

A RURAL-URBAN DIVIDE? ATTITUDINAL DIFFERENCES TOWARDS WATER RESTRICTIONS IN SOUTH AUSTRALIA

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ABSTRACT: This paper examines differences in attitudes towards water restrictions in rural and urban areas in South Australia. The areas differed on the relative importance of future water shortages, whether uniform restrictions should apply across the state and the disruptive nature of restrictions. An analysis of the determinants of the attitudinal differences revealed that the perception of a more plentiful water supply in the rural study area led to a perception that future water shortages were of lesser importance to their households compared to those in the urban areas. This may also account for their attitudinal differences on the uniformity of restrictions across the state. Differences in attitudes towards the disruptive nature of restrictions were significantly linked to the affluence of the urban households. Apart from these differences, generally, regardless of location, demographics and socio-economic conditions, the results showed support for restrictions and their value in assisting households to conserve water.

KEY WORDS: Uniform restrictions; water conservation; lifestyle.

ACKNOWLEDGEMENTS: The Australian Research Council for funding the research.

1. INTRODUCTION

Globally, non-price mechanisms are generally the favoured option for reducing water demand as increasing the price of water raises questions of equity, and water as a basic right (Olmstead and Stovin, 2008). During the protracted water shortages from the late 1990s to early 2010 across Australia, water restrictions were widely applied as a means of water demand management. By 2007, 80 percent of people in urban areas were under restrictions (Allen Consulting Group, 2007). While recent studies have shown the efficacy of restrictions in reducing water use (ACTEW, 2010; Neal *et al.* 2010; Spaninks, 2010), they did not examine the concomitant attitudes towards restrictions, or behavioural intentions if restrictions were to continue. This paper examines the attitudes of residents towards mandatory water restrictions in three parts of South Australia which differed in their socio-economic characteristics, location (metropolitan and regional), and severity of water restrictions.

Attitudes of indifference towards water conservation may lead to low levels of compliance with restrictions, though the relationship between attitudes and behaviours is complex. Attitudinal studies can be limited in that the attitude-behaviour link is based on participants' self-reported intentions rather than manifest behaviour and a tendency of participants to answer questions in a socially desirable way (De Oliver, 1999).

Numerous studies (Cottrell, 2003; Berenguer *et al.*, 2005; Kaiser *et al.*, 2005) within the discipline of psychology have sought to unravel and model the factors influencing behaviour, of which attitudes is one. Delving into psychology is not the intent of this paper; nonetheless, inner feelings as a determinant of behaviour should be borne in mind: ‘...aspirations towards water conservation are in tension with the pleasure derived from water’ (Head and Muir, 2007, p. 902), thus pro-environmental attitudes, even ‘... high levels of environmental concern’ do not necessarily translate into corresponding behaviours (Berenguer *et al.*, 2005; Macnaghten, 2003 cited in Whitmarsh, 2008). In short, it is water conserving behaviours (rather than attitudes) that determine the effectiveness of restrictions (Gregory and Di Leo, 2003). Nonetheless, attitudes are worth examining as they can provide insight into the efficacy of water demand management strategies (c.f. Moore *et al.*, 1994), of which water restrictions is the focus in this paper.

While compliance with restrictions does not necessarily arise from pro-environmental attitudes, studies have shown that particularly where there are strong pro-environmental attitudes (Corral-Verdugo *et al.*, 2002; Berenguer, *et al.*, 2005) people are more accepting of restrictions. Positive attitudes, self-stated compliance with restrictions and an intention to remain compliant have been documented despite respondents reporting on deterioration in their gardens and plants dying as a result of less watering (IPART, 2007).

Conversely, reasons for non-compliance are more difficult to unravel. A distrust of the service provider, or a belief that compliance (with restrictions) would not make a difference to the problem, or that there are more important environmental issues may lead to a lack of commitment to water conservation (Howarth and Butler, 2004; Jorgensen *et al.*, 2009). Other studies have found that compliance is contingent on neighbours abiding by the rules (Atwood *et al.*, 2007); or feelings that water conservation requires too great an effort (Seligman and Finegan, 1990 cited in Syme *et al.*, 2000; Cottrell, 2003; Gilg and Barr, 2006; Kenney *et al.*, 2008). The lack of pricing incentives and penalties led to low compliance in over half of the residents across 40 urban water utilities in Southern California during the drought of 2008 (Dixon *et al.*, 1996 cited in Olmstead and Stavins, 2008).

Aims of the Study

The aims of the study were to (1) garner residents’ attitudes towards water restrictions in three areas of South Australia, namely an area in the

northern part of greater metropolitan Adelaide (henceforth referred to as Metro North), one in the eastern metropolitan area (Metro East), and the country town of Mount Gambier in south-east South Australia; and to (2) identify determinants of attitudinal differences towards water restrictions.

The water service provider selected the three study areas, the two urban areas were chosen on the basis of their differing socio-economic profiles. An Index of Relative Socio-economic Disadvantage and Advantage (SEIFA) scores socio-economic advantage and disadvantage, education and resources and is a measure of the area, rather than individuals, although it indicates that populations with similar incomes, education and community resources tend to live in close proximity. Approximately 67% of the population in Metro North are in the top four (decile 1-4) disadvantaged SEIFA, while the majority of the population of Metro East are in the most advantaged deciles 9 and 10 for South Australia. Regional householders are at decile 4; a relatively disadvantaged position (Australian Bureau of Statistics, 2008).

Mount Gambier was chosen on the untested assumption that there existed attitudes of plentiful water supplies. Reasons for the assumption may be attributable to the fact that groundwater (and not the Murray River) is the source of the towns' water supply, reinforced by the dominant presence of the Blue Lake—a surface expression of groundwater—in the town. Also, the town was on the less restrictive Permanent Water Conservation Measures (PWCM) rather than water restrictions (see Context).

Context

In both water restrictions and PWCM the rules governed the type of water use activity, the timing of activities and the technologies permitted (Chong *et al.*, 2009). External water consuming activities such as washing boats and vehicles, washing paving and garden watering were mainly targeted. Differences between the two measures extended across the number of hours and day(s) that gardens could be watered. Under restrictions sprinklers were banned at all times whereas under PWCM sprinklers were permitted within restricted hours. The less rigorous PWCM were aimed at long term water efficiency and 'sensible water use' (SA Water 2007). Breaches of PWCM and restrictions carried the same penalty—a fine of AUD\$345; prior to 2008-2009 it was AUD\$315 (SA Water, 2009b).

Adelaide relies predominantly on the Murray River for its water supply, with a greater proportion of the supply sourced from the river in drought years. The supply is supplemented with water from two local reservoirs that receive rainfall-runoff. On average, Adelaide receives 529 mm of rainfall falling over 87 rain days (based on 140 years of data), but at the time of the study rainfall was 88% of the average and temperatures were higher than average (Bureau of Meteorology, 2010a; 2010b). In the water year ending 30 June 2009, 85.7% of SA Water consumer's supply was sourced from the Murray River (SA Water, 2009a), however, well below average rainfall and inflows in parts of the catchment between 2002 and 2009 (the time of this study) meant that the Murray-Darling River system was also under severe stress, hence the need for ongoing water restrictions (PIRSA, 2009; Bureau of Meteorology, 2010a). In Adelaide mandatory water restrictions had been in place since mid-2003 and became more restrictive as the drought progressed.

Mount Gambier, in the southeast of the state is wetter and cooler (than Adelaide) with a long-term mean annual rainfall of 775 mm, falling on average over 121 days (based on 113 years of data). Mean maximum and minimum temperatures are below those of Adelaide (Bureau of Meteorology, 2010c; 2010d).

2. METHODOLOGY

Data Collection

Data for this paper were collected via a postal survey and a follow-up telephone interview conducted between July and October 2009. Survey respondents were drawn by the water service provider from their customer database for the study areas and included adults who were responsible for paying the water bill, resided in an individually metered dwelling, had lived at the address for over 12 months and none of the family members were employees of the service provider. Every tenth householder eligible for the study was identified for inclusion until a non-stratified sample population of 3,000 householders was achieved. Completed numerically identified surveys were returned in a de-identified form to the research team, while the consent form (agreeing to a follow-up telephone interview) was returned to the water service provider who then passed the contact details on to a computer-assisted telephone interviewing (CATI) company to obtain additional data. Names and addresses of participants were retained by the service provider. Survey responses were not accessible to the service provider.

Ethics approval to conduct the research was obtained from the Flinders University Social and Behavioural Research Ethics Committee and the design of the survey was vetted by personnel at the water service provider.

In total, 539 (18%) usable surveys were received—227 for Metro East, 150 for Metro North and 162 for Mount Gambier, although there was some variation across individual questions. The CATI obtained data from 438 completed interviews. The data are skewed towards older, single, and coupled household occupants. Without access to the customer database it was not possible to delve deeper into the representativeness of the sample. Further, as the largest regional town in South Australia, Mount Gambier with its population of 23,494 (Australian Bureau of Statistics, 2007) is not typical of smaller and more remote Australian towns or—in terms of its climate and water supply—those in arid regions.

Survey Content and Statistical Analysis

The survey comprised 34 structured questions that asked for information on householders' demographics and attitudes towards water conservation and restrictions (Table 1). Some of questions comprised several sub-questions. The survey used a combination of 'tick the most appropriate box' and 7-point Likert scale responses to indicate respondents' agreement with or acceptance of statements and questions. Respondents were given the opportunity to provide open-ended comments. Two questions addressing attitudes towards the importance and impact of water shortages were also included. Where appropriate, qualitative comments provided by respondents are included in the results. Statistical analyses were carried out using SPSS version 17.

The overall survey response rate was 18% which, given the relatively high number of response options in the survey, resulted in low cell frequencies for certain items and response categories. For the majority of survey items, responses on 7-point Likert scales were collapsed to three categories (acceptable, neutral, unacceptable) in order to achieve viable cell frequencies for analysis. Although the relevant variables were recoded to account for low cell frequencies, the low response frequencies nonetheless present a limitation to the study, and impact on confidence intervals for all three geographical cohorts. For example, collapsing categories to achieve cell frequencies for analysis potentially masks subtle (locational) differences between response categories on either side

of the importance, acceptability, or agreement spectrum. Chi-square tests (at 95% confidence interval) were applied to ascertain whether differences observed between the three study areas were statistically significant.

Table 1. Survey Questions on the Attitudinal Drivers of Water Conservation. Source: the Authors.

Focus of survey questions	
1)Water restrictions	<p>Acceptability of water restrictions through summer.</p> <p>Water restrictions all year round.</p> <p>The same level of water restrictions across the whole of the state.</p> <p>Penalties for anyone that fails to comply with water restrictions.</p> <p>I don't believe that water restrictions work to conserve water.</p> <p>Water restrictions have helped my household to conserve water.</p> <p>Water restrictions need to be better enforced.</p> <p>Water restrictions are quite generous given current water shortages.</p> <p>Water restrictions disrupt my household's way of life.</p>
2)Importance of water shortages	<p>How important or unimportant do you regard water shortage issues in your community?</p> <p>How large do you think the impact of future water shortages (if any) will be on your household?</p>

3. DEMOGRAPHIC PROFILE OF THE RESPONDENTS

A summary of respondents' gender, age, income, education, employment and household size is given in Table 2. For the demographic and socio-economic variables, study area differences were not significant for sex, employment status or household size, but were evident for age, income and education.

Table 2. Demographic and Socio-economic Characteristics of Survey Respondents in the Three Areas. Source: the Authors

Variable	Area			χ^2 (df)	p
	Metro East n (%)	Metro North n (%)	Regional n (%)		
Gender				0.32 (2)	0.85
Male	128 (56.1%)	80 (53.3%)	90 (55.9)		
Female	100 (43.9%)	70 (46.7%)	71 (44.1)		
Age				24.42 (10)	0.007
18-29	0 (0)	8 (5.3)	8 (4.9)		
30-39	15 (6.6)	13 (8.7)	11 (6.8)		
40-49	36 (15.9)	32 (21.3)	36 (22.2)		
50-59	60 (26.4)	46 (30.7)	50 (30.9)		
60-69	69 (30.4)	30 (20.0)	36 (22.2)		
70+	47 (20.7)	21 (14.0)	21 (13.0)		
Income				73.8 (16)	<0.001
< \$10,400	2 (1.0)	5 (3.9)	2 (1.4)		
\$10,400 - \$20,800	11 (5.6)	17 (13.3)	17 (12.1)		
\$20,801 - \$31,200	15 (7.6)	19 (14.8)	15 (10.7)		
\$31,201 - \$41,600	9 (4.5)	14 (10.9)	16 (11.4)		
\$41,601 - \$52,000	15 (7.6)	8 (6.3)	9 (6.4)		
\$52,001 - \$78,000	30 (15.2)	26 (20.3)	37 (26.4)		
\$78,001 - \$104,000	25 (12.6)	23 (18.0)	20 (14.3)		
\$104,001 - \$156,000	36 (18.2)	11 (8.6)	16 (11.4)		
> \$156,000	55 (27.8)	5 (3.9)	8 (5.7)		

Table 2. Continued. Source: the Authors

Variable	Area			χ^2 (df)	p
Education				89.26 (10)	<0.001
Completed secondary	32 (14.2)	55 (37.4)	56 (35.7)		
Partial uni. or tech.	9 (4.0)	7 (4.8)	10 (6.4)		
Completed tech.	38 (16.8)	33 (22.4)	37 (23.6)		
Completed undergraduate	62 (27.4)	24 (16.3)	25 (15.9)		
Completed postgrad.	78 (34.5)	13 (8.8)	13 (8.3)		
Other	7 (3.1)	15 (10.2)	16 (10.2)		
Employment				13.33 (8)	0.1
Full-time	86 (44.8)	58 (42.3)	76 (51.0)		
Part-time	45 (23.4)	18 (13.1)	25 (16.8)		
Seeking work	3 (1.6)	4 (2.9)	5 (3.4)		
Unemployed	5 (2.6)	4 (2.9)	0 (0)		
Home maker	11 (5.7)	5 (3.6)	6 (4.0)		
Pensioner	42 (21.9)	47 (34.3)	35 (23.5)		
Student	0 (0)	1 (0.7)	2 (1.3)		
Household size				3.81 (8)	0.87
One person	37 (16.2)	22 (14.6)	26 (16.1)		
Two persons	105 (46.1)	66 (43.7)	70 (43.5)		
Three persons	39 (17.1)	26 (17.2)	31 (19.3)		
Four persons	33 (14.5)	24 (15.9)	18 (11.2)		
Five or more	14 (6.1)	13 (8.6)	16 (9.9)		

Study area differences in respondents' age were driven by lower than expected cell frequencies of individuals between 18 and 29 in the Metro East region ($z=-2.6$). The number of people per household was skewed towards singles and couples (62.3% East, 58.3% North, 59.6% Mount Gambier) which is probably a result of the slightly older age of the entire survey sample. Income and education have been used as proxies for socio-economic status with differences being observed between the three areas for both variables. Statistically significant differences in household income between the three study areas were due to higher cell counts for an annual household income greater than \$156,000 in the Metro East study area ($z=4.9$). In contrast, observed frequencies of households with

an income of more than \$156,000 were significantly lower in Metro North ($z=-3.2$) and Mount Gambier ($z=-2.7$). Education levels for the three areas were consistent with income data. Residents in Metro North and Mount Gambier were more likely to have only completed secondary education ($z=2.4$ and 2.1 , respectively) than those in Metro East ($z=3.7$), while Metro East respondents were more likely to have completed an undergraduate ($z=2.1$) or postgraduate degree ($z=5.1$), and less likely to have completed other forms of qualification ($z=-2.3$). Metro North and Mount Gambier respondents were less likely to have completed a postgraduate degree ($z=-3.0$ and $z=-3.2$, respectively). Taken together, these results confirm the existence of significant socio-economic status differences between the three areas when education and income are used as proxy indicators.

4. ATTITUDES TOWARDS WATER RESTRICTIONS

Response homogeneity between study areas was observed for items addressing respondents' views on year round water restrictions, penalties for failure to comply with restrictions, whether restrictions work to conserve water, whether restrictions have helped them conserve water and whether respondents thought restrictions needed better enforcement (Table 3). In contrast, significant differences between attitudes were found for whether it is acceptable to have restrictions through summer, whether uniform restrictions should apply across the state (South Australia), whether restrictions were disrupting their way of life, and were marginally significant for whether respondents considered restrictions generous. Only those questions where significant regional differences were found are discussed.

Table 3. Significance of Differences Between Study Areas in Relation to Attitudes Towards Water Restrictions and the Impact and Importance of Water Shortages. Source: the Authors.

Attitudinal variable	χ^2 (df)	p	Cramer's V
Water restrictions through summer.	12.18 (4)	.02	.11
Water restrictions all year round.	4.07 (4)	.40	.06
The same level of water restrictions across the whole of South Australia.	73.89 (4)	<.001	.26
Penalties for anyone that fails to comply with water restrictions.	5.62 (4)	.23	.07
I don't believe that water restrictions work to conserve water.	2.77 (4)	.60	.05
Water restrictions have helped my household to conserve water.	7.96 (4)	.09	.09
Water restrictions need to be better enforced.	3.70 (4)	.45	.06
Water restrictions are quite generous given current water shortages.	9.09 (4)	.06	.09
Water restrictions disrupt my household's way of life.	18.87 (4)	<.01	.13

Attitudes Towards Water Restrictions During Summer

The majority of respondents indicated that water restrictions through summer were 'acceptable' (80.1%), while only a small proportion were neutral (9.0%) or considered restrictions 'unacceptable' (10.9%). Area differences were due to a smaller proportion of Metro East residents who were neutral (4.9%, $z=-2.0$) compared to Metro North (11.3%) and Mount Gambier respondents (12.7%). Further, marginally significant tendencies were observed with fewer residents from Mount Gambier stating that summer restrictions were 'unacceptable' (6.3%, $z=-1.7$)

compared to Metro North (12.0%) and Metro East (13.4%) respondents. The proportion of respondents who indicated that restrictions through summer were an 'acceptable' way to conserve water was relatively similar (81.7%, 76.7% and 81.0% for Metro East, Metro North and Mount Gambier, respectively).

Attitudes Towards the Uniformity of Water Restrictions Across the State

More pronounced differences between the three areas were observed on the issue of whether water restrictions should be uniform across the state. Overall, most survey participants regarded this as an 'acceptable' way to conserve water (45.6%), compared with 36.6% who regarded state-wide restrictions as 'unacceptable' or who were neutral (17.8%). Area-specific response frequencies are shown in Figure 1. Mount Gambier respondents considered such restrictions 'unacceptable' (63.5%) significantly more often ($z=5.6$) compared with Metro East (28.1%) and Metro North respondents (20.7%). The latter two cohorts in turn thought of state-wide restrictions as 'unacceptable' significantly less often ($z=-2.1$ and -3.2 , respectively). Mount Gambier respondents found such restrictions 'acceptable' significantly less frequently (25.2%, $z=-3.8$) than Metro North respondents (59.3%, $z=2.5$). Mount Gambier residents were also less frequently neutral (11.3%, $z=-1.9$), than Metro North (20%) and Metro East (21.0%) residents.

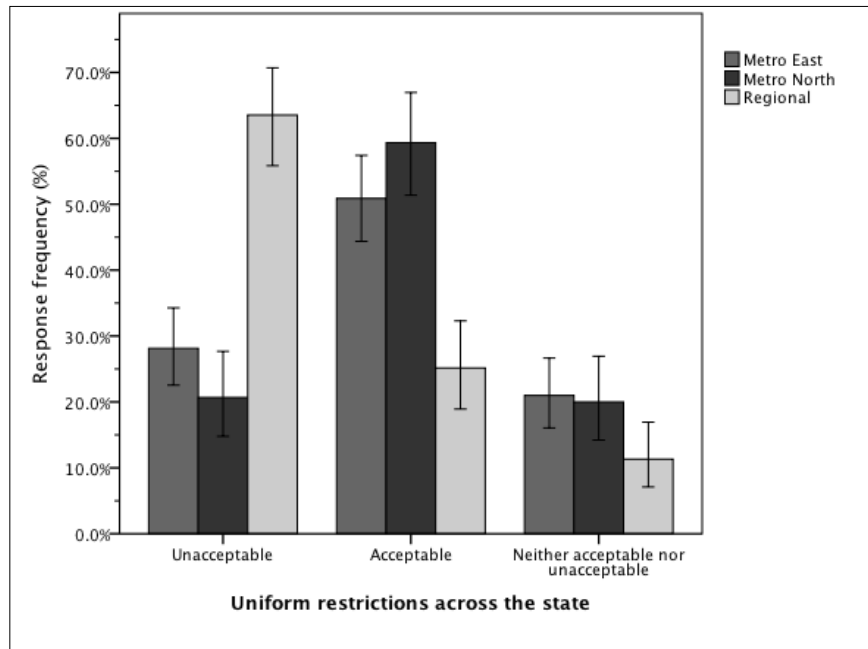


Figure 1. Area-specific Response Frequencies (and 95% Confidence Intervals) for Acceptability of Uniform Water Restrictions Across the State. Source: the Authors.

These patterns suggest that Mount Gambier residents articulated their disapproval of uniform restrictions more frequently, and were less frequently neutral on the matter than their Metro counterparts, while Metro North respondents were significantly more often in favour of the same level of restrictions across the state.

Attitudes Towards the Disruptive Nature of Water Restrictions

One of the factors influencing water conservation behaviours and compliance with restrictions may be the level of personal effort or discomfort associated with abiding by the restrictions. Across the three areas the majority of respondents reported that restrictions were not disruptive to their household (58.3%), while almost a quarter of all householders felt that restrictions were disruptive (23.1%) and 18.6% were neutral (Figure 2). A larger proportion of Metro East residents

reported restrictions to be disruptive (29.5%, $z=2.0$), while there were significantly fewer Mount Gambier residents who felt this way (12.0%, $z=-2.9$). Moreover, Mount Gambier residents disagreed more often on restrictions being disruptive (70.3%, $z=2.0$) compared to their Metro East (50.9%) and North (57.0%) counterparts.

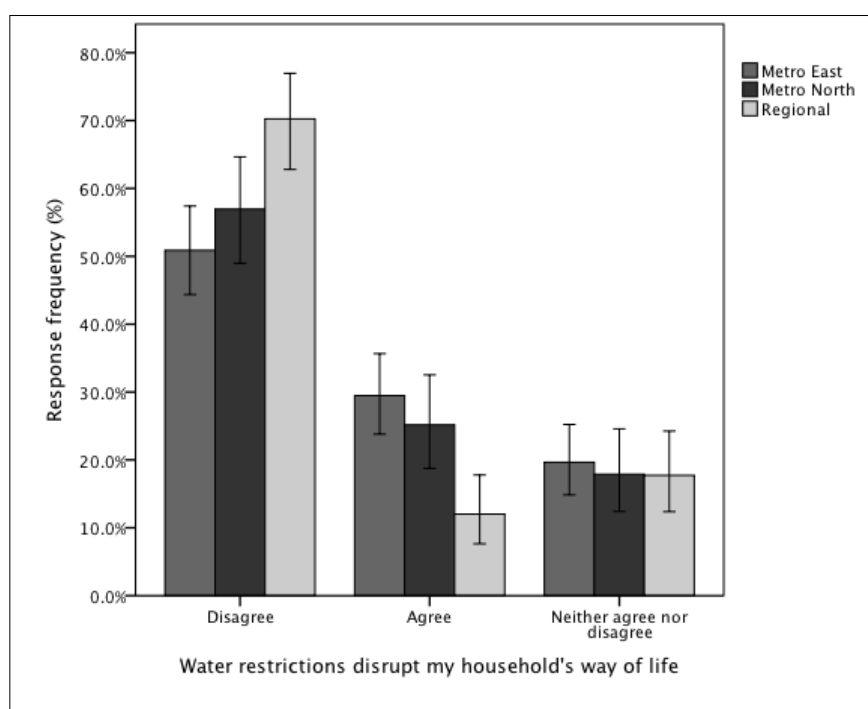


Figure 2. Attitudes, by Study Area, Towards the Disruptive Nature of Water Restrictions. Source: the Authors

Attitudes Towards the Generous Nature of Water Restrictions

The majority of respondents considered restrictions to be generous (50.6%), followed by 30.5% who were neutral; 18.9% thought that restrictions were not generous. Differences were driven by a smaller proportion of residents from Mount Gambier thinking that restrictions were not generous (11.6%, $z=-2.1$) compared to the urban respondents (Metro North: 22.7%; Metro East: 21.5%). There were no differences

between study areas with regards to neutral responses or generous water restrictions.

5. BELIEF IN THE IMPORTANCE AND SEVERITY OF WATER SHORTAGES

Two questions were included in the survey to examine the link between the perceived impact of water shortages and individuals' views on water restrictions. The first question asked respondents how important or unimportant they considered water shortages in their community, and the second, the extent of the anticipated impact of future water shortages (if any) on their household. For both survey items, significant differences between study areas were obtained (Table 4).

Table 4. Significance of Differences Between Study Areas on the Impact and Importance of Water Shortages. Source: the Authors.

Variable	χ^2 (df)	p	Cramer's V
How important or unimportant do you regard water shortage issues in your community?	14.86 (2)	<.01	.19
How large do you think the impact of future water shortages (if any) will be on your household?	34.28 (10)	<.001	.18

Belief in the Importance of Water Shortages

Overall, most participants regarded water shortages as 'important' to their community (94.6%), with the rest being either neutral (3.2%) or felt that the issues were 'unimportant' (2.2%). To achieve viable cell frequencies for analysis, the latter two response options were collapsed into one category. Area differences were driven by a larger proportion of Mount Gambier individuals being neutral or who regarded water shortages as 'unimportant' to their community (11.9%, $z=3.1$) than in Metro East (2.4%) or Metro North (2.8%). There were no differences between study areas in response frequencies for water shortages being 'important'.

Belief in the Severity of Water Shortages

Most respondents thought that future water shortages would have a moderate impact (37.5%) on their household, followed by individuals who thought the impact would be small (20.9%), large (20.1%), very large (10.5), hardly noticeable (8.3%), or no impact at all (2.6%). When the distribution across impact levels is represented graphically (Figure 3), area-specific patterns are apparent: Mount Gambier residents estimated the impact of future water shortages on their households to be smaller (aggregated, 44.7% considered the impact to be less than moderate), compared to Metro East (25.5%) and Metro North residents (27.6%). Conversely, Metro East and Metro North residents more frequently deemed water shortages would have a larger effect than respondents from Mount Gambier (aggregates for moderate, large and very large impact: 74.6% in Metro East, 72.4% in Metro North and 55.3% in Mount Gambier).

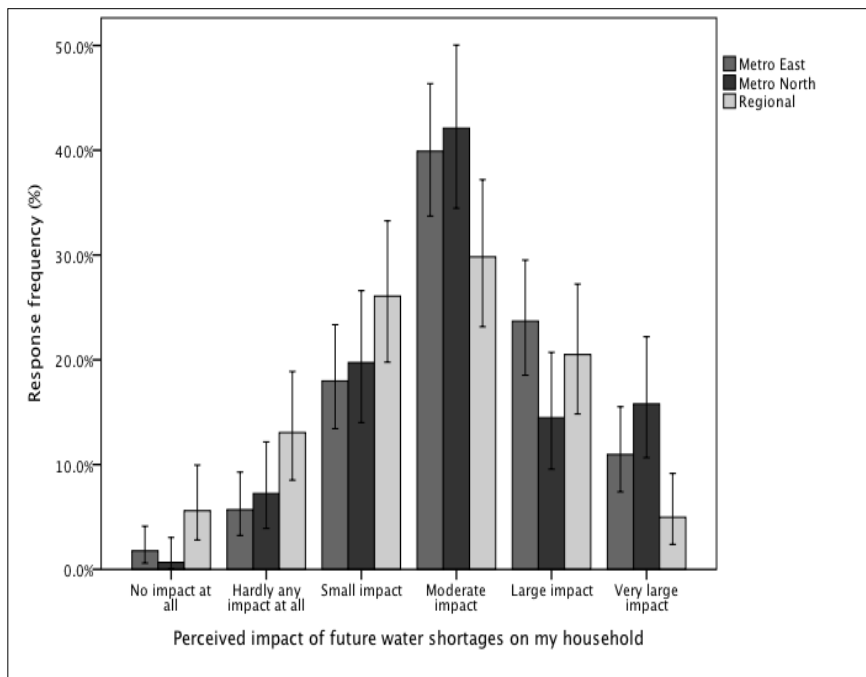


Figure 3. Perceived Impact Levels of Future Water Shortages in the Three Study Areas. Source: the Authors.

Inspection of the standardized residuals confirmed that Mount Gambier respondents more often reported that future water shortages would have no (5.6%, $z=2.4$) or a barely noticeable impact (13.0%, $z=2.1$) on their household relative to respondents from the Metro East (1.8% and 5.7%) or Metro North (0.7% and 7.2%). Furthermore, Mount Gambier residents significantly less often stated that future shortages would have a very large effect on their household (5.0%, $z=-2.2$), whereas more Metro North residents thought the impact on their household would be very large (15.8%, $z=2.0$).

Summary of the Regional Differences

The above results warrant the following conclusions: relative to their Metro counterparts, Mount Gambier residents deemed water shortage issues as ‘unimportant’ or were neutral on the matter more often, and significantly more often anticipated that future water shortages would have a small impact on their household. These findings and the fact that there were no substantial differences between the two Metro areas suggest that attitudes towards restrictions might be driven by imminent exposure to water shortages and restrictions and past experiences (c.f. Pearce *et al.*, 2010).

6. ASSOCIATION BETWEEN DEMOGRAPHIC AND SOCIO-ECONOMIC FACTORS AND ATTITUDES

Examination of socio-economic and demographic differences between the three locations yielded significant results for age, income and education. Age was marginally associated with attitudes towards water restrictions being generous [$\chi^2(10)=17.15$, $p<.08$], as well as the anticipated impact of future water shortages [$\chi^2(10)=18.87$, $p<.05$]. The Cramer’s V test for both associations was below 0.15, suggesting a weak association between age and the two attitudinal variables. Income was associated with perceptions on whether restrictions are acceptable throughout summer [$\chi^2(4)=11.73$, $p<.05$], are generous [$\chi^2(16)=27.09$, $p<.05$] and marginally with the importance of water shortages [$\chi^2(2)=5.34$, $p<.07$]. Cramer’s V fell consistently below 0.2, hence the strength for all three associations between income and attitudes can be regarded as weak. Finally, education was significantly associated with whether water restrictions are considered generous [$\chi^2(10)=19.81$, $p<.05$], yet the association was of low strength.

Implications of the Findings

The results imply that for the majority of attitudes examined, location is a minor aspect to be considered when trying to understand the predictors and drivers of attitudes towards restrictions. The associations between area and some of the attitudes examined are possibly mediated through differences in the demographic and socio-economic composition of the three locations. The association between age, income or education and whether water shortages are considered generous was stronger (Table 3) than the association for this variable and study area, which suggests that variables other than location are linked to respondents' attitudes. Only two attitudinal variables did not show an association with demographic or socio-economic variables, namely the acceptability of uniform restrictions and whether restrictions are disruptive to respondents' way of life.

7. DISCUSSION

In general, factors that facilitate favourable attitudes towards restrictions include:

- The importance placed on the water shortage issue and associated impacts, and
- Restrictions are not disruptive to one's lifestyle.

In general, factors that may deter compliance with restrictions include:

- Issues of fairness,
- The value associated with the water-consuming behaviours to lifestyle or comfort, and
- An attitude that water is not such an important issue.

Participants in the three areas differed in their attitudes towards water restrictions as influenced by the varying socio-economic and demographic composition of each area. As a cohort, Metro East residents (socio-economically advantaged; climate is marginally hotter and drier than Mount Gambier) can be defined as being:

- Less likely to find uniform restrictions across the state unacceptable,
- More likely to find uniform restrictions across the state acceptable, and
- More likely to regard water restrictions as disruptive to their way of life.

The findings for Metro North residents were less conclusive, and the only statements which can be made are that as a group, Metro North respondents (socio-economically disadvantaged; climate as for Metro East) were:

- Less likely to find uniform restrictions across the state unacceptable, and
- More likely to think that future water shortages would have a very large impact on their household.

In contrast, Mount Gambier respondents (relatively disadvantaged socio-economically; marginally wetter and cooler climate than the Metro areas) as a group were:

- More likely to perceive uniform restrictions as unacceptable, less likely to find such state-wide restrictions acceptable and less likely to be neutral on the matter,
- More likely to consider water shortages unimportant,
- More likely to believe that water shortages would have little or no impact on their household and less likely to regard future water shortages as having a very large impact on them, and
- Less likely to think of water restrictions as disruptive and more likely to consider restrictions not disruptive to their way of life.

Based on these findings, two main attitudinal differences are discussed. Firstly the perception of a more plentiful water supply (in Mount Gambier) and secondly, the disruptive nature of restrictions (in Metro East). As with our study, others (Berenguer *et al.*, 2005) have found distinct differences between people living in urban and rural areas in relation to their attitudes.

Perceptions of a Plentiful Water Supply

While restrictions are seen by some to be a more equitable form of water demand management compared to pricing (Chong *et al.*, 2009), this is not so where the availability of water is perceived to be different. Perceptions of a more plentiful water supply in Mount Gambier may account for the differences in attitudes towards restrictions compared to those living in the urban areas, as highlighted in the comment:

'I feel strongly that one of the few positives for residents in the south-east is the water supply and I would oppose restrictions/measures that are necessary in Adelaide being applied here'.

Similar sentiments were articulated in the media a year earlier (June 2008) but still during the drought period. The article emphasised Mount

Gambier's '... high rainfall and secure water supply' and continued with comments from a resident, new to Mount Gambier from Adelaide, in which they contrasted the restrictiveness of the metropolitan restrictions to the Mount Gambier area where 'Even without doing anything, the grass is green ...'. The article implied that many people were considering moving to the 'greener pastures' for the 'much better supply of water' and to '... escape the effects of the drought and ... live in a region where they can water their gardens' (Jenkin, 2008).

Similarly, in New Zealand (New Zealand Ministry for the Environment, 2009) and elsewhere in Australia (Nancarrow *et al.*, 2002) views on the adequacy of water resources were found to influence water conserving behaviours and attitudes towards restrictions. In the former study the authors report that despite pro-environmental attitudes and a belief in the importance of not being wasteful with water, such attitudes did not translate into water conserving behaviours—a factor attributed to their perception that the water situation was not yet that dire. In the latter study the authors comment that while initially there was some aversion to water restrictions in Perth, it was the prolonged water shortages and increase in the severity of the drought that led residents to a realisation of the necessity for restrictions and, as a result, ultimately led them to abide by and become 'reasonably tolerant' of them (Nancarrow *et al.*, 2002). In this study the authors are not suggesting that the Mount Gambier respondents did not comply with restrictions because apart from the *level* of restrictions, generally there were positive attitudes towards restrictions. The results merely highlight how attitudinal differences have influenced residents' willingness to accept uniform restrictions.

Further Discussion on the Perceptions of Regional Respondents

A further explanation for the reticence towards uniform restrictions may be their non-reliance on the Murray River as a water supply, though this is speculation. Nonetheless, the qualitative data appear to support this, as comments reveal an antagonism towards paying the Murray River levy:

'Why do I have to pay the 'Save the Murray' levy when I live 300 kilometres from the Murray and I do not use that water?'

'People are not concerned with the cost of water, it's the rip off service charges and levy'

Yet, due to the state-wide water pricing policy (National Water Commission, 2007), Mount Gambier and Adelaide residents pay the same

amount per volume of water consumed despite the higher operating costs in the rural area (Rabone, 2006). In short, Adelaide's water-consumers subsidise prices in the rest of the state. Unlike much of rural South Australia, because residents of Mount Gambier do not rely on the Murray River, the urban-rural differences outlined in this paper may not apply to other regional towns that are dependent on the river supply.

Other speculative explanations are that rural residents perceive urbanites as wasteful water users (c.f. Crase *et al.*, 2007; Pearce *et al.*, 2010), however, another paper in this study which examines the relationship between attitudes and *actual* water use found no significant relationship between location and water consumption. Rather, the results show a correlation between high incomes and high water users; while lower income households and larger households (number of occupants) used less water per capita regardless of whether they were urban or rural.

Although not dealing with water restrictions, other studies (Carruthers *et al.*, 2006; Alexander *et al.*, 2008) identified similar feelings of mistrust, apprehension and community resistance towards water resource management issues in the Mount Gambier region. Again, although speculative, such perceptions may be indicative of a greater level of conservatism and scepticism in rural as opposed to urban populations.

The Disruptive Nature of Water Restrictions

The second major attitudinal difference, in particular between Metro East and Mount Gambier, was on the disruptive nature of restrictions. However, it must be noted that the reference point was different in each location as at the time of the study enhanced restrictions applied only to the urban (Metro) areas, whereas Mount Gambier was subject to the lesser PWCM. Similarly, Chong *et al.* (2009) note that where low level restrictions do not hinder lifestyle, even though they may reduce flexibility, people are more accepting of them than in areas with more restrictive rules where, for example, sprinklers are banned.

Shove (2002) theorizes that the duration of showers and bathing is more a function of comfort than cleanliness; while Randolph and Troy (2008) cite examples of water use behaviour being determined by the convenience of the technologies involved. Aversion to restrictions may arise when there is a loss of choice in how or when water can be used inside and outside of the home (Chong *et al.*, 2009; Duke and Ehemann, 2002). Although the term disruption implies inconvenience, even when an element of disruption is lacking people may not reduce water use because they are not motivated to do so (Seligman and Finegan, 1990

cited in Syme *et al.*, 2000). People *selectively* choose (whether consciously or as a matter of habit) which water saving behaviours to engage in when it comes to matters of personal pleasure and comfort (Allon and Sofoulis, 2006). Fewer people are likely to engage in the unpleasant or sacrificial behaviours such as flushing the toilet less often or having fewer showers (Gilg and Barr, 2006), and rather, expect governments to provide more water (Troy and Randolph, 2006). Troy and Randolph (2006) warned against a simplistic analysis of the drivers of water consumption but nonetheless concluded that water use was determined by 'life course' (socio-demographic factors).

The selective choice of how water is used is apparent in the study by Syme *et al.* (2004) who found a greater willingness among some people to conserve water inside the home than in their gardens, determined by the value they placed on a healthy garden for the maintenance of property value or lifestyle. The tolerance of restrictions in Perth (mentioned earlier), was contingent on continued access to water for lifestyle-gardening (Nancarrow *et al.*, 2002). Similar results have been found in metropolitan Phoenix, USA (Yabiku *et al.*, 2008) and metropolitan Barcelona, Spain (Domene *et al.*, 2005).

8. CLOSING STATEMENT

Pumphrey *et al.* (2008) found that people living in rural areas preferred less water regulation than urbanites and advocate that for water conservation measures to be most effective, they need to be location (urban or rural) specific. Thus, for water demand management strategies (of which restrictions is one) to be effective they need to consider the 'social situation' and 'the lived experiences of those they are trying to influence' (Gilg and Barr, 2006, p. 413), for it is only where there is the motivation (and positive attitudes) towards compliance that water conserving behaviours are likely to follow. If people's desired lifestyle is at odds with restrictions, campaigns are unlikely to be effective in changing water use behaviour (Saurí *et al.*, 2003). Furthermore, the efficacy of campaigns tends to be short-lived, thus if agencies hope to achieve behavioural changes through the use of campaigns, they should not only be strategically timed and targeted at specific activities, but also need to have personal (Gregory and Di Leo, 2003; Barrett and Wallace, 2009) and locational relevance.

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