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Cultural Diversity and Urban Features: An Australian Case Study

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Abstract

Cultural diversity is a key part of the Australian identity, and how this diversity interacts with urban features is useful for diversity research, urban planning and strategic policy intervention. This case study explores the relationship between cultural diversity and the urban landscape, focusing on Statistical Area Level 4 (SA4) regions of Australia. The data were obtained from the 2021 Australian Census. The study calculated cultural diversity indices for religion/worldview, language and country of birth for each region. Spearman's correlations were used as a framework to understand the relationship between diversity and urban parameters. The research revealed relationships between cultural diversity and economic indicators, social disorganisation and the ratio of low income to high income households within particular regions. Further, the study identified anomalies that deviate from conventional trends. This study lays a promising foundation for future research into cultural diversity in a socio-spatial context and highlights the need to understand cultural diversity within its broader context.

Keywords

Cultural Diversity, Urban Features, Socio-Spatial

1. Introduction

Cultural diversity has gained increasing recognition and importance, particularly in the context of expanding globalisation and multiculturalism. This is especially relevant in Australia, a highly multicultural nation, where more than a quarter of the population (27.6%) is born overseas (Australian Bureau of Statistics, 2022). Australia is seen as a successful multicultural country, with cultural diversity a fundamental characteristic of its national identity (Elias, Mansouri, & Sweid,

2020). The widespread support for multiculturalism in Australia, both politically and institutionally (Australian Human Rights Commission, 2017), coupled with the general population expressing positive sentiment for multiculturalism, suggests the potential for improvement through strategic policy innovation (Elias, Mansouri, & Sweid, 2020).

Accompanying the growth of cultural diversity worldwide is a greater need for understanding its intricacies within the social landscape. The interplay between cultural diversity and the socio-spatial landscape not only informs the relationship between diversity and urban parameters but also lays the foundation for further investigation into areas of interest and potential mediating factors.

Cultural diversity within a spatial context can be both an indicator of and influenced by the social landscape. Therefore, investigating the relationship that exists between diversity and urban parameters is important to reveal meaningful connections between these entities. This research is valuable for the general public, urban planners, diversity researchers and policymakers in helping them effectively address the needs of diverse populations while aligning with broader policy objectives and infrastructure requirements.

The main aim of this study is to identify the existence and nature of relationships between cultural diversity and urban parameters. Additionally, the study aims to identify trends and deviations from established patterns.

The scope of the study extends to the Statistical Area 4 (SA4) regions of Australia, where cultural diversity parameters are compared with the overall trends of their respective states, examining associations with urban parameters such as employment, median income and rental prices.

Problem Statement

The relationship between cultural diversity and vital urban parameters, specifically housing prices and income disparity, is not well understood and this lack of understanding negatively affects policy decisions, including urban planning strategies. This study, though confined to the Australian context, underscores the need to unravel the complexities inherent in the interplay between cultural diversity and urban features for the improvement of societal understanding and policymaking.

2. Literature Review

2.1. Defining Cultural Diversity

Finding a consistent definition of cultural diversity is difficult due to the varied interpretations that abound, particularly in the specific contexts in which the term is employed. The variability in definitions can be attributed to the inherent complexities within the term "culture", which relies on context and defies simplistic definition. Independent of specific cultural context, culture can be delineated as the convergence of expectations, roles and rules within a group, shaped by categorisations made by both in-group and out-group members, and these categorisations are usually based on nationality, race and ethnicity (Earley &

Mosakowski, 2000). Concurrently, diversity is the presence of socially meaningful differences among members of a dyad or group (Cunningham, 2019).

In a broader sense, cultural diversity generally refers to the coexistence of diverse capabilities of humans, such as knowledge, beliefs, arts, customs, religions, languages, ethnicities, nationalities and sexual orientations (Gomez & Bernet, 2019), which points to the all-encompassing nature of cultural diversity, and to the expressions of culture that can be extremely distinctive at a community and individual level. This broad idea of cultural diversity can make cultural diversity difficult to study at a micro-level. Empirical literature investigating cultural diversity has usually been limited to a single component, such as ethnic diversity (Churchill & Smyth, 2020; Steele et al., 2022), allowing for insight into how a particular facet of cultural diversity relates to a specific attribute. Within a socio-spatial context, Piekut and colleagues (Piekut et al., 2012) highlight how this gives limited insight into the full diversity of urban spatial communities. Instead, they emphasise the exploration of different facets of diversity.

Recent literature emphasises the multidimensional nature of cultural diversity (Godfrey et al., 2019; Piekut et al., 2012), delving into its representation around pillars of ethnicity, language and worldview (Moieni, Mousaferiadis, & Sorezano, 2017) and, more recently, country of birth (Moieni & Mousaferiadis, 2022). Country of birth has often been used as a proxy for ethnicity (Moieni, Mousaferiadis, & Sorezano, 2017), which ignores the complexities of defining and measuring ethnicity. Country of birth is now recognised as its own facet of cultural diversity. By distilling the concept of cultural diversity into key pillars, the most salient components are brought to the fore, allowing for a meaningful, in-depth analysis of cultural diversity without the interference of less important facets of diversity.

2.2. Importance of Cultural Diversity

UNESCO described cultural diversity as "a living and renewable treasure that is as necessary to humankind as biodiversity is for nature" (UNESCO, 2023), which shows the crucial role of cultural diversity in shaping and enriching a society. In Australian context, research conducted by Australian Human Rights Commission (2024) found that over 48% of Australia's population have a parent born overseas and 1 in 5 Australians speaks language other than English at home. While Australia has a rich ancestral cultures and languages, more than 1.2 million Australians had experienced social exclusion from income poverty and unemployment (Horn, Scutella, & Wilkins, 2011). This is not just about financial difficulties but extends to a sense of disconnection from the broader community. Cultural diversity therefore not only enriches the society, but also has a role in addressing social exclusion by increasing tolerance and challenging stereotypes among individuals (Crisp & Turner, 2011). By giving exposure to different ethnicities and languages, it could then foster cross-cultural understanding and communications among people in the region, promoting a more inclusive and open society.

The benefits of cultural diversity have been widely investigated, with research suggesting greater cultural diversity leads to improved performance within various social contexts, including organisations (Moieni, Mousaferiadis, & Pateel, 2022), workplaces (Chrobot-Mason & Aramovich, 2013), healthcare (Gomez & Bernet, 2019), and sports (Godfrey et al., 2019). This diversity fosters improved ideas, heuristics, perspectives and skills, and has been linked to the economic prosperity of regions through policies that prioritise creativity (Yong, 2019). The benefits of cultural diversity stem from the unique nature of diverse groups, providing access to a range of knowledge and enhancing creative problem solving (Cox, Lobel, & McLeod, 1991).

However, the literature also suggests drawbacks of cultural diversity. In an organisational context, a recent meta-analysis found evidence of diversity leading to poorer team performance (Jehn & Mannix, 2001), less effective team functioning, and becoming a source of friction and conflict (Stahl & Maznevski, 2021). This meta-analysis emphasises the "double-edged sword" nature of cultural diversity, which can be a source of conflict and synergy, presenting simultaneous challenges and opportunities for learning. The findings highlight the need for a contemporary understanding of cultural diversity and its present-day impact.

2.3. Cultural Diversity in a Spatial Context

Understanding cultural diversity within a specific socio-spatial area allows for better policy and infrastructure that caters to the specific needs of a diverse population. However, the literature on cultural diversity in a socio-spatial context is sparse. Empirical studies have generally focused on cities in Westernised nations (Churchill & Smyth, 2020; Piekut et al., 2012; Vertovec et al., 2023). Ghazaie and colleagues (Ghazaie, Rafieian & Dadashpoor, 2019) went some way to bridging this gap by exploring diversity and influencing factors in Tehran, Iran. However, the empirical literature has been confined to city-wide data, and usually only investigates a select few urban features, such as population density.

Cultural diversity within a spatial context can be due to many factors, with a focus on Australia, including immigration, socio-economic conditions, and political development:

- *Immigration*: It is one of the main factors that brings people from different languages, worldviews, countries of birth, and cultures into Australian society. Australia has a rich history of migration, with over 29% of Australians was born overseas (Australian Human Rights Commission, 2024).
- *Socio-economic conditions*: Research suggested lower-income regions often host first and second-generation migrants, where poor social cohesion with the major communities may exist (Syrett & Sepulveda, 2011).
- *Political development*: Australian government recognise multiculturalism as "mutual obligations between government, the community, and the individual" (Australian Government, 2017). More ethnically and linguistically diverse politicians were elected into parliament (Clure, 2022), which could represent

diverse groups in society and encourage policies that benefit people from different backgrounds, shaping cultural diversity.

It is important to broaden the scope of our understanding by going beyond city boundaries for a more holistic understanding of cultural diversity and its interplay with the socio-spatial landscape.

2.4. First Study of Its Kind

Reviewing the literature shows that studies related to cultural diversity in socio-spatial contexts are limited to city-wide data. There is no regional or nationwide analysis of cultural diversity for any nation in the world. Furthermore, to our knowledge, no prior literature has undertaken a comprehensive review of cultural diversity within a socio-spatial context, exploring multiple facets of cultural diversity and how they relate to urban parameters of the area.

While prior studies have investigated isolated urban parameters with a singular focus on one pillar of diversity (Churchill & Smyth, 2020; de Soysa & Noel, 2018; Steele et al., 2022), there is an absence of studies investigating multiple urban parameters through a multifaceted cultural diversity lens. This study is therefore a first of its kind, a comprehensive analysis centred around the pillars most pertinent to cultural diversity, investigating their relationship with urban parameters. Additionally, this study aims to identify trends or anomalies in the data.

3. Methodology

This section outlines the method of data collection and analysis applied in the study. The primary objective of this case study was to explore the relationship between urban features and diversity indicators within the Statistical Area Level 4 (SA4) regions of Australia, with an emphasis on assessing the relationship between urban planning parameters and cultural diversity pillars of country of birth, language and worldview/religion. The ethnicity pillar was excluded from the study due to unavailability of data. Data relevant to the abovementioned cultural diversity pillars and urban parameters collated in **Table 1** was sourced from the 2021 Australia Census data, which is collected by the Australian Bureau of Statistics (2021) for each SA4 region. (Note that the Census is compulsory for everyone in Australia, including international visitors and students, only excluding foreign diplomats and their families.) Where applicable, data was extracted in a percentage format, to ensure it was normalised and comparable. The final dataset comprised 108 SA4 regions earmarked for analysis.

To measure cultural diversity, this study employed Simpson's (1949) Diversity Index to establish an index for each diversity measure within each SA4 region. This choice was informed by its previous application in a comparable study (Piekut et al., 2012) and its suitability for use across all three metrics of diversity. Simpson's Diversity Index is a mathematical measure of species diversity in a community and is denoted by the following equation:

$$D = 1 - \frac{\sum n(n-1)}{N(N-1)} \quad (1)$$

A higher number on the diversity index signifies greater diversity within the population. During the computation of religious diversity, some data had to be aggregated for more reliable analysis. For example, the Census represents Christianity with 19 sects, and including each sect as a distinct religion would greatly inflate the religious diversity within the dataset but would not accurately portray the religious diversity within the spatial area. Therefore, the decision was made to consolidate sects to represent the entire religion.

Income inequality, as an urban parameter, was measured using an income ratio, which is a standard metric for comparing the income distribution of household positions (Fletcher & Guttmann, 2013). A typical ratio examines the percentage of households earning below a low weekly income compared to the percentage of households earning a high weekly income. To approximate a customised index, a variable called income disparity was calculated as follows: the logarithm of 100 times the percentage of households with a weekly income < $800 divided by the percentage of households with a weekly income ≥ $3000. This index functions as a ratio of low-income to high-income households. A higher income disparity number indicates a greater presence of low-income households, while a lower number indicates fewer low-income households. It is important to note this singular measure of inequality provides only a partial picture of inequality and is one of many ways to measure this concept.

Another urban parameter, the Social Disorganization Index (SDI), was obtained by using an aggregate of other parameters. SDI aligns with Social Disorganization Theory, which posits that concentrated poverty, high residential mobility and ethnic diversity weaken social networks, norms and value systems required for informal control, leading to higher rates of crime (Shaw & McKay, 1942). Recent additions to this theory have identified additional important processes underlying social disorganization, including family disruption, the nature of local friendship networks, the presence of unsupervised groups and low organizational participation (Sampson, 1987; Sampson & Groves, 1989). Previous literature has created tailored indices to represent SDI, using the variables from Social Disorganization Theory (Snowden & Freiburger, 2015; Price et al., 2020; Trepka et al., 2021). This study created a tailored SDI with the data available in the Australian Census relating to Social Disorganization Theory. The variables used for the index were as follows:

- Family disruption
- Education
- Income disparity

Consistent with established literature, the SDI index was computed by summing the standardised scores of the variables and dividing the result by three (Snowden & Freiburger, 2015).

Table 1. Urban parameters extracted.

Domain	Parameter
Economic	• Median weekly income • Median weekly mortgage • Median rent
Employment	• Unemployed • Employed full-time • Employed part-time
Travel to work	• Car • Public transport
Family disruption	• Separated • One parent family • Divorced • Widowed
Education	No education
Income disparity	Income disparity index
Social disorganization	Social Disorganization Index

Due to the non-normal distributions and monotonic relationships present within the data, Spearman's correlation was used as a non-parametric test for analysing the data. The Spearman index was employed as the preferred statistical approach for examining the connections between the variables. Its proficiency at identifying monotonic relationships as it assesses both the strength and direction of non-linear associations aligns with patterns observed in the dataset. This choice ensured the analysis effectively captured and quantified the fundamental trends linking urban planning parameters and cultural diversity indices, thereby establishing a robust foundation for conclusions.

To assess the statistical significance of the observed correlations among the attributes, Spearman's rho (ρ) Test was performed. The test involved calculating Spearman's ρ for each pair of variables, producing correlation coefficients that quantified both the strength and direction of non-linear associations. The purpose was to evaluate whether the observed relationships held statistical significance beyond mere chance.

Following trend detection, new datasets were curated by selecting attributes that exhibited strong, significant correlations with the cultural diversity indices. These datasets were constructed to encompass individual attributes in conjunction with the diversity indices, thereby facilitating a precise and focused analysis of the impact of specific attributes on diversity metrics. The Isolation Forest algorithm, renowned for its ability to find anomalies efficiently within high-dimensional data, was employed to identify any outliers within these newly created datasets. The Isolation Forest algorithm efficiently isolates anomalies within complex data structures by a recursive partitioning process that subdivides the dataset into smaller subsets, with the explicit aim of pinpointing ano-

malies along shorter paths. Given the intricate and diverse nature of the attributes within our dataset, the algorithm emerged as a sensible choice for the task of identifying unexpected patterns or outliers in the context of urban planning parameters and diversity indices.

4. Results

4.1. Cultural Diversity Indices

Religious diversity showed the highest levels in Melbourne's Central Business District (CBD) and surrounding areas, but the overall range of religious diversity is limited to only a 20% difference between the least diverse and most diverse areas, indicating that religious diversity is generally consistent across Australia (see Figure 1).

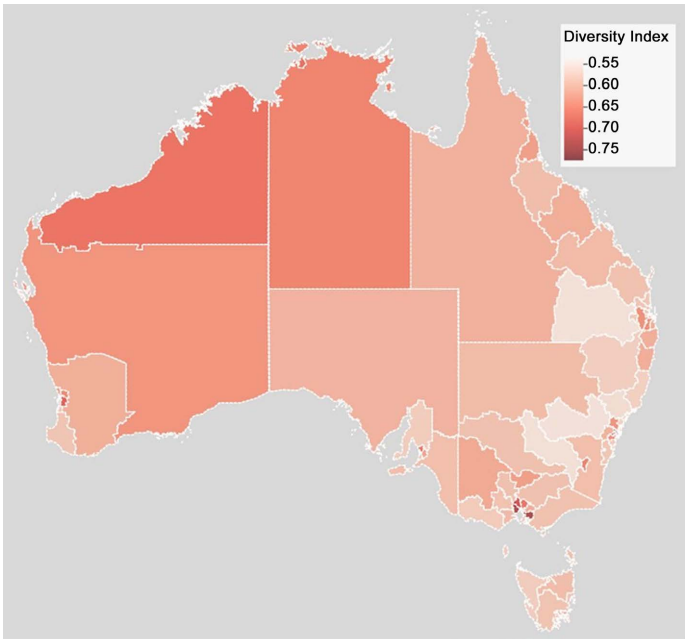

Figure 1. Religion diversity index.

Language diversity is generally higher in urban and lower in regional areas (see Figure 2). However, when looking at Western Australia, Northern Territory and Queensland, all the northernmost points demonstrate greater language diversity than other rural areas of the nation. This could be related to the lower population as well as migrant populations settling there, work opportunities in these area and Indigenous populations.

Country of birth diversity, as with language diversity, demonstrates greater diversity in urban areas, and lower diversity in regional areas (see Figure 3). Interestingly, regional Western Australia does not follow this trend, demonstrating greater country of birth diversity than other regional areas in the nation. This could be due to work opportunities and/or migrant populations settling in Western Australia.

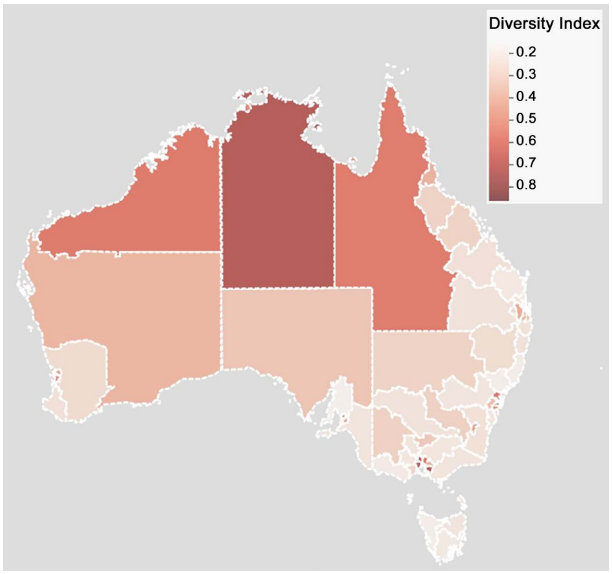

Figure 2. Language diversity index.

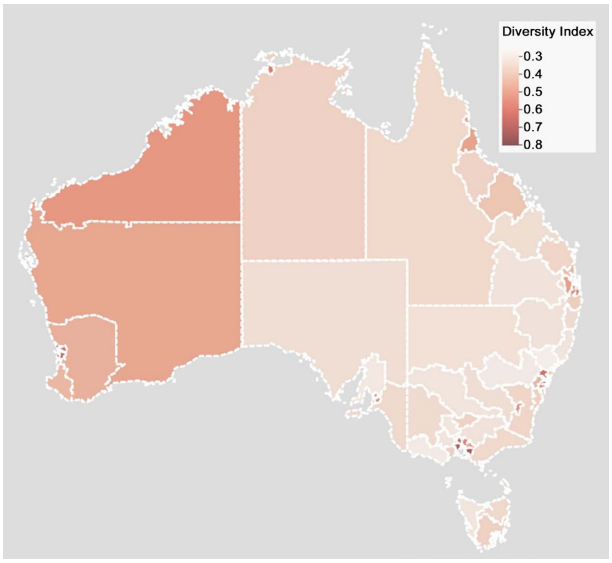

Figure 3. Country of birth diversity index.

4.2. Social Disorganization Index (SDI)

The SDI demonstrated a negative relationship with all diversity parameters (see Figure 4), indicating that areas with high cultural diversity tend to have less social disorganisation in relation to family disruption, education and income disparity. Spearman's correlation indicated SDI had the strongest relationship with country of birth ($\rho = -0.678$, $n = 88$, $p < 0.001$), followed by language ($\rho = -0.618$, $n = 88$, $p < 0.001$) and religion ($\rho = -0.419$, $n = 88$, $p < 0.001$).

4.3. Income Disparity

Income disparity has a negative correlation with all cultural diversity parameters (see Figure 5). This indicates that areas with greater cultural diversity generally

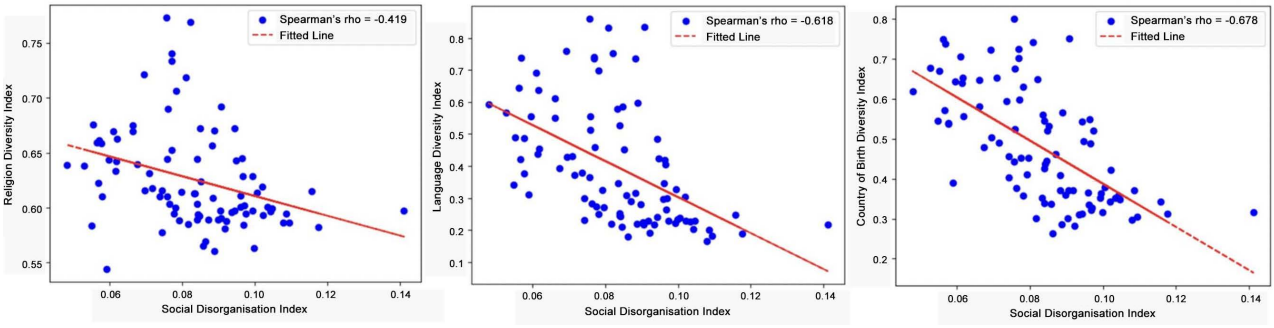

Figure 4. Scatter plot of Spearman's ρ of SDI and cultural diversity indices.

have a lower number of low-income households. Spearman's correlation indicated the Income Disparity Index had the strongest relationship with country of birth ($\rho = -0.71$, n = 88, $p = 0$), followed by language ($\rho = -0.63$, n = 88, $p < 0.001$), and religion ($\rho = -0.43$, n = 88, $p < 0.001$).

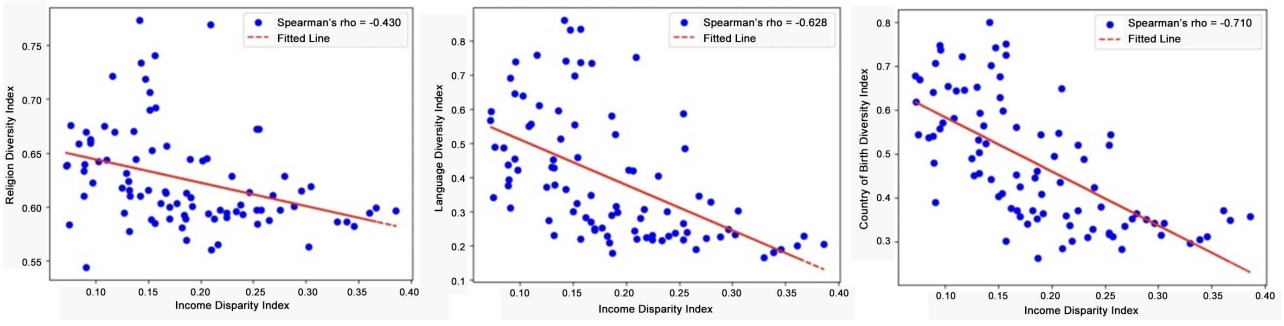

Figure 5. Scatter plot of Spearman's ρ of income disparity and cultural diversity indices.

4.4. Economic Parameters

There is a positive relationship between median weekly income and all cultural diversity parameters (see **Figure 6**). This indicates that areas of greater cultural diversity tend to have higher median weekly incomes and housing prices. Spearman's correlation indicated the weekly median income had the strongest monotonic relationship with country of birth ($\rho = 0.70$, n = 88, $p < 0.001$), followed by language ($\rho = 0.64$, n = 88, $p < 0.001$) and religion ($\rho = 0.48$, n = 88, $p < 0.001$).

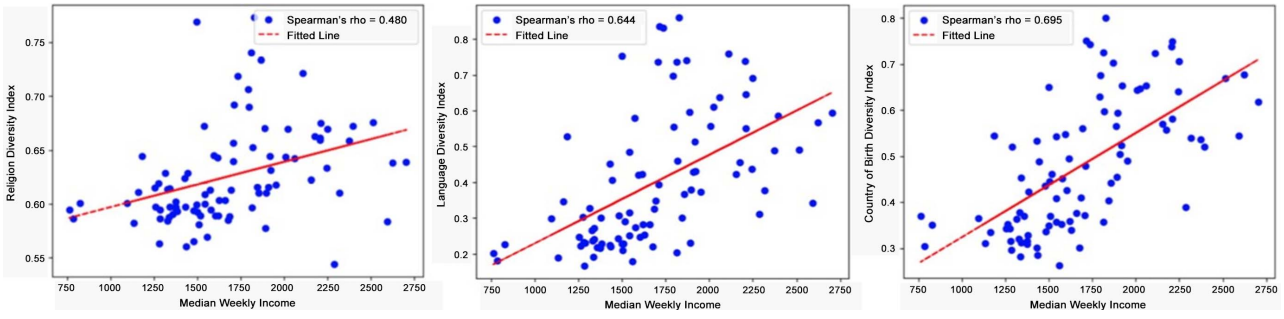

Figure 6. Scatter plot of Spearman's ρ of median weekly income and cultural diversity indices.

Positive trends were observed for housing prices and cultural diversity parameters. Spearman's correlation indicated median weekly mortgage prices had the strongest relationship with country of birth ($\rho = 0.67$, n = 88, $p < 0.001$), followed by language ($\rho = 0.55$, n = 88, $p < 0.001$) and religion ($\rho = 0.38$ n = 88, $p < 0.001$). Similarly, for weekly rent prices, Spearman's correlation indicated the strongest relationship with country of birth ($\rho = 0.61$, n = 88, $p < 0.001$), followed by language ($\rho = 0.47$, n = 88, $p < 0.001$) and religion ($\rho = 0.30$ n = 88, $p = 0.004$).

4.5. Anomaly Detection

Anomaly detection was employed to identify regions that deviated from the general trend. These can be useful places for policymakers and urban planners to investigate.

Spearman's correlations revealed specific attributes had strong connections with diversity indices. These attributes, chosen for their notable correlations, were crucial in succeeding analyses. To streamline the approach and enhance the relevance of research, anomaly detection was concentrated on these key attributes. This focused strategy was harnessed to identify influential anomalies impacting the relationships between urban planning and cultural diversity. Areas and features of interest are summarised in Table 2.

Anomalies were extracted that had significantly different values from trends, given the regions' cultural diversity indices. All anomalies observed were in New South Wales, with one exception observed in the Northern Territory. Given the cultural diversity of the region, "Northern Territory-Outback" and "Sydney-Paramatta" produced the most anomalies of urban parameters. These results will be discussed in more detail in the discussion.

Table 2. Anomaly detection areas, values and medians.

State/Territory	SA4	Religion diversity index	Language diversity index	COB diversity index	Median weekly mortgage	Median weekly income	SDI	Unemployment	Income disparity index
NT	Northern Territory-Outback	0.66	0.74	0.37	433	1706	0.08	0.09	0.17
NSW	Sydney-Paramatta	0.77	0.86	0.80	550	1828	0.08	0.07	0.14
NSW	Sydney-Sutherland	0.54	0.31	0.39	-	2286	0.06	0.03	0.09
NSW	Sydney-Inner South West	0.72	0.83	0.74	-	-	-	0.06	-
NSW	Sydney-South West	0.69	0.83	0.75	-	-	0.09	0.07	-
NSW	Hunter Valley excl. Newcastle	0.57	0.18	0.26	-	-	-	-	0.19
Median		0.61	0.34	0.45	433.25	1621	0.08	0.05	0.17

4.6. Discussion

The results show that metropolitan areas tend to have more culturally diverse

populations, especially in relation to language and country of birth diversity. Religious diversity is greater in Melbourne's CBD and surrounding areas, but there is no general trend across Australia, with areas in rural Western Australia and Northern Territory displaying high levels of religious diversity. There is also a much smaller difference in the minimum and maximum values of religious diversity index values, with a range of ~20%. This range is much larger for language diversity (~60%) and country of birth diversity (~50%).

All urban parameters that yielded a significant relationship with diversity parameters indicated the strongest relationship with country of birth, followed by language and finally religious diversity. This may indicate the dispersion of diversity in Australia, wherein urban areas demonstrate higher levels of country of birth and language diversity, accompanied by corresponding elevated values for urban parameters. For all urban parameters, religious diversity exhibited the weakest relationship. This could be due to the more uniform distribution of religious diversity across the entirety of Australia, making it harder to find a meaningful spatial trend. These findings indicate the presence of mediating variables, such as distance from the CBD.

Visual inspection and anomaly detection revealed that a few SA4 regions in Australia show distinct trends. Notably, "Northern Territory-Outback" and "Sydney-Paramatta" are two regions where, based on cultural diversity indices, all selected urban parameters deviate from the norm. These areas indicated higher values than the median for median weekly income and unemployment. This indicates these populations earn a relatively higher salary than the rest of the country, but exhibit higher rates of unemployment, which could be an area of interest for local governing bodies.

All regions that were detected as anomalous, except "Sydney-Sutherland" and "Hunter Valley excl. Newcastle" had large language diversity values. "Sydney-Sutherland" and "Hunter Valley excl. Newcastle" are interesting anomalies to compare, as they demonstrated below median values for all diversity measures, but different outcomes for income disparity.

The general trend suggests that greater cultural diversity is related to a lower proportion of low-income households, with the converse holding true for low cultural diversity regions, a pattern observed in "Hunter Valley excl. Newcastle" but not in "Sydney-Sutherland". This highlights "Sydney-Sutherland" as an anomaly—a region with lower diversity, but with a lower proportion of low-income households and high median weekly income. In contradicting the broader observed trends, this SA4 region emerges as an interesting region to investigate more closely at a neighbourhood level.

5. Conclusion

This study set out to investigate the relationship between cultural diversity and urban parameters in Australia Statistical Area Level 4 (SA4) regions. Further, the study aimed to investigate any trends and deviants from trends within the data, which could be a point of focus for policymakers and urban planners. From the

overall trend in the data, it is evident cultural diversity is linked to positive social outcomes, such as greater median income, lower income disparity, lower social disorganization and increased housing prices. Although increased housing prices could be seen as negative, they indicate the economic prosperity and wealth of an area, which can be an overall indication of better social outcomes.

An interesting discovery of Social Disorganization Theory was a strong negative relationship between the SDI and country of birth diversity. Although country of birth and ethnicity are not the same, there is a level of overlap we would expect to see in the results between these variables. However, our results showed that higher country of birth diversity was linked to a decreasing SDI, contrary to Social Disorganization Theory's findings. This initial result could be investigated further at a closer level (e.g. SA3 or SA2 level) for confirmation.

Another interesting discovery from this study is the dispersion of the types of diversity across Australia. Where language and country of birth diversity is greatest in cities, and some regional areas, religious diversity is quite consistent across Australia, indicating that religious requirements may be consistent across Australia, which is potentially useful information for policymakers. A finding of particular interest to the study's authors lies in the notable prevalence of religious and, particularly, language diversity in rural areas of Western Australia, Northern Territory and Queensland. This could be due to the smaller datasets for these regions, with smaller populations, but could also indicate the nature of the workforce in these regions. For example, North West Australia is a big mining area, and includes a transient fly-in-fly-out working population. Therefore, there is more likelihood for variety in this population, which explains the greater language and country of birth diversity. Similarly, Northern Territory has a high migrant population and is also a major mining area, which explains the greater amounts of diversity there. Policymakers, employers and businesses would all be well advised to consider the needs of diverse populations.

Through anomaly detection, it is evident New South Wales contained the most SA4 regions that deviated from observed trends. Notably, one of the regions ("Sydney-Sutherland") demonstrated low levels of cultural diversity, but high economic prosperity and low proportions of low-income households. This region could be worthy of further research to determine why this region differs so much from the general trend.

Limitations and Future Research

Given the correlational nature of this study, none of the findings can be definitively established as causality. Further, due to the complex nature of cultural diversity and social-spatial environments, caution is warranted in attributing meaning to the relationships identified in this study. Many potential mediating factors could account for the observed results. For example, areas with highest cultural diversity were generally closer to CBD locations, where one would expect greater affluence to be reflected in higher incomes and housing prices. This is a variable that could not be controlled for in the present study, because the vast area of

some SA4 regions made it challenging to select a consistent and reliable data point to represent the distance from the CBD.

This study was limited by data availability, data collection and time constraints. The data scope was confined to the Australian Bureau of Statistics (ABS), the only source providing consistent data for cultural diversity and urban parameters in a spatial context. This limitation extended to the urban parameters available, as other data sources were not consistent with the SA4 locations. Further, finding consistent state data online proved difficult as state government data availability is discretionary and not open source in all cases. For example, attempts to include crime data in the analysis were hindered because only some states publish crime data online. This highlights the challenges of conducting extensive data analyses using open-source data, especially across multiple governing bodies.

Further, the time constraints of the study limited the investigation to SA4 locations, which hold a lot of information and therefore make it difficult to investigate the relationship between cultural diversity and urban parameters at a micro level. Because of this, valuable information may have been lost, and may have influenced the results. Future research would benefit from investigating the relationship between diversity and urban parameters at a more granular SA2 or SA3 level, for deeper insights into trends in these communities that could be valuable for policymakers and urban planners. This approach would not only increase data size but would also contribute to more robust and nuanced conclusions.

In conclusion, this study is the first of its kind to investigate the relationship between cultural diversity and urban parameters on a national scale in Australia. While preliminary relationships were suggested by the evidence, further investigation with dedicated time and resources is warranted. The present study offers a foundation for future studies to build upon, in further investigation of how urban socio-spatial communities and cultural diversity interact.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Australian Bureau of Statistics (2021). *Search Census Data.* https://www.abs.gov.au/census/find-census-data/search-by-area

Australian Bureau of Statistics (2022). *Cultural Diversity of Australia.*

https://www.abs.gov.au/articles/cultural-diversity-australia

Australian Government (2017). *Australia's Multicultural Statement, Multicultural Australia—United, Strong, Successful.* https://www.homeaffairs.gov.au/mca/Statements/english-multicultural-statement.pdf

Australian Human Rights Commission (2017). *Inquiry into Strengthening Multiculturalism.*

Australian Human Rights Commission (2024). *Face the Facts: Cultural and Racial Diversity.* https://humanrights.gov.au/our-work/education/face-facts-cultural-and-racial-diversity

Chrobot-Mason, D., & Aramovich, N. P. (2013). The Psychological Benefits of Creating an Affirming Climate for Workplace Diversity. *Group & Organization Management, 38,* 659-689. https://doi.org/10.1177/1059601113509835

Churchill, S. A., & Smyth, R. (2020). Ethnic Diversity, Energy Poverty and the Mediating Role of Trust: Evidence from Household Panel Data for Australia. *Energy Economics, 86,* Article ID: 104663. https://doi.org/10.1016/j.eneco.2020.104663

Clure, E. (2022). Australia's 47th Parliament Features New, More Diverse Faces, Marking Turning Point in Political Representation. *ABC News.*

Cox, T. H., Lobel, S. A., & McLeod, P. L. (1991). Effects of Ethnic Group Cultural Differences on Cooperative and Competitive Behavior on a Group Task. *Academy of Management Journal, 34,* 827-847. https://doi.org/10.5465/256391

Crisp, R. J., & Turner, R. N. (2011). Cognitive Adaptation to the Experience of Social and Cultural Diversity. *Psychological Bulletin, 137,* 242-266. https://doi.org/10.1037/a0021840

Cunningham, G. B. (2019). *Diversity and Inclusion in Sport Organizations: A Multilevel Perspective.* Routledge.

de Soysa, I., & Noel, C. (2018). Does Ethnic Diversity Increase Violent Crime? a Global Analysis of Homicide Rates, 1995-2013. *European Journal of Criminology, 17,* 175-198. https://doi.org/10.1177/1477370818775294

Earley, C. P., & Mosakowski, E. (2000). Creating Hybrid Team Cultures: An Empirical Test of Transnational Team Functioning. *Academy of Management Journal, 43,* 26-49. https://doi.org/10.5465/1556384

Elias, A., Mansouri, F., & Sweid, R. (2020). Public Attitudes towards Multiculturalism and Interculturalism in Australia. *Journal of International Migration and Integration, 22,* 1063-1084. https://doi.org/10.1007/s12134-020-00784-z

Fletcher, M., & Guttmann, B. (2013). Income Inequality in Australia. *Economic Round-Up, No. 2,* 35-54.

Ghazaie, M., Rafieian, M., & Dadashpoor, H. (2019). Exploring the Socio-Spatial Patterns of Diversity and Its Influencing Factors at a Metropolitan Scale. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability, 13,* 325-356. https://doi.org/10.1080/17549175.2019.1677263

Godfrey, M., Kim, J., Eluère, M., & Eys, M. (2019). Diversity in Cultural Diversity Research: A Scoping Review. *International Review of Sport and Exercise Psychology, 13,* 128-146. https://doi.org/10.1080/1750984x.2019.1616316

Gomez, L. E., & Bernet, P. (2019). Diversity Improves Performance and Outcomes. *Journal of the National Medical Association, 111,* 383-392. https://doi.org/10.1016/j.jnma.2019.01.006

Horn, M., Scutella, R., & Wilkins, R. (2011). *Social Exclusion Monitor Bulletin.* Brotherhood of St Laurence and Melbourne Institute.

Jehn, K. A., & Mannix, E. A. (2001). The Dynamic Nature of Conflict: A Longitudinal Study of Intragroup Conflict and Group Performance. *Academy of Management Journal, 44,* 238-251. https://doi.org/10.5465/3069453

Moieni, R., & Mousaferiadis, P. (2022). Analysis of Cultural Diversity Concept in Different Countries Using Fractal Analysis. *The International Journal of Organizational Diversity, 22,* 43-62. https://doi.org/10.18848/2328-6261/cgp/v22i01/43-62

Moieni, R., Mousaferiadis, P., & Oscar Sorezano, C. (2017). A Practical Approach to Measuring Cultural Diversity on Australian Organizations and Schools. *International Journal of Social Science and Humanity, 7,* 735-739. https://doi.org/10.18178/ijssh.2017.v7.917

Moieni, R., Mousaferiadis, P., & Pateel, P. (2022). An Analytical Approach to Measure the Cultural Diversity Mutuality between Two Communities. *NeuroQuantology, 20,* 105-120.

Piekut, A., Rees, P., Valentine, G., & Kupiszewski, M. (2012). Multidimensional Diversity in Two European Cities: Thinking beyond Ethnicity. *Environment and Planning A: Economy and Space, 44,* 2988-3009. https://doi.org/10.1068/a4512

Price, A., Cochran, D. M., Raber, G., & Hill, J. (2020). Evaluating Exposure to Coastal Hazards in the Supervised Offender Population Using Social Disorganization Theory. *Southeastern Geographer, 60,* 215-234. https://doi.org/10.1353/sgo.2020.0018

Sampson, R. J. (1987). Urban Black Violence: The Effect of Male Joblessness and Family Disruption. *American Journal of Sociology, 93,* 348-382. https://doi.org/10.1086/228748

Sampson, R. J., & Groves, W. B. (1989). Community Structure and Crime: Testing Social-Disorganization Theory. *American Journal of Sociology, 94,* 774-802. https://doi.org/10.1086/229068

Shaw, C. R., & McKay, H. D. (1943). Juvenile Delinquency and Urban Areas. *Harvard Law Review, 56,* 681. https://doi.org/10.2307/1334446

Simpson, E. H. (1949). Measurement of Diversity. *Nature, 163,* 688-688. https://doi.org/10.1038/163688a0

Snowden, A. J., & Freiburger, T. L. (2015). Alcohol Outlets, Social Disorganization, and Robberies: Accounting for Neighborhood Characteristics and Alcohol Outlet Types. *Social Science Research, 51,* 145-162. https://doi.org/10.1016/j.ssresearch.2015.01.011

Stahl, G. K., & Maznevski, M. L. (2021). Unraveling the Effects of Cultural Diversity in Teams: A Retrospective of Research on Multicultural Work Groups and an Agenda for Future Research. *Journal of International Business Studies, 52,* 4-22. https://doi.org/10.1057/s41267-020-00389-9

Steele, L. G., Bostic, A., Lynch, S. M., & Abdelaaty, L. (2022). Measuring Ethnic Diversity. *Annual Review of Sociology, 48,* 43-63. https://doi.org/10.1146/annurev-soc-030420-015435

Syrett, S., & Sepulveda, L. (2011). Realising the Diversity Dividend: Population Diversity and Urban Economic Development. *Environment and Planning A: Economy and Space, 43,* 487-504. https://doi.org/10.1068/a43185

Trepka, M. J., Dawit, R., Fernandez, S. B., Sheehan, D. M., Degarege, A., Li, T. et al. (2021). Social Disorganization and New HIV Diagnoses, 2013-2017, Florida: Rural-Urban Differences. *The Journal of Rural Health, 38,* 960-969. https://doi.org/10.1111/jrh.12636

UNESCO (2023). *One Diverse World.* https://www.unesco.org/en/articles/one-diverse-world

Vertovec, S., Hiebert, D., Spoonley, P., & Gamlen, A. (2023). Visualizing Superdiversity

and "Seeing" Urban Socio-Economic Complexity. *Urban Geography, 45,* 179-200.

Yong, E. L. (2019). Understanding Cultural Diversity and Economic Prosperity in Europe: A Literature Review and Proposal of a Culture-Economy Framework. *Asian Journal of German and European Studies, 4,* Article No. 5. https://doi.org/10.1186/s40856-019-0043-3