *30*(6), 1838–1849.

Sisto, R., García López, J., Quintanilla, A., De Juanes, Á., Mendoza, D., Lumbreras, J., & Mataix, C. (2020). Quantitative analysis of the impact of public policies on the sustainable development goals through budget allocation and indicators. *Sustainability*, *12*(24), 10583.

Spanish Ministry of Culture. (2022). *Statistics on financing and public expenditure on culture*. Spanish Ministry of Culture.

UCLG. (2015). *The sustainable development goals: What local governments need to know*. United Cities And Local Governments. https://www.uclg.org/sites/default/files/the_sdgs_what_localgov_need_to_know_0.pdf

UNDP. (2013). *Human development report 2013: The rise of the south: Human progress in a diverse world*. http://hdr.undp.org/en/indicators/137506

UNESCO. (2005). *Convention on the protection and promotion of the diversity of cultural expressions*. http://portal.unesco.org/en/ev.php-URL_ID=31038&URL_DO=DO_TOPIC&URL_SECTION=201.html

UNESCO. (2012). *Culture: A driver and an enabler of sustainable development*. Thematic Think Piece. UN System Task Team on the Post-2015 UN Development Agenda.

UNESCO. (2013). *Declaración de Hangzhou. Situar la cultura en el centro de las políticas de desarrollo sostenible*. http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ.CLT/pdf/final_hangzhou_declaration_spanish.pdf

United Cities and Local Governments. (2015). *Culture 21: Actions*. https://www.agenda21culture.net/sites/default/files/files/documents/multi/c21_015_en_0.pdf

United Cities and Local Governments-Committee on Culture. (2004). *Agenda 21 for culture*. https://www.agenda21culture.net/documents/agenda-21-for-culture

United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development*. Resolution adopted by the General Assembly on 25 September 2015. A/RES/70/1. United Nations.

Varela, F., Álvarez, B., & Cortés, J. (2020). *Guide to the localisation of the 2030 agenda. FEMP, Federación Española de Municipios y Provincias*. Ministerio de Derechos Sociales y Agenda 2030.

Waldman, D., Sully de Luque, M., Washburn, N., House, R. J., Adetoun, B., Barrasa, A., Bobina, M., Bodur, M., Chen, Y. J., Debbarma, S., Dorfman, P., Dzuvichu, R. R., Evcimen, I., Fu, P., Grachev, M., Duarte, R. G., Gupta, V., Den Hartog, D. N., De Hoogh, A. H. B., … Wilderom, C. P. M. (2006). Cultural and leadership predictors of corporate social responsibility values of top management: A GLOBE study of 15 countries. *Journal of International Business Studies*, *37*(6), 823–837. https://doi.org/10.1057/palgrave.jibs.8400230

Wang, H., Guo, T., & Tang, Q. (2021). The effect of national culture on corporate green proactivity. *Journal of Business Research*, *131*, 140–150.

Wang, N., & Ma, M. (2021). Public–private partnership as a tool for sustainable development—What literatures say. *Sustainable Development*, *29*(1), 243–258.

Yildirim, E., Baltà Portolés, J., Pascual, J., Perrino, M., Llobet, M., Wyber, S., Phillips, P., Gicquel, L., Martínez, R., Miller, S., & Guerra, C. (2019). *Culture in the implementation of the 2030 agenda: A report by the culture 2030 goal campaign*. https://www.agenda21culture.net/sites/default/files/culture2030goal_en_exres.pdf

Yildirim, E., Pascual, J., Llobet, M., Wyber, S., Fisher, S., & Caballero, G. (2021). Culture in the localization of the 2030 agenda: An analysis of voluntary local reviews. In *Culture 2030 goal campaign, 4th UCLG culture summit*, 9–11 September 2021.

Zheng, X., Wang, R., Hoekstra, A. Y., Krol, M. S., Zhang, Y., Guo, K., Sanwal, M., Sun, Z., Zhu, J., Zhang, J., Lounsbury, A., Pan, X., Guan, D., Hertwich, E. G., & Wang, C. (2021). Consideration of culture is vital if we are to achieve the sustainable development goals. *One Earth*, *4*(2), 307–319.

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APPENDIX A: LIST OF MUNICIPALITIES GROUPED BY REGION AND PROVINCE

Region	Province	Municipality
Andalucía	Almería	Almería
		El Ejido
		Roquetas de Mar
	Cádiz	Jerez de la Frontera
		El Puerto de Santa María
		Cádiz
		Algeciras
		Chiclana de la Frontera
		San Fernando
	Córdoba	Córdoba
	Granada	Granada
	Huelva	Huelva
	Jaén	Jaén
	Málaga	Málaga
		Mijas
		Marbella
		Fuengirola
		Vélez-Málaga
	Sevilla	Dos Hermanas
		Sevilla
Aragón	Zaragoza	Zaragoza
Asturias	Asturias	Avilés
		Gijón
		Oviedo
Canarias	Las Palmas	Telde
		Las Palmas de Gran Canaria
	Santa Cruz de Tenerife	Santa Cruz de Tenerife
		San Cristóbal de La Laguna
		Arona
Cantabria	Santander	Santander
Castilla-La Mancha	Albacete	Albacete
	Ciudad Real	Ciudad Real
	Cuenca	Cuenca
	Toledo	Toledo
		Talavera de la Reina
Castilla-León	Ávila	Ávila
	Burgos	Burgos
	Palencia	Palencia
	Salamanca	Salamanca
	Segovia	Segovia
	Valladolid	Valladolid
	Zamora	Zamora
Cataluña	Barcelona	Mataró
		Cornellá de Llobregat
		San Cugat del Vallés
		Sabadell
		Hospitalet de Llobregat
		Tarrasa
		Badalona
		Barcelona
		San Baudilio de Llobregat
		Santa Coloma de Gramanet
	Girona	Girona
	Lleida	Lleida
	Tarragona	Tarragona
		Reus
Ceuta	Ceuta	Ceuta
Comunidad Valenciana	Alicante	Torrevieja
		Alicante
	Castellón	Castellón de la Plana
	Valencia	Torrent
		Valencia
Extremadura	Badajoz	Badajoz
	Cáceres	Cáceres
		Mérida
Galicia	La Coruña	La Coruña
		Santiago de Compostela
	Lugo	Lugo
	Orense	Orense
	Pontevedra	Pontevedra
		Vigo
Logroño	Logroño	Logroño
Madrid	Madrid	Coslada
		Leganés
		Rivas-Vaciamadrid
		Fuenlabrada
		Pozuelo de Alarcón
		Madrid
		Móstoles
		Alcalá de Henares
		Torrejón de Ardoz
		Las Rozas de Madrid
		San Sebastián de los Reyes
		Getafe
Melilla	Melilla	Melilla
Murcia	Murcia	Cartagena
		Murcia
		Lorca

(Continues)

APPENDIX B: ROBUSTNESS ANALYSIS

In this section, a series of robustness tests have been carried out to confirm and validate the results obtained in the previous analyses.

To consider the temporal effect, we have performed a first robustness analysis by introducing the average value of culture expenditure (*Average_Culture Expend*) and unemployment (*Average_Unemployment*) for the period 2015–2020 (instead of using the 2019 data). For the political variables, we have continued taking the data from the 2015 elections. Finally, for the remaining variables, we have adopted the 2019 data since these are variables change little over time. The results (Table B1) confirm the conclusions of our analysis.

Given that two municipal elections took place in Spain during the period 2015–2020 (2015 and 2019), we constructed two new variables to check whether the change in local government structure is a relevant factor or, as previously found, political variables do not influence SDG achievement at the municipal level. Specifically, we conducted a second robustness analysis in which, instead of the mayor's ideology and gender, we introduced a possible change in political ideology (*Change_Ideology*) and the mayor's gender (*Change_Gender*) between the 2015 and 2019 elections and their interaction (*Change_Ideology * Change_Gender*). *Change_Ideology* takes the value 1 if there has been a change in the ideology of the governing party and 0 otherwise, and *Change_Gender* if there has been a change in the gender of the mayor of the city. As seen in Table B2, the results are generally the same as those discussed above.

TABLE B1 Results of the OLS (robustness analysis 1).

	Model 1: *SDG_total*		Model 2: *SDG_Excl_Climate_Ocean*	
	Coefficient	**Std. err.**	**Coefficient**	**Std. err.**
Average_Cultural expend	−0.3415*	0.1769	−0.2548	0.1640
Education	0.1228***	0.0406	0.1347***	0.0376
Lnpopulation	1.3012**	0.5172	0.8246*	0.4794
Density	−0.0002**	0.0001	−0.0003***	0.0001
Average_Unemployment	−0.2467***	0.0733	−0.3731***	0.0679
Ideology	0.8556	0.7394	0.3580	0.6853
Strength	−7.2867	6.3191	−2.9648	5.8569
Gender	0.1784	0.7514	−0.0502	0.6964
Constant	36.1159***	6.8143	42.7480***	6.3160
Adj *R*-squared	.3493		.5044	
N	89		89	

*, **, and *** denote significant at 10%, 5%, and 1% levels, respectively.

TABLE B2 Results of the OLS (robustness analysis 2).

	Model 1: *SDG_total*		Model 2: *SDG_Excl_Climate_Ocean*	
	Coefficient	**Std. err.**	**Coefficient**	**Std. err.**
Average_Cultural expend	−0.3043*	0.1767	−0.1973	0.1621
Education	0.1210***	0.0402	0.1253***	0.0369
Lnpopulation	1.0727**	0.5060	0.6239	0.4679
Density	−0.0002**	0.0001	−0.0003***	0.0001
Average_Unemployment	−0.2574***	0.0724	−0.3859***	0.0665
Change_Ideology	−0.8463	2.6440	−2.4891	2.4265
Strength	−5.6812	6.1325	−2.6106	5.6281
Change_Gender	−1.5992	1.4833	−2.3918*	1.3613
*Change_Ideology * Change_Gender*	−0.2757	2.7522	1.8108	2.5258
Constant	40.9712***	7.1490	48.0551***	6.5609
Adj *R*-squared	.3745		.5329	
N	89		89	

*, **, and *** denote significant at 10%, 5%, and 1% levels, respectively.