How perceived distance and lived experience influences water-related threat perceptions: a case study

Peer reviewed

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SUBMITTED
15 July 2024

ACCEPTED
8 October 2024

CITATION
Pardon M K, Swinbourne A and McShane C J (2025) 'How perceived distance and lived experience influences water-related threat perceptions: a case study'. *Australian Journal of Emergency Management*, 40(3):29–39.

DOI
www.doi.org/10.47389/40.3.29

Introduction

Australia's fresh water supplies are vulnerable (Gleick 2012; Gregory and Hall 2011; Ray Biswas et al. 2023). This vulnerability is intensified by climate change, which has already had major implications for freshwater resources, water management and overall water quality (Beeson 2020; Gleick 2012; Pearce et al. 2013; Ray Biswas et al. 2023). Population growth and increased agricultural and industrial activities also add pressure to already strained water supplies (Gregory and Hall 2011; Sullivan 2020). As a result, there is a greater demand for water but a shrinking supply for the nation.

With climatic events having direct and indirect impacts on the way Australians live and as such events show no signs of reprieve (Bureau of Meteorology 2018; Steffen et al. 2018), there has been a substantial effort to increase water security, particularly freshwater supplies, within the country. These strategies include implementing supply limits, technological advancements in the home, access to water infrastructure, changes in water distribution structure and a significant focus on reducing demand for water (Beeson 2020; CSIRO 2011). Several methods are already in place to reduce residential water usage and water-saving campaigns are among the most common techniques to promote household water conservation (Koop et al. 2019). However, whether these methods effectively encourage desired behaviour and safeguard water supply, in addition to the other common practices (e.g. water restrictions and entitlements) is questionable. This concern is particularly critical for people who do not perceive that they have experienced water insecurity, despite Australia's frequent exposure to extreme weather events.

Abstract

Across the globe, countries grapple with strains on resources and the effects of climate change on the ways populations live. Australia's fresh water supplies are vulnerable and the nation will continue to experience water security issues. Thus, understanding the perceptions of people to the water security threat will assist in developing effective mitigation strategies. To identify these perceptions, a case study of residents in the coastal city of Townsville in north Queensland, Australia, was undertaken. A total of 299 participants were recruited who completed an online survey that, in line with construal level theory, presented water scenarios as proximal and distal in terms of spatial, temporal, hypothetical and social distances. Results were that distal threats and previous exposure to water-security threats elicited higher individual threat perceptions. This research offers considerations for future water security mitigation strategies that encourage water-saving behaviour, particularly in this region.

The conflict between an individual's exposure to and perception of an event is a problem for implementing mitigation strategies that rely on prior knowledge. To effectively engage someone in the appropriate mitigation behaviour, messages need to be relayed to an audience before the event occurs. It is also challenging to create communication that aims to change current behaviour in order to prevent future negative outcomes—people are less likely to behave under such circumstances (Lorenzoni and Pidgeon 2006). There is evidence that threat perceptions are likely facilitators of behaviour in the environmental context (e.g. Kim et al. 2013; O'Neill and Nicholson-Cole 2009; Pardon et al. 2019). Therefore, exploring people's lived experience and 'distance' via the mechanism of threat may provide valuable information to inform behaviour-change strategies.

Research by Dolnicar and Hurlimann (2009) explored the influence that experience has on pro-environmental behaviour. For example, individual perceptions of water appear dependent on experience and water supply context in a study. Participants of that study were located in Adelaide, South Australia, and Brisbane, Queensland. Both locations had ongoing water security issues and participants were the most open to drinking recycled water (Dolnicar and Hurlimann 2009). In contrast, participants in Darwin, Northern Territory, indicated they had never been subjected to water restrictions and that they did not like the idea of drinking recycled water or that it was 'disgusting' to drink water from alternative sources (Dolnicar and Hurlimann 2009).

A study by Milfont et al. (2014) examined the relationship between coastline proximity and belief in climate change and support for a carbon emission policy in New Zealand. The study suggested that participants who lived closer to coastal regions may be more likely to experience weather-related events, consider future events and pay more attention to warnings about weather (Milfont et al. 2014). Results found that proximity to the coast was positively associated with an increased belief in climate change and support for the regulation of carbon emissions. Thus, such individuals would be more likely to engage in associated action, for example, preparedness or mitigation behaviour. These findings are supported by research conducted by Spence, Poortinga, Butler et al. (2011) as well as Haney (2021). These authors found that participants who had direct experience of flooding were more concerned and less uncertain about climate change and felt more confident that their actions would mitigate such a threat. Similarly, Haney (2021) found that experience with a natural hazard led to a greater belief in climate change and preparation for events and this spilled over into higher performance on household pro-environmental behaviours (e.g. recycling). Exposure to previous events or water insecurity influenced the behaviour, intentions and beliefs of participants. However, such research possibly overlooks segments of the population that are exposed to water-security threats and who may not perceive them as water-security issues.

Construal level theory

Convincing individuals to engage in preventative behaviour, particularly when that behaviour attempts to ease the effects of an environmental threat that may occur in the future, is a challenge. People tend to find environmental hazards difficult to grasp given these events can be, at times, invisible, occur gradually and are uncertain (Gifford 2011). Psychological distance is the extent to which an event, object or idea is present in an individual's direct experience (Liberman et al. 2007). For example, the predicted effects of climate change could be argued to be a psychologically distant event to an individual. The immediate effects are hard to detect, the scale is global and the eventual outcomes are uncertain. In other words, climate change is not present in an individual's direct experience. Exploring the effect of psychological distance on threat perceptions may assist in understanding how distance may influence an individual's threat perceptions about water security.

Construal level theory (CLT) (Liberman and Trope 1998; Trope and Liberman 2003; 2010) was used to examine how psychological distance facilitates the threat perception of people. CLT proposes 4 types of psychological distance that can alter an individual's perception: temporal, spatial, social and hypothetical. CLT describes the relationship between psychological distance and the extent to which an individual's thinking is abstract or concrete. The theory's hypothesis is that the more psychological distance increases, the more abstract one's thinking (Trope and Liberman 2010). Close events encourage a person to act due to the increased ability to focus on situational cues. This is because these events have little ambiguity and uncertainty and individuals can focus on the specific consequences of their actions (Liberman and Trope 2008). In contrast, distant events may be perceived as more uncertain. Evidence suggests that this distance or events being perceived as abstract helps people make decisions that align with their core values and beliefs (Liberman and Trope 2008). Table 1 shows how each component of psychological distance is conceptualised in the current research.

Limited evidence has used CLT and the concept of psychological distance in contexts with a high degree of uncertainty, for example, environmental events. In this context, particularly water security, situations may be perceived as uncontrollable and have uncertain consequences (Lorenzoni et al. 2007). Encouraging

Table 1: Operationalisation of construal level theory psychological distances.

Distance	Operationalisation example
Temporal (time)	Future vs. Past Near future vs. Far future
Spatial (physical space)	Near vs. Far Here vs. Over there
Social (interpersonal distance)	Self vs. Other Similar vs. Dissimilar Familiar vs. Unfamiliar
Hypothetical (likelihood)	Real vs. Hypothetical Likely vs. Unlikely

individuals to view future environmental events as concerning (i.e. having an abstract mindsight) while currently acting to reduce or mitigate such events from occurring in the future (i.e. specific goals) would be the ideal relationship between perception and behaviour in this context.

Research has attempted to explore the effects of manipulating psychological distance on the performance or intention of people to perform pro-environmental behaviours. For example, the relationship between psychological distance and behaviour was investigated by Spence, Poortinga and Pidgeon (2011) who explored and characterised the CLT psychological distances (temporal, social, spatial and hypothetical) concerning climate change. Researchers argued that many people perceive climate change as psychologically distant on all CLT dimensions and this could be the reason for declining concern and increasing uncertainty and scepticism (Spence, Poortinga and Pidgeon 2011). These researchers also aimed to determine if reducing the psychological distance of climate change risk helps promote sustainability behaviour, given the unpredictable and uncertain nature of such events. Participants completed an interview-style survey that asked about cognitive constructs relating to energy and climate change, behavioural intentions, perceptions of climate change and psychological distance dimensions. Results indicated that lower psychological distance, specifically personal and local considerations of climate change, was related to greater concern about climate change. However, in terms of action, the broader global effects of climate change (i.e. greater psychological distance) were more likely to encourage intentions to behave sustainably. The implications of climate change on distant locations may have assisted individuals within the sample considering their preparedness behaviour in response to future threats. However, it did not influence their concern regarding the effects of climate change on their own environment. These findings support that of Kortenkamp and Moore (2006) who suggested that individuals had a greater willingness to cooperate when uncertainty was low, suggesting the effect a temporal influence has on one's desire to cooperate. This finding highlights the influence delayed effects have on decision-making: the more immediate the consequences are, the more likely one will reduce resource consumption (Kortenkamp and Moore 2006).

Taken together, these findings highlight an important consideration for using CLT psychological distances in the environmental context when predicting behaviour. It suggests that close psychological distance would enable more action to occur, given the certainty of environmental events and their consequences. It should be noted that these studies were based on the large and broad issue of climate change and general environmental events. It would be useful to examine whether the findings were consistent with environmental threats of a small, localised nature, which is the focus on this study. This is supported by research from van der Linden et al. (2015) who suggested that communications should be presented as local, proximal problems with personal risks to facilitate public engagement. This is supported by Scannell and Gifford (2013) who indicated that participants were more receptive to localised messages and information compared to distant or global information.

Specific to the water security context and examining the interplay between global issues and localised events, Deng et al. (2017) investigated the mechanisms that increase an individual's adaptive behaviour. Researchers applied CLT to the context of water security with participants who lived in a drought-prone area. Results found concrete perception of saving water (i.e. the event is perceived as proximal) plays a significant role in engaging in specific adaptive water-saving behaviours compared to an abstract perception of climate change (i.e. an event that is distal). While the study established an important connection between localised disasters and climate change, there were central points to consider for the current study. First, the sample comprised of high school students, thus limiting the generalisability of the study's findings. Additionally, the study by Deng et al. (2017) did not explicitly examine the individual components of CLT (i.e. the social, temporal, hypothetical and spatial psychological distances), thus arguably not investigating the true utility of the theory in the water-security context. While it is promising that CLT has been applied in the water-security context, these considerations are of key interest to the current study, which also applies CLT to a localised water-related event.

The psychological distance of an event could be argued to affect an individual's threat perception and, as a result, influence mitigation behaviour. In this instance, the proximity of an event or exposure to previous events are also likely behavioural facilitators. Furthermore, examining more localised events, rather than a generalised discussion

of environmental events, may provide evidence for using CLT in this context. Communities that have experienced significant water security events, such as Townsville, allow for such investigations between lived experience, threat perceptions and behaviour to occur.

Case study area: Townsville

Townsville is a city on the north-east coast of Queensland, Australia and is in a climatically classified 'dry tropics' region with a population of 234,283 (Australian Bureau of Statistics 2021). The region's main water supply is the Ross River Dam, which was constructed in 1970 originally for flood mitigation and water storage (Townsville City Council 2020). The Townsville City Council supplies potable and non-potable water to properties within the Townsville local government area, with residents charged for their consumption based on a rate per kilolitre of usage.

Before the current study, the Townsville region had been subject to a water-security threat (drought) for almost 3 years, from November 2015 until May 2018. The area had not previously been drought declared since 2003. On 25 August 2015, the dam level fell below 40% and the Townsville community was first exposed to Level 1 water restrictions. At the height of the drought, the city experienced Level 3 water restrictions, which were enforced in August 2016. Failure to comply with these restrictions led to financial penalties for community members.

Townsville City Council Level 3 water restrictions:

- No sprinkler and irrigation systems.
- Handheld watering (only 6am–7am and 6pm–7pm) on an odds and evens watering system.
- Buckets, watering cans and drip irrigation systems can be used at any time.
- Switch off all automatic watering systems.
- Use of a broom to clean hard surfaces (not a hose).
- Use of a bucket of water-efficient car wash to clean vehicles and boats.

In February 2018, a rainfall event occurred in the Townsville region during the drought period. Within a number of days, the Ross River Dam exceeded capacity. In March 2018, Townsville's water restrictions eased to modified Level 2 restrictions, which allowed residents to use sprinklers for lawn watering between 5pm-8am, 3 days per week and handheld hose watering at any time.

Figure 1 shows the historic dam levels for the Ross River Dam from 2017 to 2019, being the levels from the drought to the flood period.

Townsville was selected as the research site for this case study due to the community having just experienced 2 major water-related events, both in terms of insufficient water (drought) and too much water (flood). This made the population of interest unique regarding water-related threats. Also, there is minimal empirical research regarding effective communication in the water-security context to increase water conservation behaviour in at-risk communities or towns that considers previous exposure, perception of threat and also the unpredictable nature of environmental risk. Therefore, this research explored the complicated nature of individual threat perceptions of water to provide recommendations for risk messages in the water-security context. Through the manipulation of water-related communications (one presenting a proximal event and the other a distal event), 2 hypotheses were examined:

1. There would be a difference in the threat perceptions of individuals after exposure to proximal and distal scenarios, with proximal scenarios predicted to elicit higher threat perceptions, in line with the previous research.
2. Those who perceived they had experienced a water security threat within the Townsville region would report higher threat perceptions after each scenario presentation compared to those who did not.

Method

A pre-post experimental study design was conducted that examined threat perceptions of participants at baseline (pre-exposure to scenarios) and after exposure to 2 scenarios. Ethical approval was obtained through the James Cook University Human Research Ethics Committee (approval number H7675).

Participants

The survey recruited participants from Australia. However, for this study, only participant responses from the Townsville region were kept for analysis. The final sample consisted of 299 participants (205 females, 93 males and one individual not indicating a gender). Participants were from Townsville, ranging in age from 17 to 65 years (M=25.12, SD=10.61). Most participants (n=241) indicated they did not own a home and that they had experienced a water security issue (for example, their town had been drought declared) (n=233).

Materials

All participants completed an online questionnaire containing 41 questions, which took approximately 20 minutes to complete. In addition to the questionnaire, participants were presented with 2 vignettes describing a water-related scenario. Scenario 1 described a situation

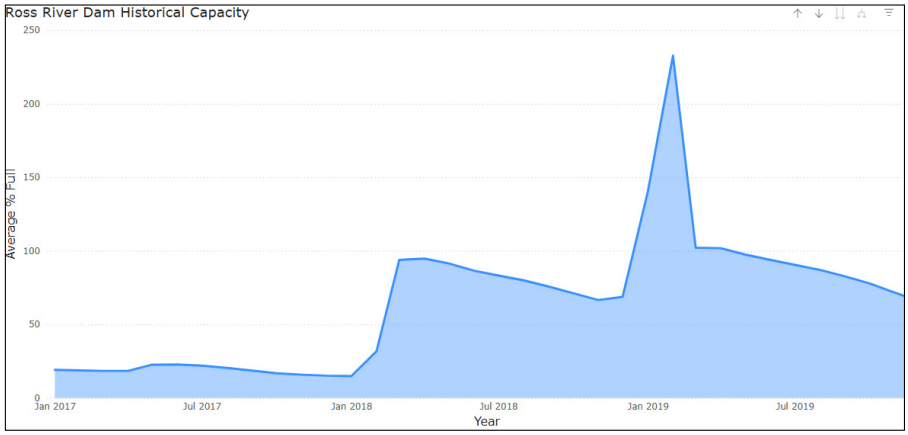

Figure 1: Ross River Dam levels (percentage) from 2017–19.

Source: Townsville City Council website www.townsville.qld.gov.au/water-waste-and-environment/water-supply-and-dams/dam-levels.

Note: Current study data collection occurred between April 2019 and September 2019.

where participants were instructed to imagine the scenario applied to their town or city (which they were required to name earlier in the questionnaire). As all non-Townsville respondents were removed from the analysis for the purpose of this study, the city or town presented in the proximal scenario was always Townsville. This was to mimic a 'close' event in terms of hypothetical, temporal, social and spatial distance and as guided by the CLT (Trope and Liberman 2010). For Scenario 2, the description was much broader. It was about Australia in general, to mimic a 'far' event in terms of hypothetical, temporal, social and spatial distance. Table 2 summarises each scenario description.

Measures

The questionnaire used was part of a larger study and only variables pertaining to the current work are presented:

- demographic information - including gender, age and home ownership
- previous water-security experience - was assessed by one measure: 'Have you ever experienced water security issues (e.g. has a town you have lived in/are currently living in, been drought declared, was the local dam at a low capacity, etc.)?', with forced choice options: Yes or No.

Threat severity and susceptibility

Threat severity was defined as the perception of how much harm the event/stimulus can cause to the individual (Witte 1992). Threat susceptibility is defined as perception of how close the event is in terms of proximity to the individual (Witte 1992).

These measures were adapted from the Risk Behaviour Diagnosis Scale (Witte et al. 1996). Participants were asked to indicate how much they thought the negative effects of water security described in the scenarios would negatively impact and were likely to affect themselves, their friends and family, people in their current city/town, their

Table 2: Scenario descriptions.

CLT factor	Proximal scenario	Distal scenario
Spatial	Townsville is experiencing a major water security issue.	Currently Australia is experiencing a major water security issue.
Social	Townsville is the only community experiencing water insecurity to this degree in Australia.	Australia is not the only country experiencing water insecurity in the world.
Temporal	Townsville has not experienced substantial rain in over 4 years.	Australia, overall, has not experienced substantial rain in over 12 months.
Hypothetical	It is predicted that Townsville will remain on water restrictions for a substantial period.	It is predicted that Australia will experience many negative effects as a result of this water security issue (for example, mass soil erosion).

Note: For the temporal distance statement, the timeframes chosen (4 years and 12 months) were relative to the area (i.e. Townsville and Australia). It would be unlikely that the whole of Australia would not experience rain for over 4 years. This timeframe (4 years) would be more likely for a small geographical area like Townsville. Additionally, Townsville had recently experienced a drought that spanned over 4 years (from 2015 until 2019) before the data collection for this study, again emphasising the likelihood of this occurring in the region.

current city/town (economically/environmentally), people nationally within Australia and Australia (economically/environmentally). The 6 items for each measure were rated on a 7-point Likert Scale (1=no negative effect/not likely at all to 7=extreme negative effect/extremely likely) and higher scores indicated higher threat severity and susceptibility perceptions, respectively. Question scores were averaged to give each individual one threat severity and one threat susceptibility score between 1 and 7, as per the original response scales. For both scenarios, the same set of 6 questions for each measure was repeated, giving each participant a pre-exposure threat severity and threat susceptibility score and 2 post-scenario threat severity and threat susceptibility scores. All threat severity and susceptibility measures had a Cronbach alpha value of .80 or above.

Procedure

Recruitment sites included online social media networks (Twitter and Facebook) and university and community networks via local radio stations. Participants were provided with a URL for the survey. Participants completed the survey via the Qualtrics online platform. All statistical analysis were performed in the SPSS version 27 computer program.

The study followed an experimental design. First, all participants completed demographic and previous experience questions as well as threat severity and susceptibility measures. Participants were then randomly allocated to read one of 2 scenarios (proximal or distal scenario) with participants viewing both by the end of the experiment. The scenario presentation was counterbalanced to avoid confounding variables. For both scenarios, participants were asked to imagine they were experiencing the situation described. After each scenario viewing, participants were again asked to complete threat severity and susceptibility measures.

Results

Table 3 shows the mean (SD) scores for all threat measures. Repeated-measure ANOVAs were conducted between the 3 condition scores on all threat variables to assess if scenario presentation altered threat and efficacy perceptions. First, the relevant assumptions were assessed. The dependent variables were measured on a continuous level and the independent variable had 2 or more groups (3) and no significant outliers. Additionally, the distribution of the dependent variables was normal. For the threat variables, the sphericity assumption was violated given the Mauchly's test p-values were less than .05 for threat susceptibility ($\chi2_{(2)}$=.97, p=.007) and threat severity ($\chi2_{(2)}$=.96, p=.004) between all 3 scores (pre-exposure, proximal scenario and distal scenario). Because of this finding, the Greenhouse-Geisser correction was applied. The Greenhouse-Geisser value was greater than .75 for threat susceptibility (.97) and threat severity (.97). As a result, the Huynh-Feldt correction was used.

Results indicated a significant main effect of scenario exposure on threat susceptibility perceptions ($F_{(1.95, 542.95)}$=38.78, p<.01). Additionally, there was a significant main effect of scenario exposure on threat severity perceptions ($F_{(1.94, 541.12)}$=59.67, p<.01). Post-hoc analyses were conducted using a Bonferroni adjustment. There was a significant difference between means for the pre-exposure and distal scenarios and the proximal and distal scenarios (all ps<.01) for threat susceptibility and severity. The distal scenario presentation resulted in the highest threat perceptions. No significant differences were found between the pre-exposure and proximal scenario for either variable (ps>.05).

Next, a 2-way repeated-measures ANOVA was conducted to measure differences in threat perceptions after proximal and distal scenario exposure for respondents who perceived they had experienced a threat to their water security and those who had not. First, threat severity was analysed and results showed there was a significant main effect of scenario exposure on participant threat severity scores ($F_{(1,278)}$=56.84, p<.01) with the distal scenario exposure increasing threat severity perceptions for both groups. There was a non-significant main effect of perceived experience on individual threat severity scores ($F_{(1,278)}$=3.76, p=.054). There was also no significant interaction between scenario and perceived experience ($F_{(1,278)}$=1.25, p=.27).

The same analysis was conducted for threat susceptibility. The analysis showed there was a significant main effect of scenario exposure for participant threat susceptibility scores ($F_{(1,278)}$=27.16, p<.01), with the distal scenario exposure increasing threat susceptibility perceptions for both groups. There was also a significant main effect of experience on individual threat susceptibility scores ($F_{(1,278)}$=7.42, p=.01) with lower threat susceptibility scores shown for respondents who did not perceive they had experienced a threat to their water security. There was no significant interaction between scenario and perceived experience ($F_{(1,278)}$=1.96, p=.16). Table 4 shows the mean and standard deviations for relevant variables for this analysis.

Table 3: Mean (SD) of EPPM variables for each condition.

Variable	Pre-exposure	Post-exposure Proximal	Post-exposure Distal
Threat susceptibility	4.44 (1.21)	4.47 (1.21)	5.04 (1.17)
Threat severity	4.26 (1.28)	4.15 (1.31)	4.96 (1.22)

Discussion

Understanding the influence of psychological distance on individual perception could assist in the construction of effective risk-communications. This study attempted to understand how framing a threat as proximal or distal could affect an individual's threat perceptions in the water security context and how this may be influenced by perceived previous experience of such events.

In line with previous research, it was predicted that there would be a difference in threat perceptions after exposure to proximal and distal scenarios with proximal scenarios predicted to elicit higher threat perceptions (Deng et al. 2017; Scannell and Gifford 2013; Spence, Poortinga, Butler et al. 2011). The case study sample showed statistically significant differences in perceived threat severity and susceptibility at pre-exposure compared to perceptions after exposure to the distal scenario and between proximal and distal scenarios. Exposure to the distal scenario resulted in higher threat susceptibility and severity perceptions in comparison to pre-exposure and proximal scenario responses. Additionally, it was found that there was no difference in threat perceptions between pre-exposure and post proximal scenario responses. Therefore, the hypothesis was partially supported in relation to distal but not proximal scenario responses.

Previous research suggests that threat perceptions may be influenced by psychological distance in that a proximal event would result in greater individual concerns and receptivity than one that was distal (Deng et al. 2017; Scannell and Gifford 2013; Spence, Poortinga and Pidgeon 2011). The current study results somewhat conflict with the research conducted by Scannell and Gifford (2013), who indicated that participants were more receptive to personally relevant messages or information about a local event than distant or global information. Additionally, and specific to the water-security context, the results also conflict with the research conducted by Deng et al. (2017), whereby proximal events were more predictive of behaviour in participants experiencing drought.

Table 4: Mean for threat variables for each scenario for each experience group.

Threat variable	Scenario	Perceived experience (n=233)	No perceived experience (n=66) M (SD)
Threat susceptibility	Baseline	4.61 (1.16)	3.86 (1.25)
	Proximal	4.52 (1.17)	4.28 (1.31)
	Distal	5.16 (1.14)	4.65 (1.19)
Threat severity	Baseline	4.34 (1.27)	3.84 (1.41)
	Proximal	4.20 (1.29)	4.01 (1.37)
	Distal	5.05 (1.25)	4.65 (1.09)

According to CLT, a psychologically distant event may inhibit mitigation behaviour and does not elicit threat perceptions as much as proximal environmental events (Liberman et al. 2007). However, participants in the current study reported higher threat perceptions after exposure to the distal scenario, which was framed around an event that may occur and was further away in terms of psychological distance. The differing results between previous research and the current study can perhaps be explained by the contextual experiences of the current study sample. These contextual experiences should be considered in all results, given the disastrous effects they had on the community and the timing of data collection.

The distal scenario may have been more threatening to the current sample given the wide-ranging effects described within this scenario, including mass soil erosion, decreased pond/dam levels and a shortage in stock production. This result may be due to this information being new to respondents who were accustomed to the current water restrictions. Townsville is geographically surrounded by rural communities that are reliant on livestock and vegetable farming industries for economic support. As such, participants of this study may have been familiar with the larger scale negative effects that may occur due to water security issues, such as widespread agricultural loss (CSIRO 2011). These other consequences may have been more threatening than more local impacts, such as continued water restrictions.

Greater distance resulting in higher threat perceptions aligns with the research conducted by Spence and Pidgeon (2010), where the framing of climate change impacts as distant resulted in these impacts being perceived as more severe. Researchers concluded that this result emphasises that climate change is a naturally psychologically distant phenomenon (Spence and Pidgeon 2010). Perhaps it may be that water insecurity is considered a naturally distant phenomenon, like climate change, even for those currently experiencing its adverse effects. Therefore, the events and consequences described in the distal scenario are more far-reaching, affect more people and contribute to the increase in the Townsville sample threat perceptions.

Previous experience may have also led to the non-significant difference between pre-exposure and after exposure to the proximal scenario. Despite flood occurring and the Ross River Dam being over-capacity, water restrictions were still in place. As a result of the recent drought in the region, the perceived threat of a drought within the sample may have already been high at baseline. The reality (pre-exposure) for participants of this study was similar to some of the information presented in the proximal scenario vignette. For example, the proximal scenario referred to water restrictions being in place. Thus, threat perceptions did not change from baseline

to post-proximal scenario exposure. As suggested in the health research by Roberto et al. (2019), repeated exposure is argued to desensitise viewers to the threat. Therefore, it is not surprising that reading the proximal scenario produced little change in threat susceptibility and severity for the sample. In addition, the majority of participants did not own their home, which may influence their exposure to local council water rates that fund accessing and maintaining potable water, contributing to overall perceptions of price for water and potentially threat perceptions of water scarcity. In terms of future communication, describing a previously lived experience that a community has coped with may assist with preparing for such events without unnecessarily raising threat perceptions or concern in a community.

When considering previous experience specifically, however, this may have further implications for communication. Having experienced a threat previously would make an individual perceive they are more susceptible to future events, as it has happened before and is almost certain to occur again within the region (Spence, Poortinga and Pidgeon 2011; Zaalberg et al. 2009), as predicted in hypothesis 2 for the current study. Those who may not have experienced such events may need convincing about the personal relevance of the event to encourage behaviour change, specifically using information targeting threat susceptibility. This argument is based on previous research stating that proximity to the coastline and more frequent exposure to climate-related events (specifically flooding) led to increased climate change beliefs, greater concern for climate change and increased engagement in pro-environmental behaviour (Milfont et al. 2014; Spence, Poortinga, Butler et al. 2011). This is comparable to the research by Zaalberg et al. (2009) who found that residents living in flood-prone areas in the Netherlands were more worried about future flooding and perceived the consequences of future flooding as more severe, perceived themselves as more vulnerable to future flooding and had stronger intentions to take adaptive actions than those who had not been exposed to flooding. In the local context, a community survey revealed that the majority of respondents who had experienced previous floods in both Queensland and New South Wales were more engaged and knowledgeable about flooding in their region (Taylor et al. 2023a). Therefore, the current study provides evidence that the effect of previous experience on threat perceptions may apply to other areas where water-related issues, like drought, commonly occur. For the current population, given exposure to such events both in terms of recency and frequency, it would be expected that previous experience would be an indicator of water conservation behaviour.

In the current study, 22% of the sample did not perceive they had experienced a threat to their water security, despite likely having previously experienced a major drought and flood, given the timing of the data collection. Although perhaps a true reflection of inexperience, it is worth considering that this result may highlight the lack of understanding about what is viewed as a threat to water security, particularly given people's ability to cope with such events. Given individuals living in the region are familiar with these events, this sample may not perceive these issues as long-term water security threats but rather as 'natural disasters' as they are commonly presented or described in the media (Hart and Feldman 2014), which are likely to be accompanied by scare tactics to encourage behaviour. This is consistent with findings by Taylor et al. (2023b) who, through discussions on preparedness behaviours with risk-prone communities, evidenced how people in Australian often view flooding as episodic rather than persistent threats to water security. Furthermore, the case study group experienced a significant drought and was limited to specific water-related behaviour; however, they could still access and use the resource. This may have lessened threat perceptions of the drought and similar events threatening water security over time for this sample.

There is some consideration for the relationship between past environmental threat experiences negatively influencing future responses. For example, research by Demuth et al. (2016) found that past hurricane experience, in terms of previous evacuation or financial loss, increased evacuation intentions. This has been found in previous literature where experience led to increased behaviour (Haney 2021; Spence, Poortinga, Butler et al. 2011; Zaalberg et al. 2009). However, the opposite has also been found, with those who experienced past hurricane-related emotional effects (emotional distress) exhibiting lower self-efficacy, which decreased evacuation intentions (Demuth et al. 2016). Additionally, and more pertinent to the water-security context, Deng et al. (2017), in contrast to other known literature (e.g. Liu et al. 2022) found that previous drought experiences had no relationship with water-saving behaviour. This research may suggest that the concept of perceived experience requires an in-depth examination to understand whether event context, event type, water security knowledge or coping strategies, pricing of water and home ownership may have influenced participant responses in the current study, and more specifically, in a region that frequently experiences water-related hazards. Regardless of these mixed findings, this highlights problems with creating communication that may attempt to raise threat perceptions about water security to encourage mitigation behaviour in samples such as those from Townsville, where water-related hazards have frequently occurred.

Limitations

Although the Townsville region is a novel location to study, the sample is not representative of the Australian population. Results cannot be generalised across Australia but may be generalised to communities that have experienced threats to water security. This study did not account for household water pricing as a factor influencing perceptions of scarcity, which may have affected how participants viewed the urgency of water conservation. This factor differs greatly across Australia and could be the subject of other work.

Conclusion

This research took an approach grounded in psychological theory and provided considerations for future construction of water security communications, specifically in a community that had recently experienced major water security issues. Results presented several challenges to those communicating potential threat information, particularly given proximal water security threats are perceived as less threatening than distal water security threats and threat perceptions being known drivers of behaviour.

Exploring the effect of proximity on individual threat perceptions may provide a better understanding of individual behaviour in response to environmental issues. With threat perceptions being significantly different between regions, it is reasonable to assume that communication strategies should take this into consideration. This research highlighted the complexities of threat perceptions in the water security context, particularly for individuals who have experienced major issues in the past.

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