CRC for
Water Sensitive Cities

Community profiles of engagement with water

Identifying 'footholds' for building engaged communities

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Community profiles of engagement with water
Identifying 'footholds' for building engaged communities
Understanding social processes to achieve water sensitive futures (Project A2.1)
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Executive Summary

Background and rationale

The transition to water sensitive cities involves integrating investment, policy, and technological solutions to pursue water security and waterway protection (Brown and Farrelly 2009, Marlow et al. 2013, Vorosmarty et al. 2010). There is increased recognition that water management approaches need to consider not only technical and biophysical solutions to water scarcity and pollution, but also the socio-cultural context in which these solutions are implemented (Brown et al. 2009, Marks and Zadoroznyj 2005, Pahl-Wostl et al. 2013). Therefore, a critical element of transitioning to water sensitive cities is fostering an engaged citizenry – citizens that understand, value and actively support this transition, or what we term 'water sensitive citizens'.

Identifying ways that communities engage with water-related issues provides a necessary foundation to inform initiatives that seek to change behaviour or build support for new policies or investment (Marks and Zadoroznyj 2005, Marlow et al. 2013).

What was done?

National Survey

We surveyed a representative sample of Australian adults (n=5172). We assessed three elements of engagement in water-related issues:

- Cognitive engagement: water-related knowledge
- Emotional engagement: attitudes to alternative water sources, and household environmental identity
- Behavioural engagement: uptake of water-saving devices, adoption of water-saving behaviours, and adoption of pollution reduction behaviours.

The survey also assessed demographic and household characteristics, life experience and psychosocial characteristics.

Analysis Approach

Cluster analysis was conducted. This process identifies groups that emerge from the data, based on differences in engagement profiles.

Study Findings

Five groups emerged from the data that differed on their engagement profile:

1. 'Disengaged': this group exhibited low or very low scores for all engagement items.
2. 'Aware but inactive': this group exhibited high scores for water-related knowledge and support for alternative water sources, but low scores for environmental identity and all behaviours.
3. 'Active but not engaged': this was the largest of the five groups, comprising 31% of the sample. Despite reporting high scores for water-saving and pollution-reduction behaviours, this group exhibited low scores for cognitive and emotional engagement, and uptake of water-saving devices.
4. 'Engaged but cautious': this group exhibited high or very high scores for all engagement indicators except for support for alternative water, which exhibited scores in the 'low' range.
5. 'Highly engaged': this group exhibited high or very high scores on all engagement indicators.

Each group differed on their support for policy initiatives

The five groups exhibited significant differences with regard to supporting raingardens on their property or in their street, where 'Highly engaged' exhibited the greatest support for raingardens, and the 'Disengaged' exhibited lowest support for raingardens. Similarly, there were significant differences between clusters with regard to willingness to pay for waterway protection, with the highest willingness in the 'Highly engaged', and the lowest in 'Disengaged' groups.

Summary

Each group differed with regards to demographic, household and other characteristics

Each of the groups exhibited a distinct profile:

1. ‘Disengaged’: this group were more likely to be young, urban males, with low rates of education and low rates of Northwest European ancestry. They were more likely to have children, to be renting their home and less likely to have a garden. They reported lower life satisfaction, low rates of community participation, and weak social norms about water saving. This group were less likely to have experienced water restrictions, and less likely to report being exposed to water-related information.

2. ‘Aware but inactive’: this group was similar to the Disengaged group, except that respondents in this group reported higher levels of education and were more likely to report northwest European ancestry.

3. ‘Active but not engaged’: these respondents were more likely to be renting their home and to have a garden. They reported lower rates of education and were less likely to report northwest European ancestry. This group were more likely to report having experienced water restriction but reported weaker social norms.

4. ‘Engaged but cautious’: this group were more likely to be older, and report higher incomes. They were more likely to live in regional or rural areas, and own their own home. This group had higher rates of participation in community organisations, strong social norms, and reported changing behaviour in response to water restrictions.

5. ‘Highly engaged’: this group were more likely to be female, have higher income, and higher education. They were more likely to live in regional or rural areas, and report European ancestry. This group owned their own home, and reported higher life satisfaction, strong social norms and greater use of waterways. They reported changing behaviour during water restrictions and greater exposure to water-related information.

The demographic and psychosocial profiles of each group provides a foundation for targeting initiatives that aim to promote greater engagement in water-related issues. Engagement initiatives may aim to maintain or enhance engagement in those already engaged, or build engagement in disengaged groups.

Appealing to the disengaged is challenging: initiatives need to ensure relevance for young, urban renters without gardens or experience of water restrictions, and tackle potential social disadvantage, indicated by lower rates of education, homeownership, participation and satisfaction.

Background

The transition to water sensitive cities involves integrating investment, policy, and technological solutions to pursue water security and waterway protection. There is increased recognition that water management approaches need to consider not only technical and biophysical solutions to water scarcity and pollution, but also the socio-cultural context in which these solutions are implemented (Brown et al. 2009, Marks and Zadoroznyj 2005, Pahl-Wostl et al. 2013). Therefore, a critical element of transitioning to water sensitive cities is fostering an engaged citizenry – citizens that understand, value and actively support this transition, or what we term 'water sensitive citizens'. Identifying ways that communities engage with water-related issues provides a necessary foundation to inform initiatives that seek to change behaviour or build support for new policies or investment (Marks and Zadoroznyj 2005, Marlow et al. 2013).

How do we define engagement?

Drawing from the field of educational psychology (Fredricks et al. 2004), we propose a multidimensional model of water engagement that incorporates three distinct, yet inter-related, elements: cognition, emotion and behaviour. Cognitive engagement refers to knowledge about key water-related issues, and the capacity to apply this knowledge. Emotional engagement incorporates positive attitudes about water and water management, such as support for alternative water sources (James et al. 2010), and positive attitudes toward the environment more generally which could be reflected in a person's identity as a pro-environmental person (Stets and Biga 2003). Behavioural engagement reflects how involved the individual is in water sensitive behaviours, such as reducing water use, or reducing pollution. It is likely that an individual who is highly engaged in water-related issues – a water sensitive citizen - understands important water concepts and issues, supports approaches that can address water issues, and acts to address water issues (Figure 1). From a sociological perspective, this water sensitive citizen is knowledgeable about water, has pro-environmental values, and participates in water sensitive practices.

Our research approach

Although identifying how communities engage with water-related issues is considered important, 'community' rarely refers to a cohesive or homogenous unit; more typically, 'community' comprises groups of people with diverse (and sometimes competing) attitudes, beliefs, and interests (Harrington et al. 2008). Many policy approaches to water management consider households or individuals as aggregates or homogenous units (Allon and Sofoulis 2006) which masks the diverse and complex characteristics of human engagement with water, and limits effectiveness of engagement initiatives.

Cluster analysis allows us to identify more complex profiles of engagement in water-related issues, that capture differing levels of engagement across the cognitive, emotional, and behavioural dimensions. It also allows us to develop social and demographic profiles of individuals exhibiting different patterns of engagement. This approach, also called market segmentation (Maibach et al. 2009), can enable engagement initiatives to be targeted more effectively to societal subgroups of interest. Importantly, rather than 'blaming' individuals for inappropriate behaviours, this approach examines the social contexts that enable or constrain engagement (Pearce et al. 2013). Identifying both individual and contextual factors associated with environmental profiles can highlight 'footholds' for intervention, where initiatives can be more effectively targeted to specific social groups and social settings.

The current study identifies profiles of community members, based on their diverse modes of engagement in water-related issues, using a representative sample of Australian adults. Our engagement framework encompasses cognitive, emotional and behavioural elements of sustainable urban water management. We aim to explore the following questions using an inductive cluster analysis approach: (i) Can water-related cognition, emotions, and behaviours reliably differentiate water users into specific groups? (ii) How do these groups differ with regard to demographic, household and psychosocial characteristics; and (iii) Do these groupings predict support for two policy initiatives: support for raingardens and willingness to pay for waterway protection?

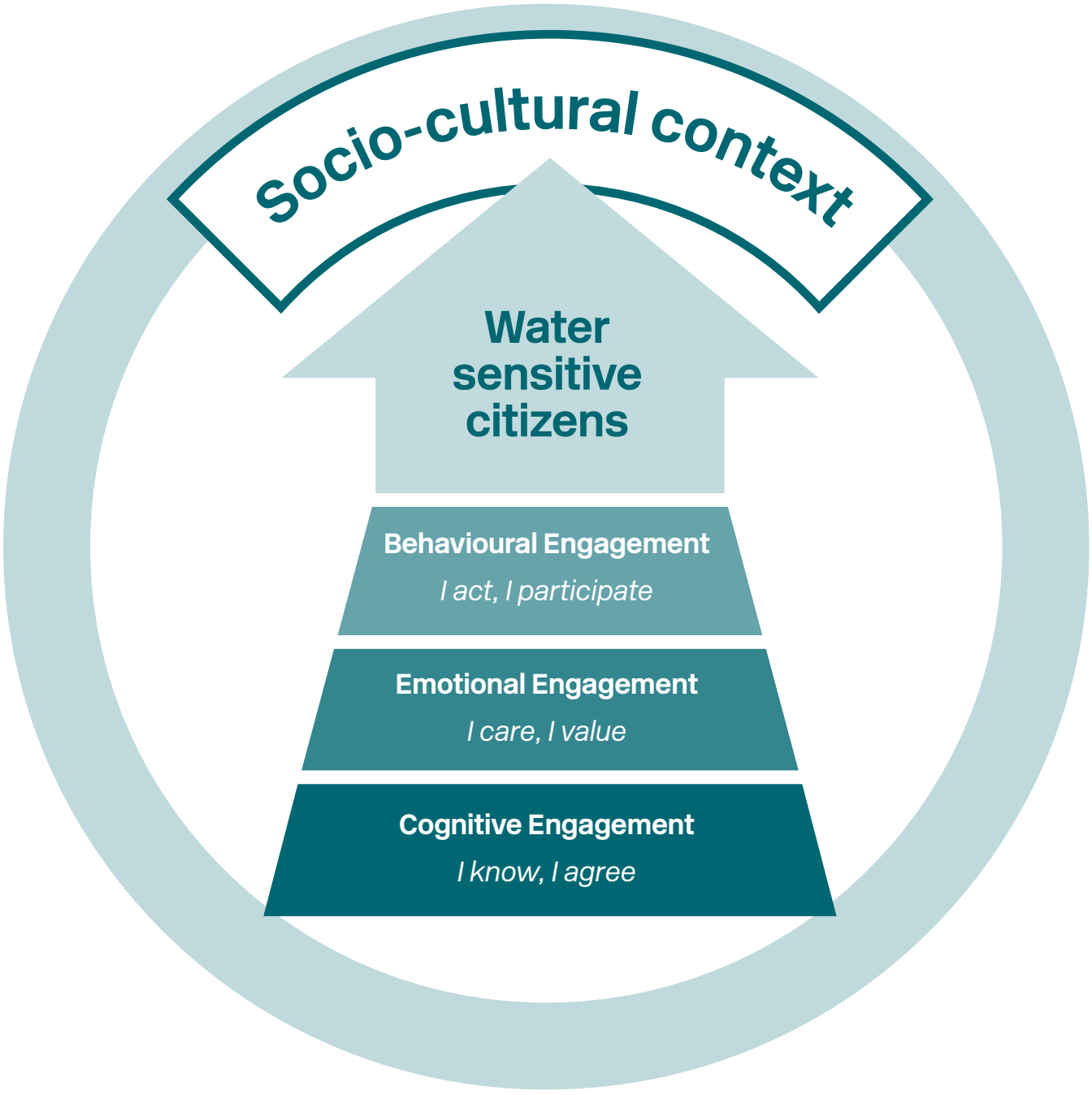


Figure 1. Framework for assessing engagement in water-related issues

What we did: national survey

Who was surveyed?

A total of 5194 adults living in Australia completed an online survey during February-March 2014. The sample was representative of the Australian population, based on gender, age, education and state of residence (Dean et al. 2016). The average age of the sample was 47 years, and half were female (50.9%). The majority of respondents lived in urban centres (69.8%), had qualifications beyond high school (69.1%), and were employed at the time of the survey (54.0%). The most frequently cited ancestry was northwest European (55.5%). Almost half of the sample had at least one parent born overseas (47.7%) and 18.7% spoke a language other than English when at home. The majority of respondents reported having lived through water restrictions (81.7%).

How was engagement measured?

Cognitive engagement

- Water-related knowledge: fifteen questions asked about catchments, water treatment and management, and the influence of household activities on water quality. For each respondent, a water knowledge score was calculated based on the number of correct responses (Range 0-15).

Emotional engagement

- *Support for alternative water sources:* six questions assessed support for use of recycled water, stormwater, or desalinated water for drinking and non-drinking purposes.
- *Household environmental identity:* five questions assess whether participants viewed their household as environmentally sustainable.

Behavioural engagement

- Uptake of water saving devices: the number of water-saving devices installed in their home.
- Everyday water-saving strategies: use of everyday water-saving strategies in the home (e.g. fixing leaks quickly, taking shorter showers).
- Pollution-reduction behaviours: engagement in everyday pollution reduction behaviours (e.g. preventing animal waste from entering waterways, putting rubbish in the bin, reporting pollution incidents).

Characteristics of survey respondents

Respondents were asked about the following issues:

- *Demographics:* age, sex, education, household income, and current employment status. Postcode was used to classify distance from urban centre (major cities, inner regional, outer regional, remote, very remote) (ABS 2002).
- *Cultural background:* Aboriginal or Torres Strait Islander heritage, time lived in Australia, ancestry, and whether languages other than English were spoken at home.
- *Household characteristics:* number of people living in household, number of children in household, time living at current address, whether their home was rented or owned, and the size of their garden.
- *Information sources:* sources of water-related information received (if any) in the last 6 months.
- *Experience:* whether they had experienced water restrictions, and changed their behaviour during restrictions.
- *Waterway use:* whether they were regular users of waterways for fishing, boating or swimming.
- *Life satisfaction:* satisfaction with ten different aspects of life.
- *Participation:* the number of community organisations in which they were active.
- *Social norms about water use:* whether respondents thought that others in their community saved water, and perceptions about whether others in their community wanted them to save water.

Online survey - representative sample of 5914 Australian adults

Indicators of engagement

Cognitive

- Water-related knowledge

Emotional

- Support for alternative water sources
- Environmental identity

Behavioural

- Water saving behaviours
- Uptake of water saving devices
- Pollution reduction behaviours

Emotional

- Demographics
- Household characteristics
- Life experience & psychosocial characteristics

Patterns of engagement

Cluster analysis was conducted to identify different profiles of engagement. This is an inductive process, where the groups were identified from the data rather than a pre-determined classification. The following five groups emerged (Dean et al. 2016):

1. '*Disengaged':* this group exhibited low or very low scores for all engagement items.

2. '*Aware but inactive':* this group exhibited high scores for water-related knowledge and support for alternative water sources, but low scores for environmental identity and all behaviours.

3. '*Active but not engaged':* this was the largest of the five groups, comprising 31% of the sample. Despite reporting high scores for water-saving and pollution-reduction behaviours, this group exhibited low scores for cognitive and emotional engagement, and uptake of water-saving devices.

4. '*Engaged but cautious':* this group exhibited high or very high scores for all engagement indicators except for support for alternative water, which exhibited scores in the 'low' range.

5. '*Highly engaged':* this group exhibited high or very high scores on all engagement indicators.

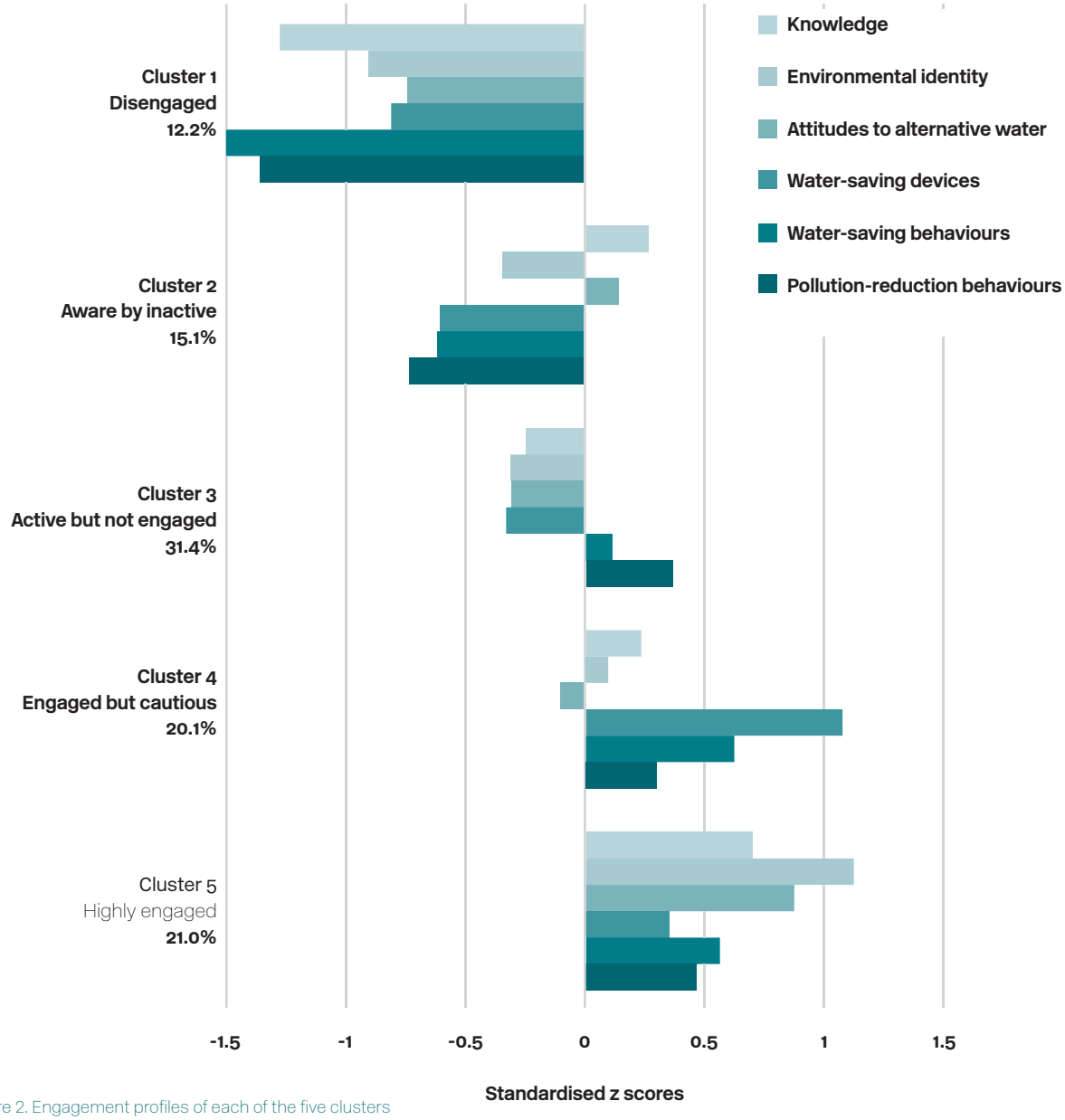


Figure 2. Engagement profiles of each of the five clusters

Did these groups differ on their support for policy initiatives?

We assessed whether these groupings were able to predict support for two policy initiatives: support for raingardens and willingness to pay for waterway protection. The five groups exhibited significant differences with regard to supporting raingardens on their property or in their street, where 'Highly engaged' exhibited the greatest support for raingardens, and the 'Disengaged' exhibited lowest support for raingardens. Similarly, there were significant differences between clusters with regard to willingness to pay for waterway protection, with the highest willingness in the 'Highly engaged', and the lowest in 'Disengaged' groups

What proportion of residents in each state are members of each group?

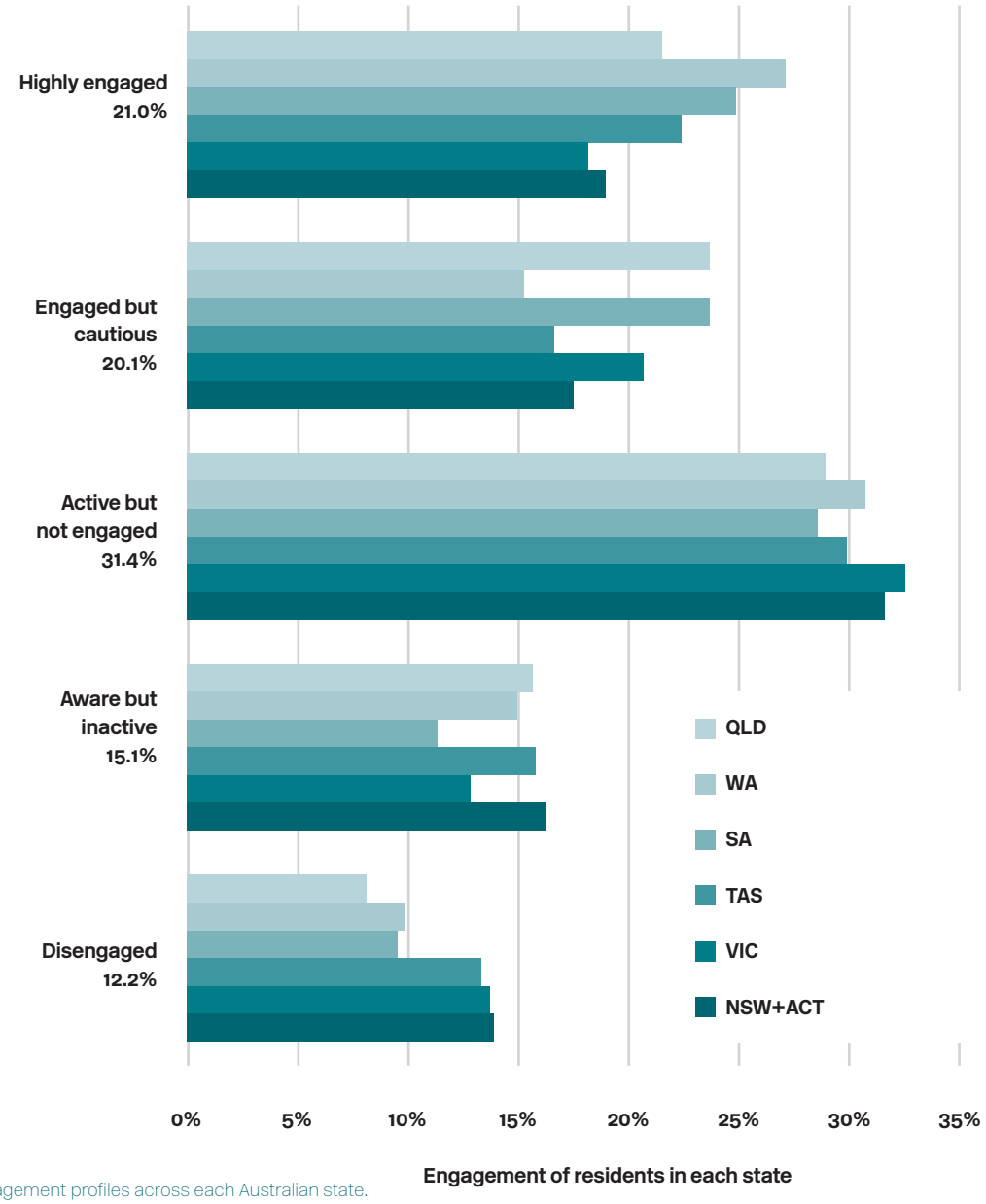


Figure 3. Engagement profiles across each Australian state.
Note: NT residents were excluded from the figure due to small sample size

Characteristics of the ‘Disengaged’ group

Multivariate analysis indicated that, compared to the rest of respondents, ‘Disengaged’ respondents exhibited the following characteristics:

- younger age
- more likely to be male
- less likely to have received a university degree
- more likely to reside in urban areas
- less likely to report northwest European ancestry
- lower incomes
- more likely to have children
- more likely to be renting their home
- less likely to have a garden
- lower life satisfaction
- lower rates of participation in community groups
- less likely to have experienced water restrictions, and three times less likely to have changed water use behaviour during water restrictions
- weak social norms: less likely to perceive that people around them save water or want them to save water
- less likely to report receiving water-related information in the previous six months.

Implications for practice

The ‘Disengaged’ group displayed many characteristics that could constrain water-related engagement. Lower income, children in the household, and low life satisfaction all suggest that the attention of these individuals may be focused on managing the everyday routines and challenges of social disadvantage. Low rates of home ownership and gardens limit opportunities to promote uptake of garden practices or installation of water-efficient devices; low rates of participation further limit opportunities for social learning. However, the low exposure to information in this group provides an opportunity to target issue awareness. Information is more likely to be transmitted and retained if it is relevant (de Vries et al. 2014), reinforcing the importance of ensuring information initiatives are relevant and accessible for young, male, urban renters with families. Targeting this group during newly-implemented water restrictions could provide a social context to build new water practices. While promoting installation of water-saving devices to landlords may reduce water use in this group (Randolph and Troy 2008), active engagement may be achieved by community development approaches that build social capital and support community members working together (Miller and Buys 2008).

Young men with a family

Urban residents without gardens

Renting

Lower education and income

Low community participation and satisfaction

Less experience of water restrictions

Limited exposure to information

Characteristics of the ‘Aware but inactive’ group

Compared to the rest of the group, ‘Aware but inactive’ respondents exhibited the following characteristics:

- younger age
- more likely to be male
- more likely to have received a university degree
- more likely to reside in urban areas
- more likely to report northwest European ancestry
- lower incomes
- more likely to be renting their home
- less likely to have a garden lower rates of waterway use
- less likely to have experienced water restrictions, and less likely to have changed water use behaviour during water restrictions
- weak social norms: less likely to perceive that people around them save water.

Implications for practice

Despite many similarities with the ‘Disengaged’, the ‘Aware but Inactive’ group represents a key group of interest for targeting engagement initiatives. This group exhibited above average water-related knowledge and support for alternative water, but limited uptake of water-related behaviors. Like the ‘Disengaged’ respondents, this group is more likely to contain young, male, urban renters without gardens; unlike the ‘Disengaged’ group, poor knowledge is not the key barrier to engagement. Promoting installation of water-saving devices to landlords may reduce water use in this group. Engagement initiatives for this educated group should promote adoption of everyday indoor behaviors rather than garden-related or installation behaviors, and consider using these initiatives to cultivate identity and social norms related to water use.

Young men

Urban residents without gardens

Renting

Greater education

Low waterway use

Less experience of water restrictions

Characteristics of the 'Active but not engaged' group

Compared to the rest of the group, 'Active but not engaged' respondents exhibited the following characteristics:

- more likely to be female
- less likely to have a diploma/trade qualification or a university degree
- less likely to report a north-west European ancestry
- more likely to be currently renting
- more likely to have a garden
- greater experience of water restrictions
- weak social norms: less likely to report that people around them want them to save water.

Implications for practice

The profile of those 'Active but not engaged' provides a reminder that individuals may engage in pro-environmental behaviors for diverse reasons. Within this group, it is likely that the higher presence of gardens motivates individuals to save water to enable ongoing water use in the garden. Alternatively, this group may be motivated by saving money rather than a broader environmental identity (Frederiks et al. 2015). It is possible that this group contains individuals who have adopted certain behaviors, but remain skeptical about their effectiveness or value. Engagement interventions for this group could reinforce the effectiveness of everyday behaviors, while cultivating environmental identity and social norms. The high proportion of renters reinforces the importance of campaigns promoting installation of water-saving devices in rental accommodation.

Women

Renters

Homes with gardens

Greater education

Greater experience of water restrictions

Characteristics of the ‘Engaged but cautious’ group

Compared to the rest of the group, ‘Engaged but cautious’ respondents exhibited the following characteristics:

- older age
- higher income
- more likely to live in regional or rural areas
- stronger housing stability with high home ownership and greater time living at their current address
- greater number of people in household
- have a garden
- higher rates of participation in community organisations
- more likely to report having changed their behaviour in response to water restrictions
- strong social norms: more likely to report that people around them both save water and want them to save water.

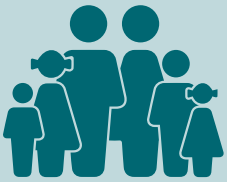
Implications for practice

‘Engaged but cautious’ respondents demonstrate that individuals with strong knowledge, environmental identity and active behaviors may still exhibit concerns about alternative water sources. Concerns about alternative water sources may be diverse, including issues related to cost efficiency or energy use, in addition to safety concerns (Dolnicar and Schafer 2009). Compared to the most engaged group, this group also exhibited lower support for raingardens and willingness to pay for waterway protection highlighting the necessity that policy makers cultivate policy support from more engaged, as well as less-engaged, individuals. In addition to building policy support, engagement initiatives for this group can build on strong environmental identity, and strong perceptions of social norms. High participation rates indicate the potential for information sharing via social networks.

Older age

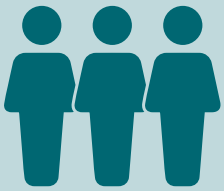
Home owners living in regional or rural areas

Large households



Higher income

Higher community participation



Greater experience of water restrictions

Characteristics of the 'Highly engaged'

Compared to the rest of the group, 'Highly engaged' respondents exhibited the following characteristics:

- older age
- more likely to be female
- higher rates of education and income
- more likely to live in regional or rural areas
- higher rates of European ancestry, and less likely to speak languages other than English at home
- higher rates of home ownership
- have a garden
- higher rates of life satisfaction
- greater use of waterways
- more likely to report having changed their behaviour in response to water restrictions
- strong social norms: more likely to report that people around them both save water and want them to save water
- more likely to report having noticed or received recent information about water.

Implications for practice

This group represents the most engaged individuals. Although some commentators suggest that there is no need for describing such groups (Sutterlin et al. 2011), we contend that characterising highly-engaged individuals is necessary for a number of reasons. For interventions promoting uptake of new behaviors or technologies, highly engaged individuals are most likely to be 'early adopters' of new behaviors. So, targeting engaged individuals to adopt innovations is an important contribution to broader social change (Nygren et al. 2015). Engaged individuals can promote social learning and diffusion of practices via informal social networks (Martini et al. 2014). Finally, despite high engagement, these individuals still exhibit scope for increased policy support, with only half indicating support for raingardens on their property or willingness to pay for waterway protection. Like the 'Engaged but cautious' group, engagement initiatives for this group can promote innovative behaviors, maintain existing behaviors, and foster policy support, while building on strong environmental identity, and strong perceptions of social norms.

Older women

Home owners living in regional or rural areas

Greater education

Strong life satisfaction

Higher rates of waterway use

Greater experience of water restrictions

Greater exposure to information

Summary

Our findings demonstrate that water-related cognition, emotions and behaviour are not always consistently aligned within the population. Understanding this inconsistency identifies opportunities for targeting interventions to enhance water engagement for different groups. At each end of the engagement continuum, there is consistency in cognition, emotions and behaviour. For example, the 'Disengaged' cluster exhibited the lowest levels of knowledge, low support for water or environmental issues as important, and limited action to conserve water or reduce pollution. At the other end of the continuum, the 'Highly engaged' had the highest levels of knowledge and the strongest household environmental identity, and make efforts to conserve water and reduce pollution in their households. Yet it is the groups in the middle that are, arguably, of greater interest. The 'Engaged but cautious' group have reservations about alternative water sources, suggesting they would need more information or re-assurance to support alternative wa ter use. In contrast, the 'Active but not engaged' cluster are active in saving water and reducing pollution but have low levels of knowledge and adoption of water-saving devices. The 'Aware but inactive' cluster are intriguing as they appear to know but don't care; their levels of knowledge are high as is their support for alternative water sources, but they have a low environmental identity and do little to conserve water.

Our findings also highlight important contextual factors that may influence or constrain water-related engagement. For example:

a) **Rental accommodation:** status of home ownership was an important influence on all five groups. Individuals renting their home often do not receive water bills or information about their water use (Randolph and Troy 2008). Renters have less capacity to modify their homes by installing water-saving appliances and less capacity to ensure that devices suit their household needs (Frederiks et al. 2015, Randolph and Troy 2008). Home ownership may also provide individuals with a sense of personal control and security (Barr et al. 2005), allowing individuals to engage with 'supplementary' issues such as water or environmental conservation. Home ownership may also enhance the relevance of water-related information.

b) **Urban residents:** Less engaged individuals were more likely to reside in urban areas, highlighting the potential for engagement initiatives to be readily targeted and implemented across specific spatial areas. Interestingly, this finding contrasts with previous research, which reports greater uptake of environmental behaviours in urban populations (Chen et al. 2011). There are diverse pathways linking non-urban living with greater water engagement. It has been argued that urban living distances people both spatially and psychologically from the land, which may limit awareness of water-related issues in urban residents (Rees 1997). Another key urban-rural difference relates to whether water is sourced from reticulated systems or independent water supplies (Dovers 2008). Reliance on independent water supplies generates the need to be well-informed about water management systems, greater awareness that water is a limited resource, and greater need for water-saving behaviours. Conversely, urban dependence on reticulated systems may promote the illusion of unlimited supply (Allon and Sofoulis 2006).

c) **Experience of water restrictions** was associated with membership of all five groups, where the most engaged clusters were more likely to report having experienced restrictions. Experiencing drought or water shortages can promote awareness of water scarcity, and adoption of water-saving behaviour (Graymore and Wallis 2010, Head and Muir 2007). Droughts may also shift how water is viewed, from a resource delivered via a technical system, to something that is part of nature (Graymore and Wallis 2010). Successful implementation of water restrictions, along with the accompanying information and feedback, may provide a context for introducing new water practices, building water-saving identity, and self-efficacy, which may persist beyond the duration of the restrictions.

d) **Inequality:** Disengaged groups were more likely to exhibit a range of characteristics suggesting poor 'social capital' - social connectedness that enables people to work together for mutual benefit (Miller and Buys 2008). These factors include lower rates of participation in community groups, poor life satisfaction and weak social norms. Community groups provide networks for social learning, sharing information about water practices, and activating social norms surrounding water (Miller and Buys 2008). The influence of social norms on environmental behaviours is well-established (Steg et al. 2014); it is possible norms are more effectively activated in those with greater social capital. Similarly, individuals with poor life satisfaction may experience a range of stressors, limiting cognitive capacity for engagement in other issues (Shah et al. 2012). These factors, alongside other contributors to poor engagement such as income, education and homeownership, indicate that social inequality may impact on capacity to engage with water-related issues. This may, in turn, limit the capacity for disengaged groups to use water to optimise the liveability of their home environment, and may also contribute to poorer social or health outcomes.

Where to next?

The demographic and psychosocial profiles of each of these groups provide a foundation for targeting initiatives that aim to promote greater engagement in water-related issues. Engagement initiatives may aim to maintain or enhance engagement in those already engaged, or build engagement in disengaged groups. Engaging the disengaged is challenging: initiatives need to ensure relevance for young, urban renters without gardens or experience of water restrictions, and tackle potential social disadvantage, indicated by lower rates of education, homeownership, participation and satisfaction. This will ensure that the transition to water sensitive cities is effective and equitable. Future research will examine interventions and approaches to promote engagement across diverse social groups.

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