WORKING PAPER

ITLS-WP-26-10A

A Nexus or Not? A First Examination of Cost-of-Living Concern, Neighbourhood Perceptions, Active Travel, and Wellbeing in Cities

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June 2026

ISSN 1832-570X

INSTITUTE of TRANSPORT and LOGISTICS STUDIES

The Australian Key Centre in
Transport and Logistics Management

The University of Sydney

Established under the Australian Research Council's Key Centre Program.

NUMBER: Working Paper ITLS-WP-26-10A

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ABSTRACT: This paper is a first step in the literature, looking at potential links between cost-of-living stress and the perceptions of local neighbourhoods, under the hypothesis that greater pressure about housing affordability, transportation costs, or indeed cost-of-living overall could lead to a degradation in how the neighbourhood within which a person lives is perceived. We find confirmation that cost-of-living goes beyond technical measures of housing stress and indeed beyond just housing stress alone. Of relevance is that those who could be classified as having rising concern (consumables) have among the highest levels of relative stress. We find that there is generally just as much concern about the rising cost of fuel, which is directly related to trip making, further compounding transport accessibility and equity. Overall, our first attempt to investigate the potential nexus of cost-of-living, neighbourhood perception, wellbeing, physical activity and active travel, produces enough evidence and insight to establish that there are potential links which are likely to play out in unknown ways during cost-of-living crises. We argue that our results are sufficient enough that research should extend them to transportation costs and trip making more generally and urge other researchers to consider building on these insights.

KEY WORDS: ***Cost of living, housing stress, inflation, interest rates, travel behaviour, trip making***

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ACKNOWLEDGEMENTS: The authors would like to acknowledge the contribution of Ashikur Rahman, PhD student at the Institute of Transport and Logistics Studies, for generating the visuals presented in Figure 9.

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DATE: June 2026

1. Introduction

1.1. Rapidly Rising Costs-of-Living

Since COVID19, many national economies have experienced higher than desired rates of inflation, fuelled in part by stimulus measures designed to ward off potential recession pressures injecting extra cash into the economy, but in the main by supply related issues and companies using the disruption to create higher margins (Brooks et al. 2024). In Australia, profit seeking, rather than the conventional wisdom of wage rises, contributed significantly to the rapid rise in inflation between 2019 and 2022 (Stanford 2023). The consequence of the inflation spike shown in Figure 1 (ABS 2024), has been a rise in interest rates as central banks attempt to bring the economy back under control. The cash rate for the Reserve Bank of Australia (RBA) is also shown.

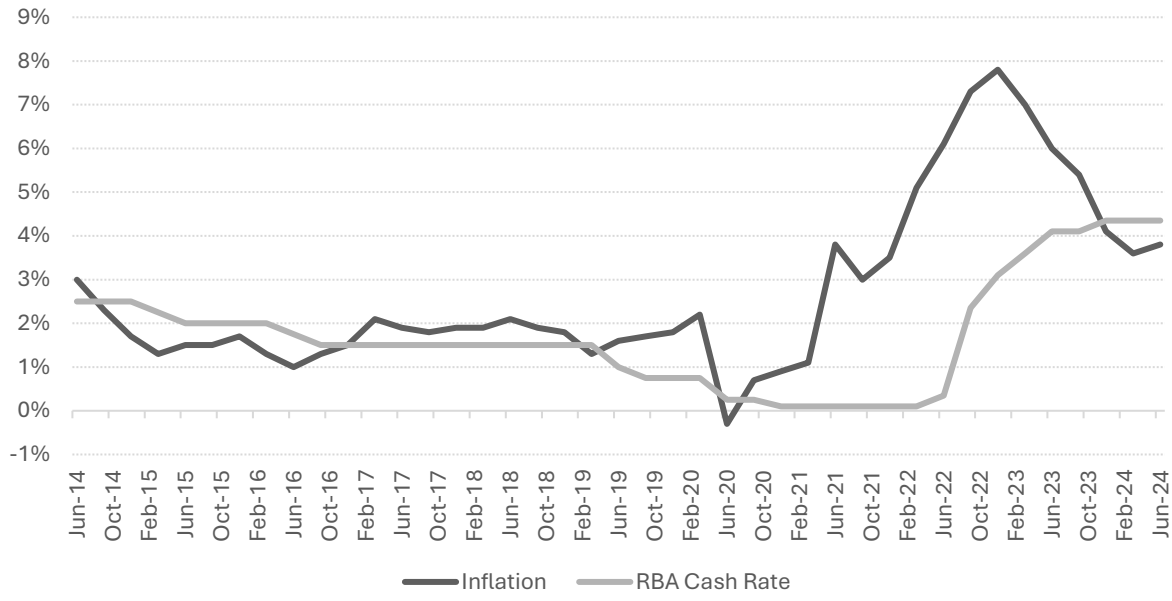

FIGURE 1: Inflation and Reserve Bank of Australia (RBA) Cash Rate

Prior to these twin pressures, housing affordability in Greater Sydney was already an issue. For example, rental housing prices surged after the global financial crisis leading to a 2012 Affordable Housing Taskforce commissioned by the New South Wales Government to declare “by a range of indicators, there is a housing affordability issue facing NSW and this is particularly acute in Sydney and other large regional centres.” (cited in Haylen 2015). However, recent research indicates that this problem has continued to intensify, such that the city’s median property price is now 13.3 times the median income; that 35.3% of renters are in housing stress (paying more than 30% of their monthly income on housing costs); and that such pressure is costing the economy

more than $10bn a year, with women disproportionately impacted do to a “spatial leash”, meaning they often have to work closer to home (CfS 2023). Housing (un)affordability is now at a point that there is nowhere in Greater Sydney that any person on a median part-time or full-time income can afford to buy a home; something that is not expected to change until the 2030’s (Bangura and Lee 2024). Rising interest rates have had very little impact on arresting the rise in housing prices (Chong 2023).

Overall, the real buying power of workers has reduced significantly, with average wages growing at a rate less than half that of price increases. Disposable income in many households is being redirected from consumer expenditure towards higher mortgage repayments or weekly rents. However, it has been found that housing stress affects a broader range of households than that indicated by typical financial measures, with many households being “unrevealed casualties” during such crises (Waldron and Redmond 2016). With respect to the current cost-of-living crisis, many have felt that it is having negative impact on their mental and emotional health and wellbeing (Williams and Dienes 2023), and it has been emphasised that supporting vulnerable households from the potential harms of the cost-of-living crisis will have the greatest health benefits (Broadbent et al. 2023).

1.2. Relating the Literature to Transportation

Housing has long been of interest to built environment, urban studies and transportation scholars, with residential choices significantly impacting transportation and vice-versa (e.g., Borgers and Timmermans 1993, Srinivasan and Ferreira 2002, Bhat and Guo 2007, Wu and Zhao 2014, Tao 2023). Equally, within the field of transportation there has been rising interest in the interplay with psychological well-being. For example, those who make fewer trips are more at risk of social exclusion and those who are socially excluded have significantly lower states of wellbeing (Stanley et al. 2011). Perceived satisfaction with one’s neighbourhood has multiple links to subjective wellbeing and is an indicator of urban liveability (Mouratidis 2020). Relevant in the context of the cost-of-living crisis more broadly, where households are facing increasing financial challenges, being in transport poverty has been found to lower subjective wellbeing (Awaworyi-Churchill and Smyth 2019).

While much of the focus is on housing affordability, transportation and/or accessibility costs are an overlooked measure in location affordability. The general recommendation is that policies to improve housing affordability should be made in coordination with transportation investment, particularly to ensure more equitable outcomes (Saberi et al. 2017). By manipulating housing and transportation costs, cities can promote change in the spatial composition of cities and increase affordability (Marwal and Silva 2023). Housing affordability is significantly linked to mental health of those living in cities (Baker et al. 2020). With a seeming rise in the number experiencing housing unaffordability,

those in the rental sector and younger adults are disproportionately affected by poorer mental health scores (Arundel et al. 2024).

More broadly, for those living in urban environments, there are a range of factors that can influence mental health, both negatively (e.g., social deprivation, air pollution, severance, safety) and positively (e.g., green spaces, destination accessibility) (Xu et al. 2023). There is good evidence that improved active transport infrastructure has the potential to improve health outcomes for city residents and can significantly improve social capital (Crane et al. 2017).

How people perceive their neighbourhood is as important as objective measures, with studies showing that high levels of perceived neighbourhood amenity are positively correlated with increased levels of active transport, such as walking and cycling (Dyck et al. 2012, Pelclová et al. 2013, Kerr et al. 2016). This is important, as walking or cycling not only enhances physical health but also contributes to mental wellbeing by reducing stress and promoting social interactions (Mertens et al. 2016, Shepherd et al. 2020). Overall, there is evidence to suggest that it can help achieve daily physical activity recommendations (Prince et al. 2022).

1.3. Research Contribution

It is reasonable to assume that, in conditions where there is heightened concern about housing costs and costs-of-living in general, households will seek to reduce expenditure, and in turn travel less. This in turn could make households more prone to social exclusion and thus negative wellbeing outcomes (Stanley et al. 2011). To our knowledge, there is scant research in the literature that give any indication as to whether those who are highly concerned are living in locations with poor amenity which could exacerbate such stress, or rather are living in neighbourhoods with good amenity which may somewhat ameliorate cost-of-living concerns, and the negative wellbeing impacts therein.

It stands to reason that there may be a string of interrelated behaviours: that housing and cost-of-living stresses could reduce travel as households seek to reduce expenditure, that stress about one's living situation may translate to worse perceptions of the neighbourhood in which you live and/or be more impacted more acutely by issues that previously went unnoticed. It is not unreasonable to hypothesize that these concerns ultimately translate to poorer wellbeing outcomes: such negative impacts are often hidden by the focus on housing stress (Waldron and Redmond 2016) and others have stressed the need to go beyond technical, bank-defined measures of mortgage payment difficulty when looking at impacts that might exist (O'Neill et al. 2010).

Thus, this paper contributes to the scarce literature about potential issues interrelated with housing and cost-of-living concerns. Specifically, it represents a first attempt in the literature to investigate relative changes in concerns associated with cost-of-living, identify different segments of such concern which are related to different sources of

pressure. Further we explore if cost-of-living pressures are systematically related to both perceived and objective measure of neighbourhood amenity, quality of life outcomes, and general health indicators. As such, this paper becomes the first in the literature to investigate the cost of living, built environment and active transport, wellbeing and physical activity nexus.

The rest of the paper is structured as follows: in the next section we outline the data collection process and the characteristics of the survey sample, and in Section 3 we overview the empirical methods used in the paper. In Section 4 we provide the results of that analysis; we quantify current levels of cost-of-living concern, identify the different segments of concern that exist in the data; characterise how they differ; and relate them to perceptions of neighbourhood characteristics, physical activity, and subjective wellbeing. In Section 5 we discuss the implications of this analysis, followed by an acknowledgment of the limitations of the study and an identification of potential future research. We conclude the paper in Section 7.

2. Data Collection and Sample

The data used in this study came from a survey which was conducted in November 2023 as part of a longer series of cross-sectional surveys that were originally designed to examine travel and health in the Greater Sydney region. Given the nature of the original survey, a series of robust measures were developed to provide data on demographics, active travel undertaken, local neighbourhood perceptions, and the overall health and wellbeing of the respondent (Rissel et al. 2013).

In the most recent November 2023 survey, we included questions relating to perceived cost of living pressures: an ongoing topic of great interest even in 2024. The questions focused on each of the main sources of pressure commonly discussed in the popular media: housing costs; gas/electricity prices; fuel prices; food and essential prices. Additionally, we added a fifth question around concern toward the environment and climate change, motivated by the fact that Greater Sydney has experienced significantly disrupted weather patterns, ranging from the Black Summer fires in 2019/2020 to the ongoing floods of 2022/2023.

The survey was conducted online, taking 10 and 15 minutes to complete, using a panel recruitment company who provided a nominal incentive. The budget allowed for a recruitment target of approximately 1,500 participants, with the aim to match the sample to the age and gender characteristics as per the most recent Australian (2021) census figures. The survey further had spatial quotas to ensure adequate representation across inner, middle and outer city areas. As shown in Table 1, following data cleaning on the relevant questions required for the analysis herein, the final sample data from 1,182

respondents can be assumed to be a broad match to the census with respect to gender, age and income (ABS 2022).

TABLE 1: Sample Demographics

		Sample	***Census (2021)***
Gender	Male	49%	*49%*
	Female	51%	*51%*
Age Category (yrs)	18-24	10%	*11%*
	25-34	19%	*20%*
	35-44	18%	*19%*
	45-55	17%	*16%*
	56-64	16%	*14%*
	65-74	11%	*11%*
	75+	8%	*9%*
Income	Median	$108,286	*$110,000*

Given that we were interested in how cost-of-living concerns may vary, the research team also felt that residential ownership status would likely be an important factor (Figure 1). According to the 2021 census for Greater Sydney, 26.7% of people owned their home outright (compared to 28% in our sample), 31.9% owned their home with a mortgage (compared to 24% in our sample), and 34.7% rented (compared to 41% in our sample). Given that we intentionally over-sampled from the inner regions of Sydney where there are higher rates of renting, we believe there is good reason to believe that our sample is broadly representative across this dimension as well.

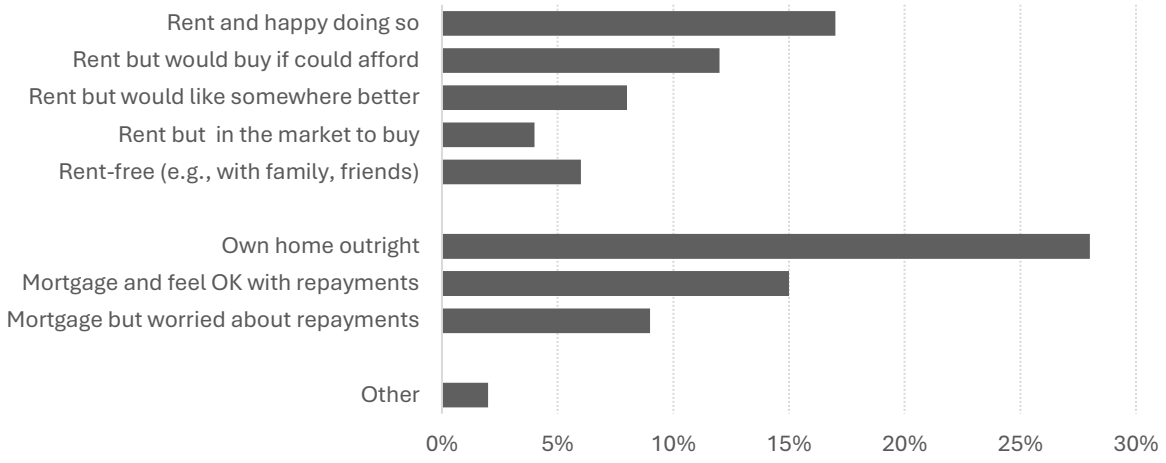

FIGURE 1: Home Ownership/Rental Status

3. Overview of Methodology

Cost of living perceptions were assessed via a 5-point scale, where respondents rated their level of concern relative to the same point of time 12 months prior. The questions asked for concern across four popularly discussed dimensions: housing affordability (costs of rents and/or mortgages), gas and electricity prices, fuel prices, and the price of food and essentials. In parallel a question was asked about how much concern was felt towards the environment and climate change to contrast environmental concerns relative to day-to-day pressures associated with costs-of-living. Factor analysis is deployed within the paper, a commonly used method in the social sciences to reduce highly related data (typically attitudinal scale items) down to the underlying latent constructs that may be driving the observed scale responses, a method that is appropriate with trying to identify the smallest number of such constructs that can parsimoniously explain the covariation among the set of measurement variables (Watkins 2018). Such analysis is done on neighbourhood perceptions (to reduce responses on a comprehensive set of statements down to the key underlying dimensions). It is also separately conducted on the five cost-of-living stress indicators, to confirm that while there are subtle differences across the measures, there is one underlying construct of "total cost-of-living stress" that is common across all five measurement items.

These measures were analysed independently using conventional statistical inferencing to understand which of the commonly cited sources of pressure were most concerning among the sample and were also inputs into a series of *k*-means clustering models. This is an unsupervised machine learning technique used for partitioning a dataset into a pre-defined number of clusters. For the specified number of clusters, the algorithm deployed seeks to locate data points that share common characteristics, and subsequently assign them to one of the given clusters. The clustering process generates an average (or cluster centre) for each cluster and seeks to minimise the Euclidean distance between each observation and the cluster centres that are identified, while trying to maximise the distance between the cluster centroids themselves.

The benefit of this technique is that it ultimately places observations (in this instance respondents perceived cost-of-living stress) into clusters that are homogeneous in nature within membership, but heterogeneous across the clusters themselves. To determine the final number of clusters an iterative approach must be used, where a different potential number of clusters are specified, and the analyst carefully evaluates descriptive measures of cluster appropriateness (such as maximising the silhouette coefficient) in conjunction with the applicability and sensibleness of the estimated clusters. Once the optimal solution was identified, the clusters were then further examined using the existing robust measures of transport, health and neighbourhood

amenity to determine what, if any, other characteristics might help define those in the sample experiencing different levels of stress.

4. Results

4.1. Concern Now vs Concern Twelve Months Prior

Figure 2 shows the distribution of relative changes in concern across each of the five levels of concern. The majority of respondents report a little or a lot more concern than they felt 12 months prior for all scale items; a test of each scale item against the midpoint of no change (value of 3) reveals the greater average levels of concern to be *highly* significant[1].

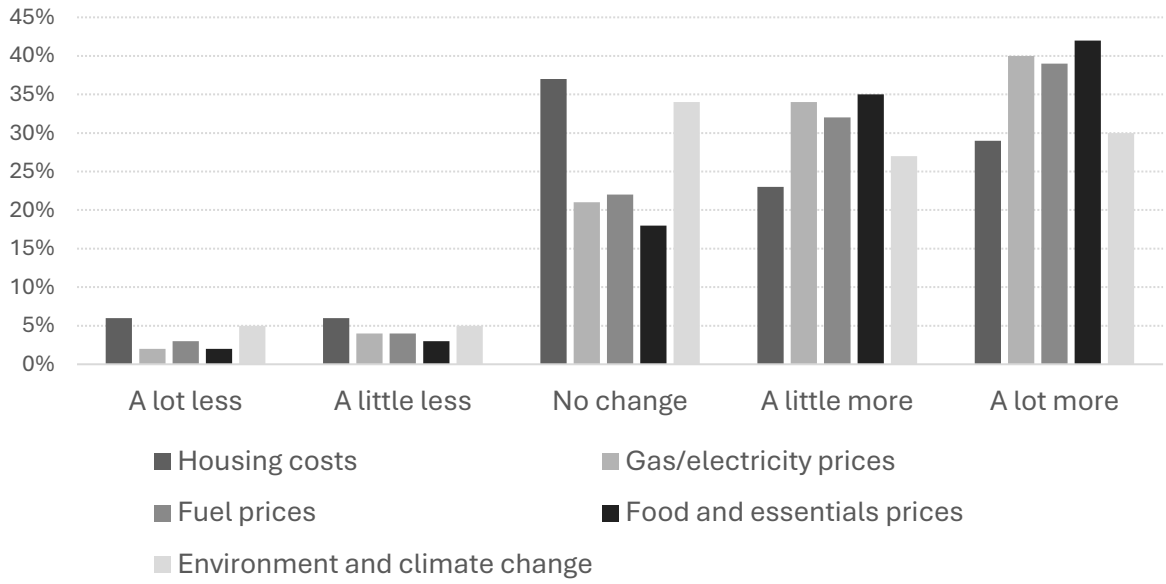

FIGURE 2: Change in Concern Relative to 12 Months Ago (Nov. 2023 vs Nov. 2022)

Interestingly, testing of the average scores against each other revealed that concern about the pricing of food and essentials, fuel prices and gas/electricity prices to be roughly equal, but significantly higher than concern about housing costs and the environment[2]. Acknowledging that these are relative changes to levels of concern, rather than the absolute measures, this result highlights that while housing costs capture the majority of wider media discussion, the reality of cost-of-living pressures are often

[1] Housing costs (μ = 3.6, t = 19.704), Gas/electricity prices (μ = 4.1, t = 41.762), Fuel prices (μ = 4.0, t = 37.507), Food and essentials prices (μ = 4.1, t = 46.806), Environment and climate change (μ = 3.7, t = 25.455)

[2] F = 23.957, sig. = 0.000

perhaps more nuanced – an important finding highlighted within the literature review. Levels of concern are all significantly positively correlated with each other, indicating that concern on one dimension also likely equates to higher concern on all other dimensions, the correlations are particularly strong between energy prices, fuel prices, and the cost of food and essentials[3].

With respect to differences across demographic characteristics, males and females express the same level of concern with respect to housing costs, but females report significantly higher average scores for the remaining sources of concern[4]. Those with children at home (<=18 years) report significantly higher levels of concern with respect to housing costs and the environment[5]. There are significantly negative, albeit weak, correlations between income which indicates those on higher incomes tend to report lower concerns with respect to the cost-of-living. Weakly significant correlations also reveal that younger people are more likely to be concerned about housing costs and the environment, whereas older respondents are more concerned about energy prices and fuel prices. Lastly, with regards to home ownership/rental status, those most concerned with housing costs are renters in general, but particularly those who would buy if they could afford it, followed by mortgage holders who are worried about their repayments. These worried mortgage holders are the most concerned about energy prices, fuel prices and the costs of food and essentials, with those who currently rent but would buy if they could afford it also reporting high concern across these dimensions. There is no variation in environmental concern across over this variable.

4.2. Clusters of Relative Concerns

As discussed in the methods section, the relative changes in concern scale items were used in a *k*-means cluster analysis to determine if different clusters of concern could be identified in the sample. An iterative process trialling different *k* cluster solutions identified that five clusters of concern existed, with respondents within a cluster having expressed homogenous patterns of concern, but significantly different patterns across the estimated clusters. Figure 3 shows the average responses to each of the five scale items for each of the five clusters, and Figure 3b provides the size of each cluster. Overall, just less than one-third of respondents report lower levels of relative concern (4%) or the same level of concern (27%) relative to 12 months ago, however close to seven out of ten report higher concern than the same time last year.

At the centre of the radar-plot is a small group of respondents who, on average, report that they have a lot less concern than they did a year ago; this group is labelled *diminishing concerns*. There is a group who generally report no change in their level of

[3] All correlation coefficients are between 0.628 and 0.660.
[4] Housing costs (t = 1.81), Gas/electricity prices (t = 3.028), Fuel prices (t = 3.245), Food and essentials prices (t = 4.421), Environment and climate change (t = 2.403)
[5] Housing costs (t = 4.065), Environment and climate change (t = 4.778)

concern on each scale item indicating that concerns are *holding constant*. There is a cluster who generally report a little more concern across four of the five items, but quite high levels of concern with respect to housing, this cluster is labelled *rising concern (housing)*. The fourth cluster is one that also reports rising concern but particularly so for energy, fuel and food prices, thus this cluster is labelled *rising concern (consumables)*. The last cluster identified generally report a lot more concern than last year across the board, so this group is termed *highly concerned*.

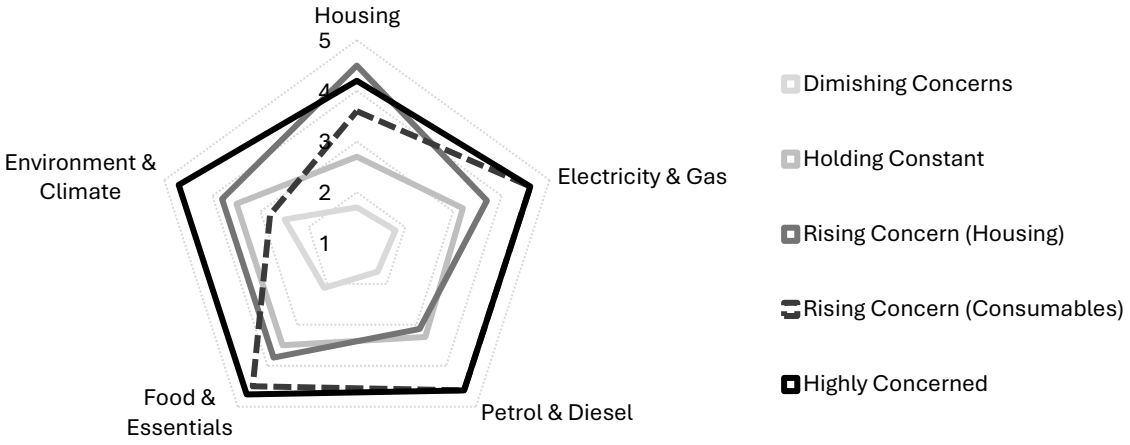

FIGURE 3: Cluster Average Score for Each Type of Concern

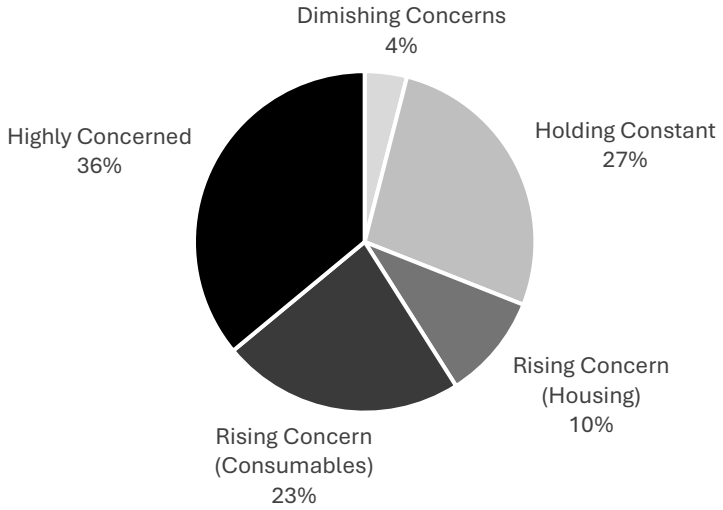

FIGURE 4: Size of Each Cluster of Concern

4.3. Understanding Cluster Composition

4.3.1. Demographics

Having identified these five clusters in the responses and assigned each respondent to one of them, we can also start to examine if there are other characteristics over which the clusters might differ. Unsurprisingly, demographic differences between the clusters generally follow the same patterns identified with respect to each of the underlying elements of concern, but there are subtle differences in composition. Females are more likely to belong to the *highly concerned* cluster, whereas males are slightly more likely to belong to *diminishing concern* and *holding constant*. Those with children are significantly, though slightly, more likely to belong to the *highly concerned* cluster, whereas those without are slightly more likely to belong to *holding constant*. Those belonging to the *rising concern (consumables)* and *holding constant* clusters are on average older. Those belonging to the *holding constant* and *diminishing concern* clusters have higher average incomes.

4.3.2. Perceived Neighbourhood Amenity

The survey included a validated instrument using thirteen scale items to assess perceptions of the local environment; particularly those associated with active travel (Ogilvie et al. 2008). To help make analysis more parsimonious, exploratory factor analysis (using principal components with varimax rotation) was conducted on these items, ultimately reducing the 13 statements into three underlying constructs. The Barlett's test reveals significant correlations among the scale items (χ^2 = 5015.289, sig. = 0.000) and the Kaiser-Mayer-Olkin value (0.801) indicated that factor analysis on this data was highly appropriate.

Table 2 reports the factor loadings for each statement, a higher factor loading for a statement indicates higher association with that underlying construct. Statements are ordered by the factor score for the factor on which that statement loads most strongly: and the factors can be named based on the commonality between the statements loading onto that factor. The six bolded factor loadings in the first column are mostly related to the perceived *walkability* of the neighbourhood, the four bolded loadings in the second column seem to relate to the perceived *amenity* of the neighbourhood, and the remaining loadings in the third column indicate that the third factor relates to perceptions of *more traffic*.

A factor score for each of these three factors can be estimated for each respondent, which in turn can be analysed. In this instance we examine difference in perceptions across the clusters of concern previously identified. The average factor scores for each cluster on each of the factors are displayed in Figure 5. It should be noted that factor loadings are not directly comparable across factors, and within a factor they are relative measures based on a zero-centred mean score across all observations: positive scores indicate a higher relative score on that construct, negative scores represent lower relative

scores on the measured construct. Interestingly only one clear pattern emerges from this analysis, those in the *diminishing concern* cluster tend to live in areas perceived to be relatively more walkable, pleasant and less traffic impacts. Overall, this suggests that perceptions of the built environment are not correlated with cost-of-living concerns, outside of this fortunate *diminishing concern* group.

TABLE 2: Perceptions of Neighbourhood Characteristics

	Walkability	Amenity	More Traffic
There are convenient walking routes	**0.768**	-0.081	-0.058
It is safe to cross the road	**0.745**	0.064	-0.190
It is pleasant to walk	**0.690**	-0.193	-0.017
It is safe to walk after dark	**0.645**	0.194	-0.100
There is a park within walking distance	**0.633**	-0.281	0.136
There is convenient public transport	**0.533**	-0.174	0.345
The nearest shops are too far to walk to	-0.031	**0.771**	0.035
There are too many hills	-0.038	**0.733**	0.189
The surroundings are unattractive	-0.180	**0.706**	0.344
There is little green space	-0.065	**0.668**	0.220
There is a lot of traffic noise	-0.046	0.212	**0.793**
There is a lot of traffic	0.009	0.169	**0.771**
The roads are dangerous for cyclists	-0.050	0.242	**0.674**

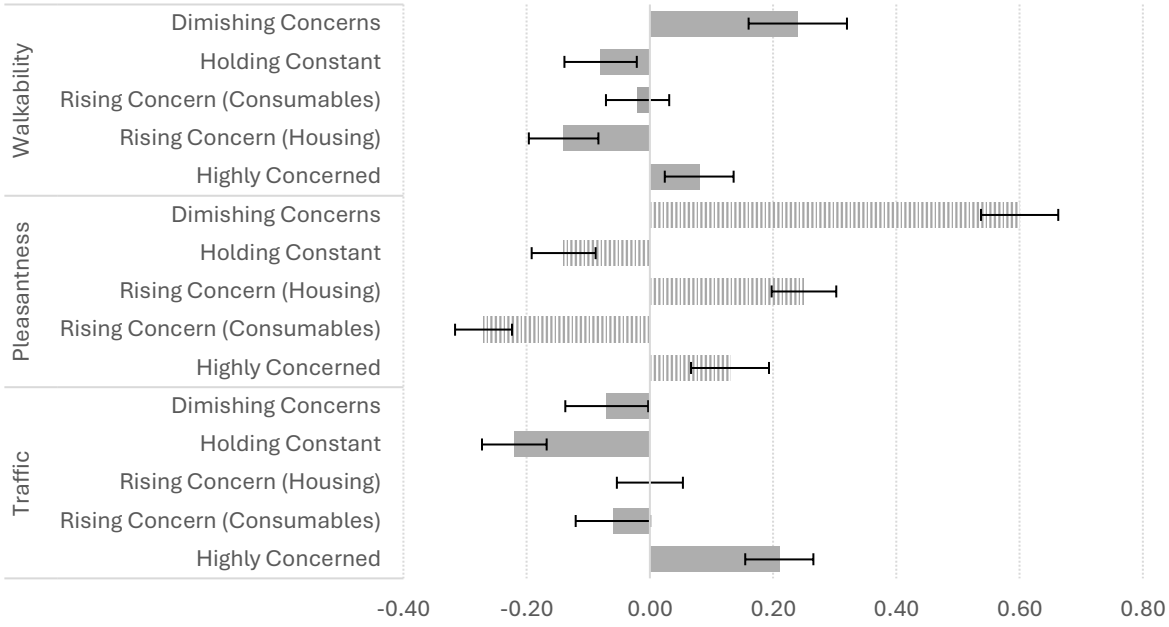

FIGURE 5: Factor Scores by Cluster Membership (*whiskers = 95% C.I.*)

4.3.3. Objective Measures of Neighbourhood and Stress

To complement the subjective evaluation of neighbourhood amenity, and the perceived changes in relative stress, more objective measures of such indicators were used, sourced from data collated by the Australian Urban Observatory (www.auo.org.au). This is an open-source digital platform that collates data using developed and tested liveability indicators across 21 Australian cities (Davern et al. 2023). Most relevant to this study are the overall walkability (https://auo.org.au/portal/metadata/walkability) and housing stress (https://auo.org.au/portal/metadata/housing)[6] indicators as they most closely match our questions of perceived amenity and relative changes in concern. It should be noted that these indicators are an aggregate value at a local government area (LGA) of which there are 35 in Greater Sydney, and within an LGA there exists a wide variety of walkability and financial positions that are lost in such aggregation.

With respect to these two objective AUO measures, there is a significant and mild positive correlation between them[7], indicating that those living in areas of better walkability are also in areas where there are more households experiencing housing stress. Of note is that our measures of perceived neighbourhood amenity as per three dimensions revealed by the factor analysis are significantly correlated with the AUO's objective measure, albeit weakly, indicating a small relationship between how respondents perceive their environment and how others may measure it[8]. With respect to differences by cluster[9], those in the *holding constant* cluster live in areas with lower walkability scores on average[10], but also in areas with lower average proportions of residents experiencing housing stress. As to be expected, those in the *highly concerned* and *rising concern (housing)* clusters live in areas that have the highest average proportions of households experiencing housing stress, but also the highest average levels of walkability.

4.3.4. Quality of Life and Physical Activity

A 26-item self-rating of quality of life (QoL) and health satisfaction developed by the Work Health Organisation (WHOQoL-BREF) was also a component of the survey, which are aggregated such that they measure physical, psychological, social and environmental health (Murphy et al., 2000). Figure 6 displays the scores on each of these four QoL dimensions (where a higher score indicates a better outcome). Much like perceptions of neighbourhood amenity there are no notable patterns that emerge, other than those in the *diminishing concerns* cluster reporting consistently (and more often than not

[6] Specifically the 30:40 indicator where a dwelling is defined as experiencing housing stress if it is in the the bottom 40 percent of household income and spending more than 30 percent of that income on housing costs (https://www.ahuri.edu.au/analysis/brief/understanding-3040-indicator-housing-affordability-stress).

[7] r = 0.574, sig. = 0.000

[8] r is between 0.10 and 0.15, and all sig. = 0.000

[9] Average walkability by cluster (F = 7.267, sig = 0.000); housing stress by cluster (F = 5.589, sig. = 0.000)

[10] Average walkability by cluster (F = 7.267, sig = 0.000); housing stress by cluster (F = 5.589, sig. = 0.000)

significantly) higher QoL outcomes. Of note is that the *highly concerned* cluster reports QoL outcomes that are no different to the other clusters.

Physical activity (PA) was measured using the validated Active Australia Survey scale, where participants recorded frequency and duration of walking, moderate and vigorous PA lasting 10 minutes or more in the last seven days (AIHA 2003). A sufficient amount of PA health is defined to be at least 150 minutes of PA (vigorous activity counts double) across at least five sessions per week. Table 3 reports the proportion of respondents within each cluster that are achieving a sufficient level of PA, where a significant relationship between PA and cluster membership exists[11]. Those respondents in the with *diminishing concerns* are more likely to attain a sufficient quantum of PA, whereas those in the rising concern (consumables) cluster are significantly less likely to reach this threshold.

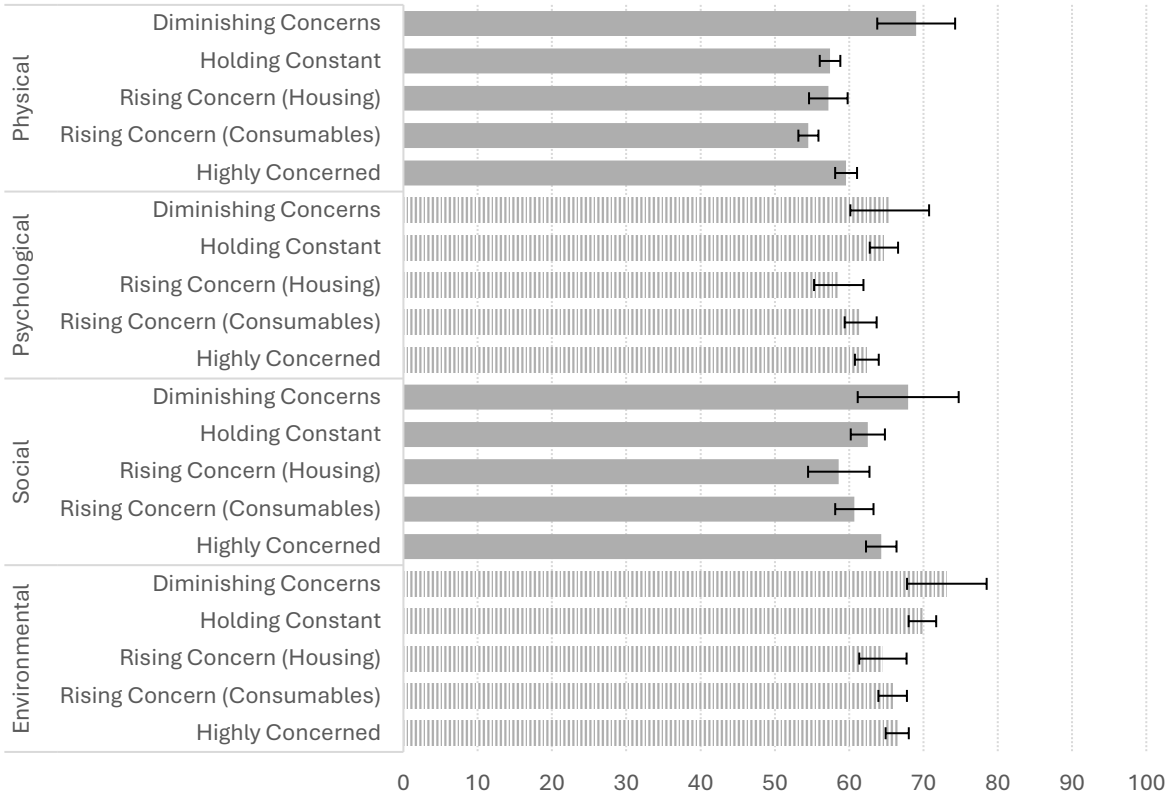

FIGURE 6: Quality of Life Indicator Scores by Cluster Membership (whiskers = 95% C.I.)

[11] $\chi^2 = 35.699$, sig. = 0.000

TABLE 3: Sufficient Physical Activity (PA) by Cluster of Concern

	No PA (0 mins)	**Some PA** (< 150mins *or* ≥ 150mins but< 5 sessions)	**Sufficient PA** (≥ 150mins & ≥ 5 sessions)
Diminishing Concerns	2%	10%	89%
Holding Constant	4%	23%	72%
Rising Concern (Housing)	2%	20%	78%
Rising Concern (Consumables)	6%	30%	64%
Highly Concerned	3%	15%	82%

Highly sedentary behaviour is generally considered to be a threshold of sitting or being inactive for eight or more hours per day (Benne et al. 2016). Figure 7 displays the proportion of respondents within each cluster that are classified as such. The least sedentary are those in the *diminishing concerns* cluster (with an overall average of 5.5 hours sitting), those in the *rising concern (consumables)* are significantly more likely to be classified as highly sedentary, with half meeting this threshold (and have average sitting time per day within across the cluster itself being 8.5 hours). Those that are highly concerned report "middling" results (averaging 6.7 hours sitting per day).

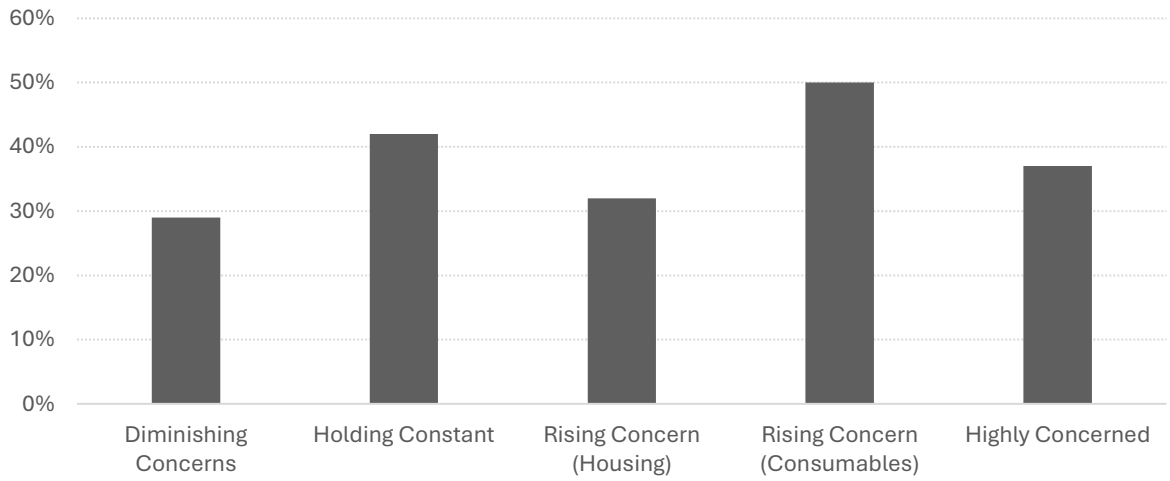

FIGURE 7: Proportion of Cluster Classified as Highly Sedentary (Sitting for more than 8 hours/day)

4.4. Variations in Aggregate Levels of Concern

4.4.1. A Measure of Total Cost-of-Living Stress

The final piece of analysis for this paper is to look at what might be determinants of overall changes in cost-of-living stress. Factor analysis was again deployed as the first stage on

the responses to the five areas of concern (housing affordability (costs of rents and/or mortgages), gas and electricity prices, fuel prices, the price of food and essentials, and concern about the environment and climate change). This process revealed that these five statements could be reduced to one underlying *Total CoL Stress* dimension[12]. The factor score for *Total CoL Stress* thus represents a measure of a respondent's overall degree of stress, relative to a zero-centred average; meaning that positive scores indicated a change increase in stress that is higher than the sample average (i.e. are more stressed than average), whereas negative scores represent a change in stress that is less than the sample average (i.e. are less stressed than average).

While there are benefits to reducing the five cost-of-living statements into one underlying dimension of concern, doing so does eliminate the nuanced variation in such concern that has been highlighted and discussed in the previous sections.

Figure 8 shows the average *Total CoL Stress* factor score for each of the five clusters, where the five average scores on this measure are significantly different from each other, further confirming that five clusters of concern used in this analysis is indeed the optimal number[13]. As expected, those in the *diminishing concerns* cluster have significantly lower *Total CoL Stress* than all other clusters, and those in the *highly concerned* cluster have significantly the most. Interestingly, the rising concern (consumables) average is significantly higher than the rising concern (housing), providing some indication that concern about consumables increases *Total CoL Stress* significantly more than concern that more related to housing.

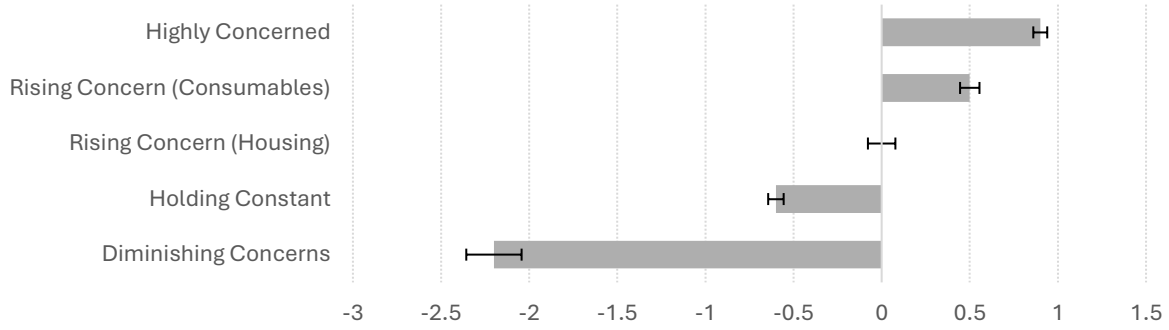

FIGURE 8: Total CoL Stress Factor Score by Cluster Membership

4.4.2. Factors Associated with Total Cost-of-Living Stress

Since the factors generated by the factor analysis process are continuous in nature (the computed factor scores are standardized to a mean of zero, with a standard deviation of

[12] Barlett's test ($\chi 2 = 2590.919$, sig. = 0.000) and Kaiser-Mayer-Olkin value (0.810)
[13] $F = 1029.361$, sig. = 0.000

one in this instance, since the principal components method was used), the *Total CoL Stress* measure can be used as the dependent variable of a linear regression, to gain insight into what variables are significantly related to the observed variation in *Total CoL Stress* across all respondents pooled together.

The variables discussed in the paper were initially regressed against *Total CoL Stress* (plus one additional question that was asked about being able to separate work and personal life), and after checking for potential issues such as multiple correlations, nonlinearity, and interactions, the initial model was refined via a stepwise process. Table 4 presents the results of the final regression model, where only the significant variables are included.

Looking across the sample, those respondents who perceive themselves to be sitting relatively more compared to 12 months ago have significantly higher *Total CoL Stress*, (and reported hours spent sitting per day also is related with increased *Total CoL Stress*). Those finding it more difficult to separate work and personal life have higher *Total CoL Stress*, as do those who have a mortgage and are worried about repayments, and those renting but who would prefer to buy if they could afford to do to. Females exhibit significantly more *Total CoL Stress* as do older respondents, but the negative age and income interaction affect shows that the amount of stress is moderated by high income (income itself has no direct effect). Those who perceive there to be greater levels of traffic in their local neighbourhood also report higher *Total CoL Stress*, and those who report a better outcome on the physical quality of life dimension have lower levels.

TABLE 4: Variables Associated with Total Cost of Living Stress

	R-square:	0.397
	ANOVA:	F = 71.049, sig. = 0.000
	Coefficient	***t-value***
Constant	*-2.125*	*-9.160*
Sitting relative to last year	0.223	7.594
Finding it difficult to separate work and personal/family life	0.194	6.617
More traffic (Neighbourhood perception)	0.145	5.206
Age (Years)	0.008	4.052
Mortgage and worried about repayments	0.336	3.850
Rent but would buy if I could afford	0.333	3.857
Female	0.191	3.429
Physical (QoL dimension)	-0.007	-3.329
Hours per day spent sitting	0.020	3.329
Age x Income Interaction (/100000)	-0.002	-2.182

4.4.3. Geospatial Depiction of Total Cost-of-Living Stress

The final piece of analysis in this paper is to capture a geo-spatial overview of how Total Col Stress may be distributed across the Greater Sydney area. Figure 9 shows another representation of total concern about cost of living: the simple summation of the scores on each of the five scales for each respondent presented on the figure are the sample averages for each SA4 statistical zone (the largest sub-State regions in the Main Structure of the Australian Statistical Geography Standard). It also shows the most recent publicly available data AUO data (from 2021 - https://auo.org.au/using-the-indicators/) for housing stress (the percentage of households spending more than 30% of household income on housing costs) measured at a local government level.

Fig. 9a: AUO Housing Stress Indicator

Fig. 9b: Total CoL Stress

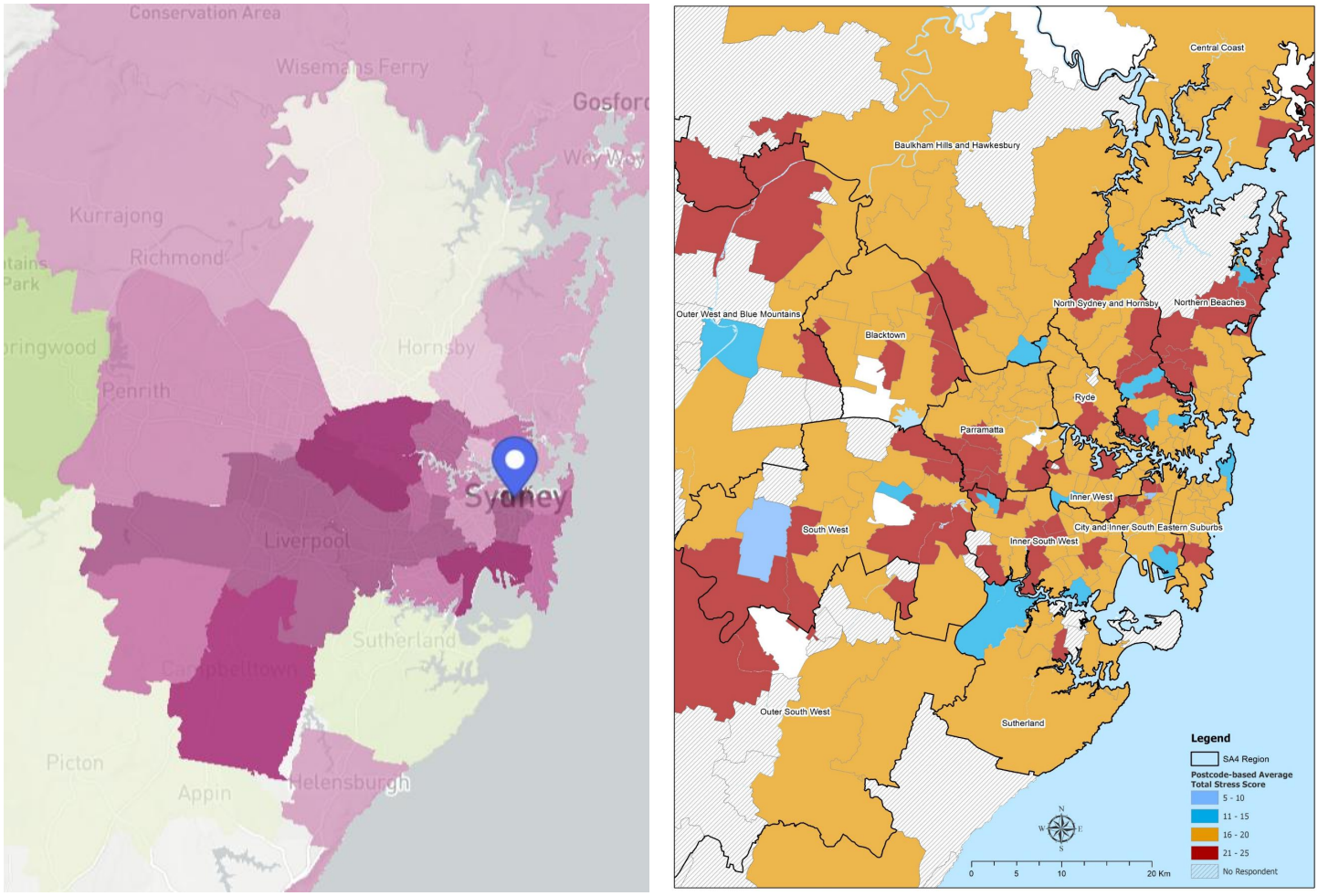

FIGURE 9: Geospatial Overview of Housing Stress vs. Total CoL Stress

The measure calculated in this paper mirrors in broad terms the data from the AUO which has a much more technical definition of housing stress (and housing stress only), in that we see a darker shading in the mid-west and south-west, but the data collected by this study is seemingly more nuanced and picks up a more diverse geospatial range of rising

concern, in part as it incorporates both perceived stress and stress from more potential sources. There are no particularly strong trends that emerge with respect to where pockets of low relative cost of living concern might be located, but there is some evidence that the pockets of the darkest red tend to be associated with areas that are broadly where young families might be more likely to be living (mid-west, outer north and south west, the northern beaches, and the central coast). A higher resolution version of this chart is provided in the appendix.

5. Discussion and Implications

Overall, two-thirds of the sample are more stressed about cost-of-living pressures than 12 months ago. Importantly, each of the measures of stress used in this paper are significantly correlated with each other, indicating that if an individual is stressed on one dimension, that stress is likely to cascade across all dimensions. Females exhibit more stress, which could be attributable to the fact that females are still largely responsible for household shopping and expenditure (Kolpashnikova and Kan 2020). With respect to the clusters of different levels of concern, we find that five exist, with each cluster having a different mix of what they are most concerned about (if at all), and the overall level of total cost-of-living stress being experienced. Of note is that the *highly concerned* segment which is experiencing much greater increases in concern across all the five scale items: housing costs; gas/electricity prices; fuel prices; food and essential prices; and concern about the environment and climate change, is the largest in the cluster identified, accounting for more than one-third of the sample.

Interestingly we do find evidence of subtle differences in sources of these concern, outside of just overall increased concern, specifically that there is a delineation between rising concern from housing affordability and rising concern from the increases cost of food and essentials. When aggregated into a single measure we further find that the clusters identified exhibit significantly different levels of total cost-of-living stress. Specifically, while those who are *highly concerne*d report the highest relative levels of such total stress, the delineation between different pressure points of rising concern is important, as those whose concern is prompted more so by the rising cost of consumables have significantly higher stress than those whose concern is sourced more so from housing costs. This emphasises that a focus on housing stress alone can mask an undercurrent of wider negative impacts (O'Neill et al. 2010, Waldron and Redmond 2016).

The clusters of stress are significantly linked to perceptions of neighbourhood amenity, in particular those who are fortunate enough to exhibit diminishing concerns perceive themselves to be living in more amenable neighbourhoods. There may be a question over causality here, in that those who are financially robust may be able to comfortably afford housing in areas of the city that are generally "better", but there is also the possibility that if you are not under stress, you do view where you live more favourably. With respect to

these neighbourhood perceptions, those who are in the *rising concern (housing)* segment also believe themselves to live in neighbourhoods that are more pleasant and have less traffic, suggesting that the cost-of-living in such neighbourhoods are high, which in turn induces stress when the costs associated with owning or renting increase sharply. The downside is that these areas are perceived as not particularly walkable.

We readily acknowledge that one cannot simply "walk off" any stress associated with the rising cost-of-living, but there is potentially some small financial benefit if an individual is able to lower their transportation costs by opting into active modes. Interestingly, our data does not reveal any systematic relationship between quality-of-life measures and clusters of different cost-of-living concern, which emphasises just how widespread (and potentially hidden) such concern is. Interestingly, we do find that those in the *rising concern (consumables)* cluster are significantly less physically active, and significantly more sedentary; there is thus some preliminary evidence that better ability to make cheaper trips via active modes might not only eliminate some financial pressure, but could also potentially offset some of these poor health measures, acknowledging of course that such a finding is indeed a first insight that requires future research. In Queensland, 50 cent public transport fares were introduced as a cost-of-living initiative, further demonstrating the link between transport and these concerns (SBS 2024).

We find that there is no one hotspot of people in the Greater Sydney region experiencing high levels of total cost-of-living stress, rather that such high levels of concern are distributed widely across the city. For those familiar with Sydney, the hottest spots are seemingly close to places where families and new homeowners might be in a higher concentration. This parallels data from VISA transactions which has recently been made public, which shows that people living in the eastern suburbs, North Sydney and Mosman spent nearly twice as much on dining and entertainment on average than those living in Campbelltown, Mount Druitt or the Blue Mountains (Yin 2024).

This research represents a first step in the literature, to explore these potentially interrelated areas. We know that if people perceive the neighbourhood in which they live more favourably, there are better wellbeing outcomes and people are more inclined to participate in active forms of travel which can lead to better health outcomes. From a transport policy perspective, we do not find any systematic link between cost-of-living related concern and perceptions of neighbourhoods. This in itself is an important finding as it perhaps indicates that these pressures are pervasive and are not exclusively being felt by those in poorer neighbourhoods or solely among those in lower socio-economic groups. This finding speaks to previous work that there are unexpected and often unseen effects of stresses associated with cost of life pressures. From a transport perspective, it means that accessibility and amenity remain important across the city. That said, some transport cost relief may be of great benefit in those areas highlighted in the geospatial overview, typically suburbs where new families settle. Perhaps some free or discounted

weekend travel for families (such they ride all day Sunday for $2.50 fare policy could be resuscitated) could provide wellbeing benefits.

However, should concern be ongoing for a sustained period, it does not necessarily mean that a systematic relationship will not emerge. Indeed, should pressure be sustained, perhaps the amenity of the local neighbourhood will take on increased importance if households are reducing expenditure and shrinking the geographic space over which they engage in activities and travel. Interestingly, we also find that in the mix of concerns, concern about the environment and climate change also increases in much the same way as cost-of-living concerns. There is the natural link between transportation and the environment, to which transport policy makers should continue to strive to improve, and thus reduce those associated indirect costs.

One last way in which housing affordability may impact significantly on transportation networks is via increased suburbanisation as people seek relatively more affordable housing (Farsangi 2024, Yanotti et al. 2024). This has negative consequences on both the cost of the required future infrastructure provision, the capacity of the current road and public transportation networks, and "excessively" long commutes from fringe suburbs to central work locations (Dumas 2024). For cities to be successful, careful consideration needs to be given to managing and resolving housing affordability challenges (va Doorn 2019), as well as the impacts they have on transportation networks. History has shown that such sprawl creates widespread and interconnected issues, affecting the environment and public health, to increasing car dependency, reducing family time, and social isolation due to inadequate public infrastructure.

6. Limitations and Future Research

Given that this paper represents an initial step exploring the nexus of cost-of-living pressure, transportation, neighbourhood perceptions, and health and wellbeing, there are several limitations that should be acknowledged. First, the scales deployed in data collection are broad in nature, and thus likely to be a blunt measure of headline concern rather than anything acute. It also uses scales that are a measure relative to a year prior, meaning that there is no true measure of absolute current-day stress. Future research should also seek to embed more quantifiable levels of stress and/or financial pressure. Related to this, the study also uses an individual's self-reported perceptions as a measure of concern - future research could examine in more detail than we have here the extent to which perceived cost-of-living stress mirror objective measures.

As we looked only at relative changes to levels of stress, rather than the absolute measure of stress (i.e. it is possible that people are more concerned now about food prices than compared to their change in concern about housing, but yet still feel more stressed about housing than anything else). Future research could also examine if different sources of stress are weighted in different ways, for example if having high cost of living stress

related to housing costs, as a more profound impact on overall stress or concern than being highly concerned about the cost of food and essentials. There is much interest in cheaper public transport, and thus research moving forward could also examine how the provision of cheaper fares may impact on household expenditure, potential savings, and thus cost-of-living pressures. Future studies could also seek to look at how the quantum of trip making behaviour may be changing due to budgetary pressures from rising the cost-of-living, and how those changes may impact on measures of social inclusion and subjective wellbeing. This study is cross-sectional in nature, data collected overtime will give a better indication of potential relationships.

Finally, we also acknowledge that this sample does not focus on those individuals who are particularly economically or socially disadvantaged, nor those likely to be in acute housing stress.

7. Conclusion

This paper represents an important first step in the literature, to look at potential links between cost-of-living stress and the perceptions of local neighbourhoods, under the hypothesis that greater pressure about housing affordability, transportation costs, or indeed cost overall could lead to a degradation in how the neighbourhood within which a person lives is perceived. From the literature we know that this in turn could have deleterious effects on wellbeing, physical activity and active travel choices. We find however, that for the present at least, there is no systematic relationship between cost-of-living concerns and such neighbourhood perceptions, with the exception being the fortunate few who are experiencing *diminished concern* who perceive their neighbourhoods to be significantly more amenable than all other groups. This of course, has its own equity concerns vis-à-vis the nature of areas that those who are unaffected by risings costs are likely to live. While there may be no systematic link between these areas, one interpretation could be that the pressures are pervasive over many disparate stratum of society.

What we do find is further confirmation that cost-of-living goes beyond technical measure of housing stress and indeed beyond just housing stress alone. Of relevance is that those who could be classified as having *rising concern (consumables)* have among the highest levels of relative stress. This is to be expected as there are many reports in the general media about spending on eating out and indeed cutting back on meals prepared at home, as being initial strategies to reduce spending. Such cuts to spending are also likely to spill over into discretionary trip making and travel activity patterns overall. We find that there is generally just as much concern about the rising cost of fuel, which is directly related to trip making, further compounding transport accessibility and equity. Overall, our first attempt to investigate the potential nexus of cost-of-living, neighbourhood perception, wellbeing, physical activity and active travel, produces enough evidence and insight to establish that there are potential links which are likely to

play out in unknown ways during cost-of-living crises. We argue that our results are sufficient that research should extend them to transportation costs and trip making more generally under the current spike in general prices and urge other researchers to consider building on these insights.

References

ABS (2022), Population: Census, https://www.abs.gov.au/statistics/people/population/population-census/latest-release, Australian Bureau of Statistics, accessed 24/09/24.

ABS (2024). Consumer Price Index, Australia, https://www.abs.gov.au/statistics/economy/price-indexes-and-inflation/consumer-price-index-australia/jun-quarter-2024, 31/07/2024, accessed 30/09/24.

AIHW (2024), Home ownership and housing tenure, https://www.aihw.gov.au/reports/australias-welfare/home-ownership-and-housing-tenure, accessed 25/09/24

Arundel, R., Li, A., Baker, E., & Bentley, R. (2022). Housing unaffordability and mental health: dynamics across age and tenure. International Journal of Housing Policy, 24(1), 44–74. https://doi.org/10.1080/19491247.2022.2106541

Australian Institute of Health and Welfare 2003. The Active Australia Survey: a guide and manual for implementation, analysis and reporting, Canberra, AIHW.

Awaworyi-Churchill, S. and Smyth, R. (2019). Transport poverty and subjective wellbeing, Transportation Research Part A: Policy and Practice, 124, https://doi.org/10.1016/j.tra.2019.03.004

Baker, E., Pham, N.T.A., Daniel, L. and Bentley, R. (2020). New evidence on mental health and housing affordability in cities: A quantile regression approach, Cities, 96, https://doi.org/10.1016/j.cities.2019.102455.

Bangura, M. and Lee, C.L. (2024). Entry affordability of employment types: Evidence along the theory of full-time and part-time wage differentials, Cities, 153, https://doi.org/10.1016/j.cities.2024.105246.

Bangura, M. and Lee, C.L. (2024). Entry affordability of employment types: Evidence along the theory of full-time and part-time wage differentials, Cities, 153, https://doi.org/10.1016/j.cities.2024.105246.

Bennie, J. A., Pedisic, Z., van Uffelen, J. G. Z., Gale, J., Banting, L. K., Vergeer, I., Stamatakis, E., Bauman, A. E. & Biddle, S. J. H. 2016. The descriptive epidemiology of total physical activity, muscle-strengthening exercises and sedentary behaviour among Australian adults – results from the National Nutrition and Physical Activity Survey. BMC Public Health, 16, 73.

Bhat, C.R. and Guo, J.Y. (2007). A comprehensive analysis of built environment characteristics on household residential choice and auto ownership levels,

Transportation Research Part B: Methodological, 41(5), https://doi.org/10.1016/j.trb.2005.12.005

Bond, L., Kearns, A., Mason, P. et al. Exploring the relationships between housing, neighbourhoods and mental wellbeing for residents of deprived areas. BMC Public Health 12, 48 (2012). https://doi.org/10.1186/1471-2458-12-48

Borgers, A. and Timmermans, H. (1993). Transport Facilities and Residential Choice Behavior: A Model Of Multi-Person Choice Processes, Papers in Regional Science, 72(1), https://doi.org/10.1111/j.1435-5597.1993.tb01862.x

Broadbent, P., Thomson, R., Kopasker, D., McCartney, G., Meier, P., Richiardi, M., McKee, M., and Katikireddi, S.V. (2023). The public health implications of the cost-of-living crisis: outlining mechanisms and modelling consequences, The Lancet Regional Health – Europe, 27, https://doi.org/10.1016/j.lanepe.2023.100585

Brooks, R., Orszag, P.R., and Murdock, W.E. (2024). COVID-19 inflation was a supply shock, https://www.brookings.edu/articles/covid-19-inflation-was-a-supply-shock, 15/08/24, accessed 30/09/24.

CfS (2024). Chronically Unaffordable Housing: A global review of the biggest threat to Sydney's competitiveness, Committee for Sydney (CfS) and Business of Cities Report, https://sydney.org.au/policy-library/chronically-unaffordable-housing/, 06/09/23, accessed 30/09/24.

Chong, F. (2023). Housing Price and Interest Rate Hike: A Tale of Five Cities in Australia, Journal of Risk and Financial Management, 16(2):61. https://doi.org/10.3390/jrfm16020061

Crane, M., Rissel, C., Standen, C., Ellison, A., Ellison, R., Wen, L., and Greaves. S. (2017). Longitudinal evaluation of travel and health outcomes in relation to new bicycle infrastructure, Sydney, Australia, Journal of Transport & Health, 6, https://doi.org/10.1016/j.jth.2017.07.002

Davern, M., Both, A., Murray, K., Roberts, R., and Norzahari, F. (2023). Liveability research creating real world impact: connecting urban planning and public health through the Australian Urban Observatory. Cities & Health, 7(5), 765–778. https://doi.org/10.1080/23748834.2023.2178091

Dumas, D. (2024). Forced to move by the Australian housing crisis: three-hour commutes and 'never mind seeing your family', The Guardian, 02/12/24, https://www.theguardian.com/australia-news/2024/dec/09/forced-to-move-by-the-australian-housing-crisis-three-hour-commutes-and-never-mind-seeing-your-family, accessed 13/01/25.

Dyck, D., Cerin, E., Conway, T., Bourdeaudhuij, I., Owen, N., Kerr, J., and Sallis, J. (2012). Perceived neighborhood environmental attributes associated with adults' transport-related walking and cycling: findings from the usa, australia and belgium. International Journal of Behavioral Nutrition and Physical Activity, 9(1), 70. https://doi.org/10.1186/1479-5868-9-70

Farsangi, E.N. (2024). Australia's housing crisis: bolstering community and individual resilience with meaningful structural reform, The Policymaker, 13/04/24, https://thepolicymaker.jmi.org.au/australias-housing-crisis-bolstering-community-and-individual-resilience-with-meaningful-structural-reform/, accessed 13/01/25.

Haylen, A. (2015). Affordable rental housing: the problem and its causes, NSW Parliamentary Research Service e-Brief (2015), https://www.parliament.nsw.gov.au/researchpapers/Documents/affordable-rental-housing-the-problem-and-its-ca/Affordability%20in%20a%20nutshell%20-%20E-brief%20FINAL.pdf, accessed 14/11/24.

Jones-Rounds, M.L., Evans, G.W. and Braubach, M. (2014). The interactive effects of housing and neighbourhood quality on psychological well-being, Journal of Epidemiology and Community Health, 171-175, https://doi.org/10.1136/jech-2013-202431

Kerr, J., Emond, J., Badland, H., Reis, R., Sarmiento, O., Carlson, J., ... & Natarajan, L. (2016). Perceived neighborhood environmental attributes associated with walking and cycling for transport among adult residents of 17 cities in 12 countries: the ipen study. Environmental Health Perspectives, 124(3), 290-298. https://doi.org/10.1289/ehp.1409466

Kolpashnikova, K., & Kan, M. Y. (2021). Gender gap in housework time: how much do individual resources actually matter? The Social Science Journal, 1–19. https://doi.org/10.1080/03623319.2021.1997079

Lee, S. M., Conway, T. L., Frank, L. D., Saelens, B. E., Cain, K. L., & Sallis, J. F. (2017). The Relation of Perceived and Objective Environment Attributes to Neighborhood Satisfaction. Environment and Behavior, 49(2), 136-160, https://doi.org/10.1177/0013916515623823

Marwal, A. and Silva, E.A. (2023). City affordability and residential location choice: A demonstration using agent based model, Habitat International, 136, https://doi.org/10.1016/j.habitatint.2023.102816.

Mouratidis, K. (2020). Commute satisfaction, neighborhood satisfaction, and housing satisfaction as predictors of subjective well-being and indicators of urban livability, Travel Behaviour and Society, 21, https://doi.org/10.1016/j.tbs.2020.07.006

Murphy, B., Herrman, H., Hawthorne, G., Pinzone, T. & Evert, H. 2000. Australian WHOQoL instruments: User's manual and interpretation guide.

O'Neill, P., Duante-Camacho, O., Casiro, J., Gwyther, G., Phibbs, P., Bryan, D., Rafferty, M., and Allon, F. (2010). The Experience of Mortgage Distress in Western Sydney, Urban Research Centre, University of Western Sydney, http://hdl.handle.net/10453/31157.

Pelclová, J., Frömel, K., & Cuberek, R. (2013). Gender-specific associations between perceived neighbourhood walkability and meeting walking recommendations when walking for transport and recreation for czech inhabitants over 50 years of age. International Journal of Environmental Research and Public Health, 11(1), 527-536. https://doi.org/10.3390/ijerph110100527

Prince, S. A., Lancione, S., Lang, J. J., Amankwah, N., de Groh, M., Garcia, A. J., ... Geneau, R. (2021). Are people who use active modes of transportation more physically active? An overview of reviews across the life course. Transport Reviews, 42(5), 645–671. https://doi.org/10.1080/01441647.2021.2004262

Rummo, P., Guilkey, D., Shikany, J., Reis, J., & Gordon-Larsen, P. (2016). How do individual-level sociodemographics and neighbourhood-level characteristics influence residential location behaviour in the context of the food and built environment? findings from 25 years of follow-up in the cardia study. Journal of Epidemiology & Community Health, 71(3), 261-268. https://doi.org/10.1136/jech-2016-207249

Saberi, M., Wu, H., Amoh-Gyimah, R., Smith, J. and Arunachalam, A. (2017). Measuring housing and transportation affordability: A case study of Melbourne Australia, Journal of Transport Geography, 65, 134-146, https://doi.org/10.1016/j.jtrangeo.2017.10.007.

SBS (2024). Public transport now costs 50 cents in this state, as premier pushes cost of living help, https://www.sbs.com.au/news/article/public-transport-now-costs-50-cents-in-this-state-as-premier-pushes-cost-of-living-help/boa18kus1, 05/08/24,

Srinivasan, S. and Ferreira, J. (2002). Travel behavior at the household level: understanding linkages with residential choice, Transportation Research Part D: Transport and Environment, 7(3), https://doi.org/10.1016/S1361-9209(01)00021-9

Stanford, J. (2023). Profit-Price Spiral: The Truth Behind Australia's Inflation, https://futurework.org.au/wp-content/uploads/sites/2/2023/02/Profit-Price-Spiral-Research-Report-WEB.pdf, 20/02/23, accessed 30/09/24.

Tao, Y. (2024). Linking residential mobility with daily mobility: A three-wave cross-lagged panel analysis of travel mode choices and preferences pre–post residential relocation in the Netherlands. Urban Studies, 61(2), 273-293. https://doi.org/10.1177/00420980231181049

van Doorn, L., Arnold, A., Rapoport, E. (2019). In the Age of Cities: The Impact of Urbanisation on House Prices and Affordability. In: Nijskens, R., Lohuis, M., Hilbers, P., Heeringa, W. (eds) Hot Property. Springer, Cham. https://doi.org/10.1007/978-3-030-11674-3_1.

Waldron, R., & Redmond, D. (2016). "We're just existing, not living!" Mortgage stress and the concealed costs of coping with crisis. Housing Studies, 32(5), 584–612. https://doi.org/10.1080/02673037.2016.1224323

Watkins, M. W. (2018). Exploratory Factor Analysis: A Guide to Best Practice. Journal of Black Psychology, 44(3), 219-246. https://doi.org/10.1177/0095798418771807

Williams SN, Dienes K. The 'Cost of Living Crisis' and its effects on health: A qualitative study from the UK. PsyArXiv; 2022. DOI: 10.31234/osf.io/tr4xf.

Wu, N. and Zhao, S. (2014). Impact of Transportation Convenience, Housing Affordability, Location, and Schooling in Residence Choice Decisions, Journal of Urban Planning and Development, 141(4), https://doi.org/10.1061/(ASCE)UP.1943-5444.0000258

Xu, J., Liu, N., Polemiti, E., Garcia-Mondragon, L., Tang, J., Liu, X., Lett, T., Yu, L., Nöthen, M. M., Feng, J., Yu, C., Marquand, A., Schumann, G., & the environMENTAL Consortium (2023). Effects of urban living environments on mental health in adults. Nature medicine, 29(6), 1456–1467. https://doi.org/10.1038/s41591-023-02365-w

Yanotti, M.B., Kangogo, M., Wright, D., Sarkar, S. and Lyu, F. (2024). House price dynamics and internal migration across Australia, AHURI Final Report No. 421, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/421, DOI: 10.18408/ahuri4130401.

Appendix

Larger Resolution Map of Total CoL Stress