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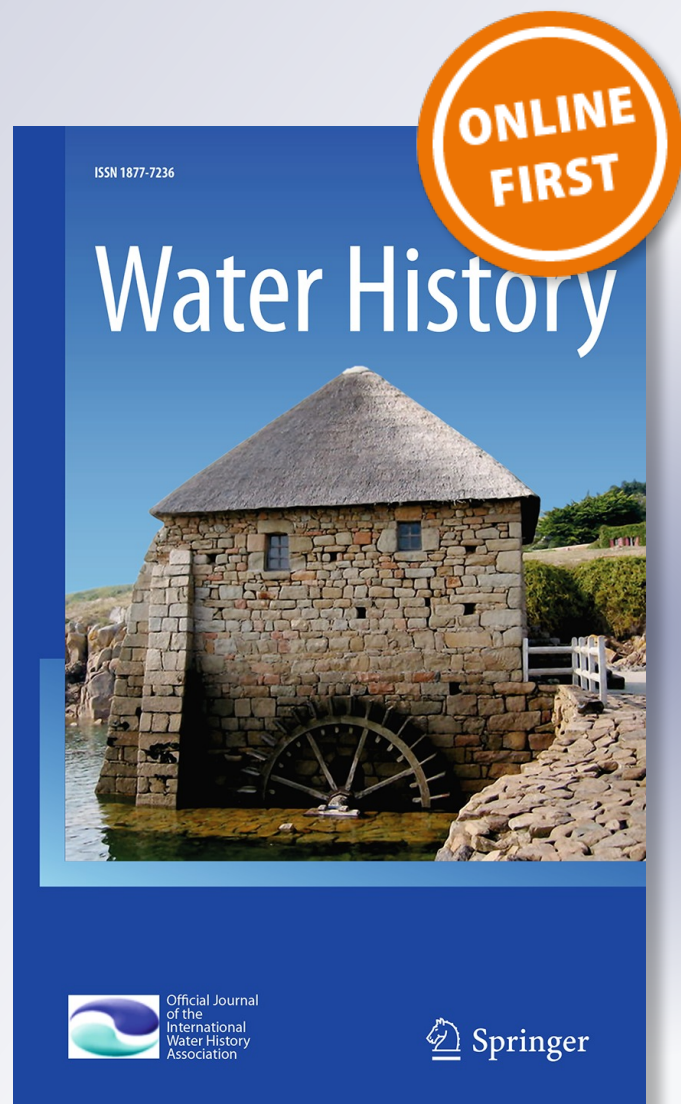
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# Life after death: evidence of the Hoover Dam as a hero project that defends against mortality reminders

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**Abstract** Dams have historically been constructed as a supply management strategy to control water despite increasingly recognized sociocultural, environmental and financial costs. Current water management strategies continue to depend on technology-based solutions despite these costs. We used a transdisciplinary approach to link water history and social psychology to examine the underlying influences on water decisions such as the construction of large-scale water infrastructure. Specifically, we used indicators from terror management theory—a social psychology framework to understand how humans’ efforts to repress their death awareness influences motivation and behaviour. We focus on symbolic immortality as a powerful way by which people overcome their death fears in a highly individualistic Western and secular society. In this research three interrelated questions. First, was there evidence of mortality salience indicators in discussions of the Hoover Dam? Using the Hoover Dam as a historic case, we identified mortality salience evidence in the public statements during the dam’s pre-construction, construction, and post-construction phases. We found abundant mortality salience in the public statements about the Hoover Dam during all phases. Second, could the Hoover Dam be classified as a legacy project or “hero project” as defined by Ernest Becker and subsequent research through terror management theory? The evidence suggested that the Hoover Dam—as a representative example of the large scale, water infrastructure that dominates our contemporary supply-management regime—might have served as a hero project for those involved in its installation. And third, could the Hoover Dam, and possibly other large dams, be a means to overcompensate for mortality-fears for those involved in their installations, contributing to an environmentally unsustainable but historical water management legacy? Characterising the Hoover dam as not only a water supply infrastructure

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project but also as a hero project intended to alleviate mortality-fears, offers complementary explanations as to why unsustainable water management decisions were made in the American West.

**Keywords** Emotion · Ernest Becker · Fear · Hero project · Hoover Dam · Infrastructure · Mortality awareness · Social psychology · Terror management theory · Water supply

## Introduction

Climate change will affect water resources through increased uncertainty and the intensification of extreme flood and drought events. These changes will compromise water supply and established management regimes (Postel 2000; Vörösmarty et al. 2000; Tvedt and Coopey 2010; Hamlet 2011; Sivakumar 2011). As more of the world's population lives under water-stressed conditions climate constraints may contribute to social unrest, political upheaval and the need for new transboundary allocation agreements (Homer-Dixon 1994; Jury and Vaux 2007; Raleigh and Urdal 2007; Wolf 2007; United Nations 2010). To compensate for natural limitations and to meet water demand and consumption choices, societies have historically controlled water through dam construction (Altinbilek 2002; Malmqvist and Rundle 2002; del Moral Ituarte 2010; Jakobsson 2010; D'Souza 2011; Miescher 2014).

Small dams have been used to manage water supply and to ensure humans' water demands are met; these include food production through irrigated agriculture and hydro-electricity generation for domestic and manufacturing consumption (Malmqvist and Rundle 2002; Braemer et al. 2010; Kamash 2012; Leone 2012; Wilson 2012). As water demands have grown, so too have the dams' size and associated costs. Construction of new dams has become increasingly expensive as large dams are built in less optimal locations. Labour expectations and associated costs have also changed, increasing the necessary maintenance costs to ensure dams' efficiency and safety (Bureau of Reclamation 2011). Other costs include environmental damage—stream fragmentation, aquatic species loss, increased nutrient concentration and eutrophication, along with unsustainable over extraction of lakes, riverbeds and aquifers. In some cases these massive dams have reduced long-term water supply by disconnecting water demand choices from natural constraining factors—leaving behind a negative rather than positive water legacy (Karr 1991; Stevens et al. 1997; Al Radif 1999; Jackson et al. 2001; Malmqvist and Rundle 2002; Daigger 2009; Gleick 2010; Vörösmarty et al. 2010).

Yet despite our vast technical knowledge of water access, treatment and distribution, our contemporary water management regimes remain highly dependent on the socio-political context of scientific knowledge production and the often-fragmented adoption of that knowledge (Shapere 1964; Gleick 1998; Mårtensson 2000; Martin et al. 2001; Larvor 2003; Tvedt and Oestigaard 2010; Hagen et al. 2011; Pahl-Wostl et al. 2007). Given this reality, along with the impending challenges of climate uncertainty, we need a better sense of the underlying social and psychological mechanisms that shape individuals' and societies' water perceptions and decisions (Tvedt 2010). A transdisciplinary understanding of water history will be crucial as water has always been influential in humans' thoughts, emotions, and cultural worldviews (Halliday 2005; Tvedt and Oestigaard 2010; Fagan 2011).

In this study we linked historical methods for case study design, data source validity, and analysis with theoretical insights from environmental and social psychology. Environmental history, and water history specifically, offers a rich trove of methods and cases for exploring psychology insights about our worldviews, social context, and the influence on our stated intentions and actual behaviour (Ostrom et al. 1999; Arndt et al. 2004; Vess and Arndt 2008; Fox et al. 2010; Fritsche and Hafner 2012; Dickinson et al. 2013; Graupmann et al. 2013). In this study, we draw on insights from terror management theory (TMT) to assess perspectives on large-scale water infrastructure. Terror management theory offers a framework to examine how humans' efforts to repress their mortality awareness may subtly influence motivation, choice and behaviour (Dickinson 2009; Kasser and Sheldon 2000).

Our first objective was to identify whether there was a link between mortality salience (MS) and the Hoover Dam. We reviewed public statements—during the pre-construction, during the construction, and post-construction periods—in news press for MS indicators that have been traditionally used within clinical Terror Management studies. Second, we built an argument that the Hoover Dam can indeed be understood as a “legacy project” or “hero project” as described by TMT. Third, we proposed the Hoover Dam is an example of how societies overcompensate for mortality-fears using large-scale water infrastructure installations, thereby contributing to an environmentally unsustainable water management legacy.

Renowned water scholar Peter Gleick (2000:136) suggested that to shift away from reliance on large-scale infrastructure projects, planners and water managers “must provide information that helps people to make judgements about which ‘needs’ and ‘wants’ can and should be satisfied”. These are wise words. We suggest that water historians—coupled with insights derived from psychological processes—can offer significant and valued contributions to discussions of water infrastructure and larger social judgements about water resources.

## Bridging history, social psychology, and water management

### Western ideals in water supply management and infrastructure

In the early 1900s, particularly in North America's arid west, water was considered ‘wasted’ if it flowed to the ocean unused or harnessed by humans (Rosenberg et al. 1995; Pisani 2002; Reuss 2005). This was not a new way of thinking. The American economist Henry Carey (1868: 123) wrote about American's relationship with nature and declared “the earth is a great machine, given to man to be fashioned for his purpose.” Humans' perceptions of their role in/separate from nature have always determined how we have managed and changed our local environments. Cultural values—particularly religious beliefs—have been highly influential interpreting humans' relationships with nature in different ways (Ponting 1991).

The Euro-American population settling in the American West were either immigrants or decedents from immigrants of Judaism and Christian European countries. Within these belief systems, humans were understood to be divine blessings and God himself granted the position of being stewards of creation thus placing humans in a superior position to nature (Armstrong and Armstrong 2006). From the Industrial Revolution a reductionist or mechanistic understanding the world separated the ‘machine’ into smaller and smaller

parts for further analysis. By the early 1900s there was little debate that humans were entitled to exploit and engineer the natural world for their benefit (Oelschlaeger 1993; Jackson 2005). This notion of progress or ‘Manifest Destiny’ was proclaimed by O’ Sullivan (1845: 6) with “our manifest destiny to overspread the continent allotted by Providence” was an essential mission of liberty and economic opportunity. The emergence of different water management patterns throughout history have always been intricately linked to humans’ attitudes towards nature.

Early California explorers considered the land to be a barren, arid and largely unproductive intersected by the untamed Colorado River with its ruthless and destructive floods. These were unfamiliar landscapes to European immigrants (Flores 1998). John Wesley Powell traversed the entire length of the Green and Colorado Rivers; he concluded that the arid plateaus and plains’ agricultural potential was extremely limited even with a secured water supply and irrigation (Reisner 1987: 47).

Yet the ‘dreamers’ and capitalists—helped along by federal politicians eager to secure territorial expansion—saw California as a challenge to test their engineering powers, thereby altering ‘God’s’ landscape and manifesting their destiny (Hundley 1975). For example, impressive engineering advances in the first half of the 1900s drove the technocentric perspective where water management practices followed a centralized and linear pattern that sustained water supplies through construction of large-scale infrastructure projects (Hundley 1975; Jackson 2005; Daigger 2009). But by disconnecting water from nature, the technocentric perspective prioritized economic development and control of local, regional and national water supply through ever expanding infrastructure and management regimes (Gleick 1998, 2000; Tvedt and Oestigaard 2010). As a result, in the United States over 75,000 dams greater than 6 m high were built in the latter half of the nineteenth century (Milliman and Farnsworth 2011).

For some critics, the cost of new dam construction increasingly outweighs the benefits provided as economically viable sites became scarce (Gleick 2010; McCully 2001; Evren 2015). Over the last three decades, this technocentric supply approach has slowly shifted to include a management style that allows for greater water efficiency and conservation concerns (Gleick 2000). But water demands are ever increasing and China’s Three Gorges Dam and Ethiopia’s Grand Ethiopian Renaissance Dam attest to the still dominant supply approach (Bouwer 2000; Lazarova et al. 2001; Wu et al. 2004; Vugteveen and Lenders 2009; Le Mentec 2014; Whittington et al. 2014). Large dams are, according to Swayamprakash (2014) “unique stamps of human technological superiority over nature” (p. 153). Using social psychology and TMT, we explore below this need to leave our ‘stamp on nature’ and history.

## Terror management theory and mortality salience

Humans’ extraordinary cognitive capacity has given rise to language and culture. Both language and culture allow humans an awareness of time, the ability to understand self in relation to others, and the capacity for planning and deferred gratification. But these abilities entail a significant psychological cost: a pervasive and unavoidable awareness of and, ultimately, fear of mortality.

Drawing on social anthropology and Freudian–Jungian psychology, Becker (1973) explored how self-awareness in the context of knowledge of the broader universe generates feelings of impotence and insignificance; similarly, awareness of one’s own unavoidable death also influences human behaviour. He argued that one’s conscious and subconscious



anxiety around death is the central driver of human behaviour, explaining “why we do what we do” (Becker 1973).

Becker’s ideas have been tested, expanded and codified through a long-standing social psychological research program called TMT (Solomon et al. 2004). This program has explored the influence of *mortality salience*—reminders of our vulnerability and incapable mortality—on behaviour and decision-making and is supported by over 300 empirical studies demonstrating how MS has unique effects and defense responses (Greenberg et al. 1993; Arndt and Solomon 2003; Pyszczynski et al. 2004; Landau et al. 2004; Greenberg 2008; Burke et al. 2010). In the TMT framework, human culture and psychology are considered to be, in part, concurrent adaptive responses to fears of death. Humans generate reassurance of their significance and self-worth using individual-psychological and group-cultural responses to redirect or temporarily block mortality salience.

Researchers have identified two psychological mechanisms in particular. “Proximal defenses” minimise or marginalise death thoughts when they surface into consciousness (Pyszczynski et al. 1999). These defenses include: denial that a problem exists or that it will continue; minimization of the problem’s scope or implications; or rejection of human contributions to the problem or role in possible problem resolution.

In contrast, “distal defenses” keep death thoughts unconscious through sublimation and displacement (Pyszczynski et al. 1999). Distal defenses include projects to bolster self-esteem through seemingly unrelated mechanisms of increased out-group antagonism—an us-or-them identity response to threat—and a tendency to reinforce the individual’s or group’s worldview (Greenberg et al. 2000).

Culture provides socially sanctioned roles, behaviour models, and symbolic immortality projects. These roles, models and projects allow an individual to “live on” beyond one’s time-limited biological existence. In this way, a society recognises and values some activities over others as worthy of history. Generating and bolstering one’s self-esteem through cultural recognition mitigates feelings of vulnerability. Individuals feel like valued members of society if they live “successfully” within the parameters set out by their cultures.

Becker argued that “hero projects” allow individuals to generate self-esteem and self-worth through actions that their society values and affirms (Florian and Mikulincer 1998). Becker defines a hero project as “a mythical hero-system in which people serve in order to earn a feeling of primary value, of cosmic specialness, of ultimate usefulness to creation, of unshakable meaning. They earn this feeling by carving out a place in nature, by building an edifice that reflects human value: a temple, a cathedral, a totem pole, a skyscraper, a family that spans three generations” (p. 5). Expanding from Becker’s ideas, empirical studies have demonstrated that hero projects are an effective means to provide an individual with a sense of purpose and meaning in the world, effectively buffering MS effects (Florian and Mikulincer 1998; Sligte et al. 2013).

Hero projects can be symbolic or literal. Literal projects include embracing the religious belief in heaven or reincarnation. Through both symbolic and literal hero projects, individuals seek to be “part of something” bigger and longer lasting than their biological selves. Any threat to that “something,” such as a change or rejection, can cause the individual significant psychological and even physical distress.

Examples of symbolic hero projects include nation building (e.g., Palestine and Israel), association with sports teams, constructing monumental architecture (e.g., Egyptian pyramids, Trump’s towers), or creating social movements (e.g., Greenpeace). The Hoover Dam, for example, not only possesses practical uses but holds symbolic value, cosmic specialness, and undeniable meaning in American history, meeting the hero project criteria

as stated by Becker (1973). Symbolic immortality may be the most powerful way by which people overcome their death fears in a highly individualistic Western and secular society (Kim and Markus 1999; Oyserman et al. 2002; Sligte et al. 2013).

## Methodology

Terror Management Theory offers a complementary explanation for why individuals within a cultural context were motivated to construct outstanding-but-unsustainable water infrastructure projects. We suspect that consideration of mortality salience may contribute to ongoing historical assessments of social and cultural aspects of large dams in water management history. But there have been no studies that explicitly link TMT with modern historical interpretations of large-scale water supply systems. Conquering nature was one of the primary accomplishments for the Euro-Americans who strongly prescribed to the Manifest Destiny cultural worldview: if nature could be conquered by humans to meet the needs of America, then American's possessed the necessary determination and resourcefulness to overcome the Great Depression (Billington and Jackson 2006). Given this perspective, could large-scale hydroelectric dams—as massive engineering achievements—be symbolic immortality projects? Could these structures be the engineers', workers' and politicians' legacies and a psychological buffer for their death-thoughts and sense of vulnerability? President Roosevelt hints at this potential in his dedication speech on September 30, 1935: "Today marks the official completion and dedication of the Boulder [Hoover] Dam, the first of four great government regional units. This is an engineering victory of the first order—another great achievement of American resourcefulness, American skill and determination."

## Case study

Within the American cultural worldview, the Hoover Dam is recognized as an iconic engineering marvel and a symbol of human conquest over nature (McCully 2001; Hiltzik 2010; Jackson 2011). Arguments for the dam emphasized the benefits for the local population: generating electricity, preventing regional flooding and securing water for agricultural irrigation in a sunny but naturally arid landscape (Bureau of Reclamation 2011). In addition to the services to be provided by the dam, the Bureau of Reclamation employed 21,000 people during the height of construction. As part of President Roosevelt's New Deal program (1933 to 1938)—programs and policies to aid in relief, recovery and reform for the nation during the Great Depression—this job program in particular provided a significant financial relief to the unemployed and their families (Leuchtenburg 1968; Billington and Jackson 2006; Black 2006; Hiltzik 2010; Bureau of Reclamation 2011).

Yet the Boulder Canyon Act—designed to divide control for the upper and lower portions of the Colorado River—was highly controversial. The agreement to approve the Boulder Canyon Act in 1928, further threatening water security in Arizona but allowing for California to harness a water supply, aided in the approval processes to construct the Hoover Dam between April 20, 1931 and March 1, 1936 (Hundley 1975). The dam was built as a concrete arch-gravity structure on the Colorado River in the Black Canyon between Arizona and Nevada, USA. It is 221.4 m high and was the largest hydroelectric dam of its time (Bureau of Reclamation 2011). Lake Mead was created as a construction by-product and serves as a large water reservoir (248 square miles at completion) for



surrounding communities. Hoover Dam now provides water to over 18 million people throughout California, Nevada and Arizona and four billion kilowatt-hours of electricity on average annually (Bureau of Reclamation 2011). Although no longer the largest dam in the world, it has ensured the legacy of its creators by existing as a national historic landmark, an engineering wonder, and a major tourist destination.

## Data collection

A single case study design was used to identify mortality salience in public declarations during the Hoover Dam pre-construction, construction and post-construction periods. Using a single case study design allowed for an in-depth analysis to establish a very specific and novel understanding of the Hoover Dam within its complex historical context (Stake 2007). Popular mass media with significant national and regional distribution were used as data; these sources had large readerships and represent the contemporary American culture of the time (Mazur and Lee 1993; Altheide and Michalowski 1999; Boykoff and Boykoff 2004; Baxter and Jack 2008; Carey and Adam 2009). A convenience sample of three prestigious American news sources, each with nation-wide distribution, was used: *Time* magazine, *The New York Times*, and the *Los Angeles Times*.

Each media source had an online searchable archive. Using their internal search engines, the key terms “Boulder Dam” and “Hoover Dam” were used to identify sources mentioning or discussing the dam. To further narrow the data collection, advanced search constraints were applied to obtain articles between the years 1921–1946. This temporal range included the decade before the dam construction start date, the duration of construction, and the 10 years after the official completion date. To finalize the data set, a systematic sample of every twentieth article was selected from the oldest to the newest publication date in both *The New York Times* and the *Los Angeles Times* (Bryman and James 2005). Due to *Time* magazine’s smaller overall sample size of potential articles all of the articles were coded. The total number of sources identified and sampled is presented in the results section below.

## Data coding and analysis

A preliminary review was used to identify articles that contained substantive public discussion about the Hoover Dam and mortality salience (MS) evidence. If the article did not contain MS evidence but mentioned the Hoover Dam, it was recorded as part of the total article count allowing us to compare the total number of relevant articles to the total number of relevant articles with MS evidence. Once the first data review was completed, the articles were coded for MS evidence using categorical aggregation to derive new meanings and generalisations (Stake 1995).

The codebook was based on insights from cognitive-affective science and social psychology. Researchers have argued that recalled feelings, current emotional states, and the anticipation of feeling certain emotions help to determine humans’ cognitive processes and rational reasoning (Raghunathan and Pham 1999; Loewenstein et al. 2001; Dolan 2002; Druckman and McDermott 2008). In addition, there is clinical neuroscience research that supports the particular importance of negative emotions (Ohman 2010).

Given these insights, the codebook included implicit and tacit emotions that are triggered by mortality salience or that are a result of repressing death thoughts (e.g., *Fear* and *Anxiety*) and the associated antonyms (e.g., *Happiness* and *Relief*). Two additional explicit feelings were added to the codebook to accommodate important aspects of achieving

symbolic immortality, a known MS buffer: *Sense of Responsibility* and *Sense of Accomplishment* (Lifton 1973; Florian and Mikulincer 1998; Sligte et al. 2013). The codebook included all these emotions and feelings to capture any redundancy or overlap. Allowing for this overlap is essential to accurately capture any implicit emotions that the researcher may interpret differently due to their own biases (Davou 2007). The coding table indicators were extracted from established research on death awareness in cognitive processes and emotions, in particular the work of TMT researchers. The codebook was organized to capture these indicators:

- Temporal context
- Explicit or implicit use of terms; and
- Positive and negative valence.

*Temporal Context* Coding the data published before, during, and after dam construction captured mortality salience evidence that changed over time. Within each of the temporal periods, quotes were identified according to text references to the past, present, and future events or other factors. This temporal search allowed us to identify patterns and to assess whether the type of MS evidence changed over time. For example, the data might indicate a “future” sense of security from building the dam or “present” feelings of fear or terror as result of a flood threat from the Colorado River.

*Explicit and Implicit Uses of Terms* To account for multiple causes of MS and the differences between explicit and implicit emotions, each word or phrase coded as MS evidence was also coded as explicit or implicit (Gyurak et al. 2011). For example, the term *fear* could be coded as:

1. *Explicit use* “I feared what may happen if the Colorado River wasn’t dammed”;
2. *Implicit use* “Floods result in catastrophe”, referring to an unknown or visceral emotion, feeling, or state of being that can be alluded to depending on the article context and sentence structure (Krippendorff 2004).

*Positive and Negative Valence* Emotions can be charged with positive or negative valence (Lerner and Keltner 2000). Both negative and positive charges were useful in this study. Negative valence can potentially bring greater awareness to implicit evidence of mortality salience. Emotions with positive valence were used to assess whether the Hoover Dam’s existence buffered against mortality salience effects. For example, if Hoover Dam is indeed a symbolic immortality defense mechanism, then in the post-construction period, we should see less negative emotions and more positive emotions. To encompass all the variation and the different MS evidence, both positive and negative valence terms were coded (Lerner and Keltner 2000; Druckman and McDermott 2008).

Upon completion of the coding table, the collected media sources were coded and compiled in tables for further analysis.

## Results

### Population and sample sets

In this research, a total population of 7163 sources mentioned either “Hoover Dam” or “Boulder Dam” was identified. These sources included presidential speeches presented (e.g. State of the Union Addresses, Inaugural Addresses, Hoover Dam Dedication), and magazine and newspaper news or commentary articles published between January 1, 1921

and December 31, 1946. From the total population sources, 617 sources became the sample set subject to further analysis (Table 1). All of the 31 presidential speeches were reviewed and all 145 *TIME* articles were reviewed. Every 20th article was reviewed from the total 5634 *Los Angeles Times* and total 1 353 *The New York Times* for mortality salience evidence.

Of the initial 617 sources, 327 sources contained evidence of mortality salience and were amenable to data analysis (Table 2).

### **Evidence of the Hoover Dam as a ‘hero project’ over three time periods**

We analyzed whether the Hoover Dam could be considered a hero project that served to buffer feelings of fear and anxiety created by mortality reminders. If it were a hero project, we anticipated that we would find evidence of negative emotions prior to construction. Once the dam was completed, those feelings should have dissipated and the negative emotions replaced with feelings of happiness, well-being, and security. There would also be a sense of accomplishment if the dam project was accepted and culturally valued (Sligte et al. 2013). This transition and shift in the publically declared emotions would also be evidence of a possible increase in societal self-esteem because high self-esteem garnered through culturally-sanctioned or valued actions effectively minimizes MS effects (Harm-Jones et al. 1997; Pyszczynski et al. 2004). Although proving that the Hoover Dam was a hero project for any one historic individual or political system is beyond the scope of this study, we found evidence of mortality salience; the results are presented and discussed below.

There were more articles on Hoover Dam written during the 10 years prior to construction than during construction and post-dam completion periods. During the pre-construction phase there were many negative emotions—with both past, present and future connotations—when there was MS in text on the necessity to dam the Colorado River (Fig. 1).

During this *pre-construction phase*, the total negative emotion counts exceed the positive emotions and there are noticeably higher counts of present and future (anticipated) feelings of Threat and Fear. Furthermore, present feelings of Anxiety also exist with 48 total counts. As Greenberg et al. (1994) and Rosenblatt et al. (1989) identified, feelings of fear and anxiety—the two emotions that had some of the highest frequency counts in our results—are very common after mortality salience priming. The activation of these negative emotions can occur via automatic or unconscious primes, which have different effects on the recipients’ conscious and subconscious reactions (Pyszczynski et al. 1999). A display of such emotions in relation to the Colorado River can be observed in *Time* magazine on March 7, 1927 “The Colorado River, which men have called “devilfish” and “destiny”, drains the Southwest without replenishing.” Similarly, on August 28, 1927 an article in the *New York Times* declared the Hoover Dam acted as a means for “safe guarding from flood peril of the more than 60, 000 people whose homes are in the Imperial Valley of California” displaying present emotions of Threat and Fear but also how the Hoover Dam provided a Sense of Security. Furthermore, feelings of Anxiety were sometimes present when expressing present feelings of Threat and Fear such as in the *Los Angeles Time* (November 1, 1929) when the author proclaimed “It is not desirable to have any further delay to Colorado River control, considering the danger to which that exposes Imperial Valley.”

Positive emotions appeared in pre-construction discussions of the dam’s potential future benefits including the high count of future Sense of Security (123). This high Sense of

**Table 1** Population and sample set mentioning “Hoover Dam” or “Boulder Dam”

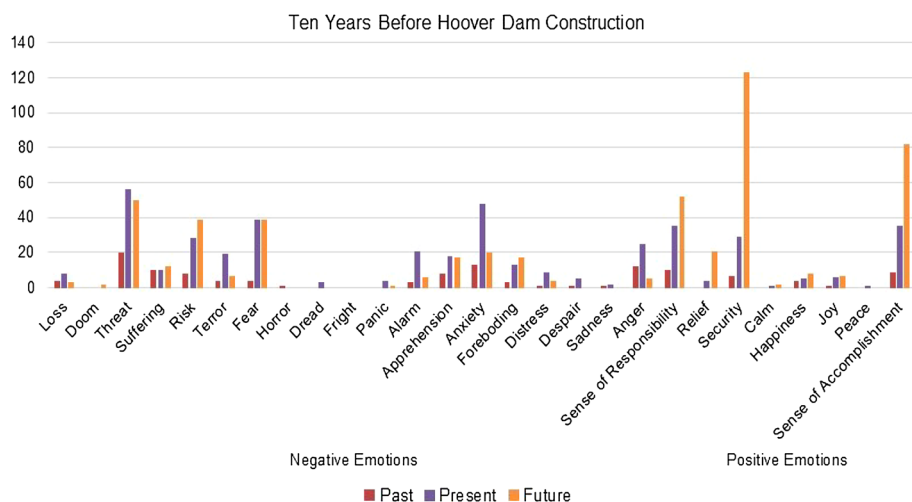
	Population set Number of articles mentioning “Hoover Dam” or “Boulder Dam”	Sample set		
		Before construction 1921–1931	During construction 1931–1936	Post construction 1936–1946
Time	145	66	32	47
Los Angeles times	5,634	105	103	75
The New York times	1,353	99	23	36
Presidential speeches	31	13	6	12
Total	7,163	283	164	170
Grand total	7,163	617		

**Table 2** The sample set containing evidence of mortality salience

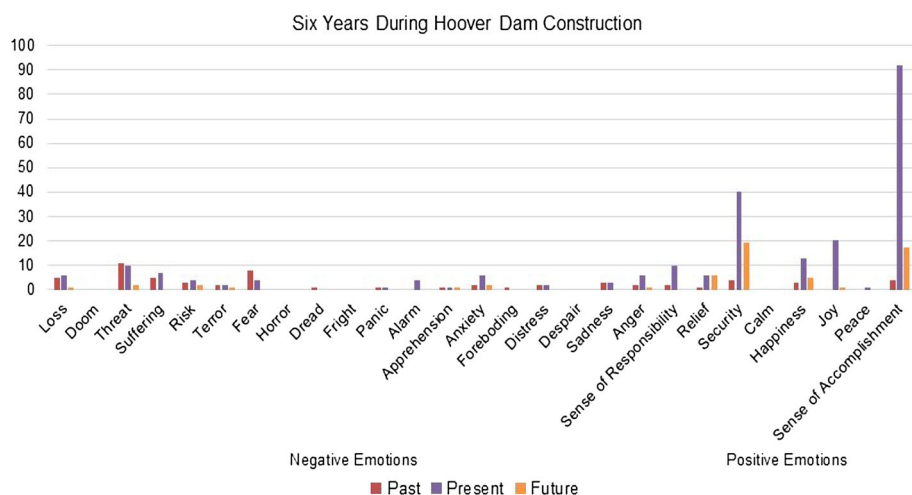
	Before construction	During construction	Post construction
<i>Time</i>	30	17	37
Los Angeles times	59	56	26
The New York times	62	13	24
Presidential speeches	2	1	0
Total	153	87	87
Grand total	327		

Security could be associated with the anticipated removal of literal death threats triggered by the Colorado River flood regimes or the arid landscape. For example, in an article published in the *New York Times* published on August 28, 1927 the author declared the dam as a way of “the reclaiming of millions of acres of desert lands and the safe guarding from floods of the people of the Imperial Valley of California” and in the *Los Angeles Times* on August 27, 1925, “The building of the dam...cannot hurt us at all, for we shall always have ample water when the river is regulated.” Some of the high Sense of Security extended into the future benefits to be received upon the dam completion: “We in California are making a great ado about the wonderful benefits to accrue, particularly agriculturally, when the Boulder Dam is completed” (*Los Angeles Times*, September 22, 1930) or maybe because “no one can estimate [the Hoover Dam’s] value to the nation” (*New York Times*, May 11, 1924). Alternatively, the high future Sense of Security count could be the result of the successful completion of a socially validated hero project, boosting self-esteem and buffering MS effects.

A total of 164 articles were coded during the dam’s *construction period* (1931–1936); of this sub-set, 87 sources contained MS evidence (Figs. 2, 3).

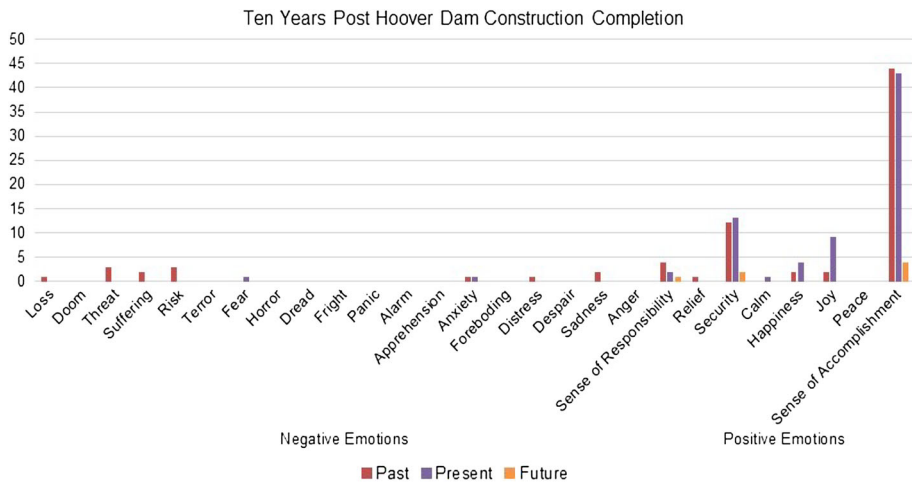


**Fig. 1** Total counts of mortality salience evidence during pre-construction period of the Hoover Dam



**Fig. 2** Total counts of mortality salience evidence during the Hoover Dam construction period

Within the construction period, there are considerably fewer counts of negative emotions—the majority of the evidence had a positive valence—compared to the pre-construction period. There was a high count of a “present” Sense of Accomplishment (92 counts) and Security (40 counts). For example, “one of the outstanding projects of all time is Hoover Dam, now well on its way to completion” (*Los Angeles Times*, January 2, 1935) and “the Hoover Dam brings to this land a promise so great that all the little contending circumstances float away from it” (*Los Angeles Times*, October 4, 1931) both display a Sense of Accomplishment and Security for the project that had yet to have even been completed. Also, those involved in the projects were praised for their work, for example “The ‘Big Six,’ as they are called, have a stupendous job. Theirs is the largest single



**Fig. 3** Total counts of mortality salience evidence during the 10 years post construction

contract ever offered in the world” (*Los Angeles Times*, October 4, 1931). Most of the negative emotions are past references to emotional states that one may have felt or referred to, the Risk associated with dam construction, or the past crises as a result of intermittent drought or the flooding events. For example, President Roosevelt in his dedication speech on September 30, 1935 articulated past feelings of fear, anxiety, and threat using language such as “unpeopled, forbidding desert,” “when in flood the river was a threatening torrent,” and “for a generation the people of Imperial Valley had lived in the shadow of disaster from this river which provided their livelihood.”

In the *post-construction period*, a total of 170 articles were reviewed; 87 articles contained MS evidence (Fig. 3).

There are even fewer counts of negative emotions in the post-construction phase than in either the pre-construction or during the construction period. The majority of the evidence falls into the past and present feelings of Security (25 combined count) and Sense of Accomplishment (87 combined count). For example, during this time the public statements read as “the Colorado River projects are giving us a new hand-hold on destiny” (*Los Angeles Times*, November 19, 1938) or “Hoover Dam, the mightiest of its kind and one of the twentieth century Wonders of the World” or when referring to the dam itself, “The beauty of it,’ They say, ‘The beauty of it!’” (*New York Times*, December 18, 1938). A Sense of Accomplishment could also be identified in statements that praised those involved in the erection of the dam: “Kaiser and his men, who helped put up Grand Coulee Dam (largest in the world), Boulder and Bonneville dams, the San Francisco-Oakland Bridge (longest in the world), are natural-born nose thumbers at nature” (*Time*, August 31, 1942).

During the post-construction period, the minimal use of negative terms is almost entirely attributed to the writers or speakers’ past tense references, i.e., at the time of writing, authors did not express negative emotions about the dam. Further support of MS evidence during this period were the articles that discussed dam tours and how people from all over came and “swooned” for Hoover Dam. These references suggest that the Hoover Dam was much more than just a flood control and irrigation project—it became a symbol of achievement for the American people (McCully 2001; Duchemin 2009).



## Discussion

This research was motivated by three interrelated questions. First, was there evidence of mortality salience indicators in discussions of the Hoover Dam? Second, could the Hoover Dam be classified as a legacy project or “hero project” as defined by Ernest Becker and subsequent research through TMT? And third, could the Hoover Dam, and possibly other large dams, indeed have been a means to overcompensate for mortality-fears for those involved in their installations, contributing to an environmentally unsustainable but historical water management legacy? For each of these three questions, we answer ‘yes’, but we offer our conclusions with caveats below.

First, we determined that the use of various TMT indicators could and did show mortality salience in historical, statements about the Hoover Dam before, during and after its construction. For individuals that were both directly or indirectly involved with Hoover Dam, there was evidence of conscious or unconscious mortality awareness. This awareness was expressed through both explicit and implicit feelings of fear and anxiety. Future comparative research to further test if mortality salience helped to motivate the construction of large-scale water supply system projects should be identified case-by-case.

Second, this dam could be singularly considered as a hero project because of its capacity to have ‘outlived’ those who worked to create it; an essential characteristic of a project that transcends death by symbolically extending one’s own mortality (Becker 1973; Lifton 1973; Sligte et al. 2013). But our analysis of the expressed emotions about the dam further confirms its status as a hero project. As a hero project, it should have alleviated the negative effects brought about by mortality salience while also fulfilling self-esteem needs, e.g., feelings of a sense of accomplishment (Lifton 1973; Florian and Mikuliner 1998; Sligte et al. 2013). The dam exemplifies the activation of a non-rational distal defense system, a psychological function where the existence of a culturally valued symbolic immortal-self, such as a material product or object, continually defends against or suppresses unconscious death-awareness (Pyszczynski et al. 1999). The creation of a culturally validated and internationally recognized immortality project such as a hydroelectric dam would boost feelings of accomplishment or achievement, bolster self-esteem, and reduce overall death-anxiety by suppressing death-thoughts (Schimmel et al. 2001; Greenberg et al. 2010).

The temporal shift from negative to positive emotions we found in the data suggests that the Hoover Dam had some anxiety- or fear-reducing effect for those involved in its construction. We found evidence of minimal negative emotions in the post-construction phase and the emergence of a higher positive emotion count. We also found a much higher count of a Sense of Accomplishment, which may demonstrate that the dam was socially valued and bolstered self-esteem; two indications of the security function that a hero project provides (Schimmel et al. 2001). The concept of self-esteem is widely accepted by the majority of psychological theories with terror management theorists claiming that self-esteem serves at least as an essential component for security and overall well-being, protecting us against our existential fears (Pyszczynski et al. 2004; Schmeichel et al. 2009).

Our conclusion that the Hoover Dam as a hero project is in line with findings from other research on the prevalence of symbolic immortality projects in Western, secular and individualistic societies (Kim and Markus 1999; Oyserman et al. 2002; Du et al. 2013). Western societies possess a deep and complex fear of nature which reminds individuals they are “subject to the natural laws of death and decay.” (Koole and Van den berg 2005;

p. 1015). As an attempt to alleviate death-anxieties brought about by nature, individuals distance themselves from nature by attempting to remove the 'wild' from wilderness by controlling nature using culturally-valued symbolic immortality projects (Koole and Van den berg 2005). Beyond hydro-electric dams, there are many types of immortality-oriented hero projects that provide similar death-anxiety buffering effects. Some other studies American studies have shown that wealth accumulation and material consumption are both examples of immortality projects as they can provide the individual an illusion of transcending death (Arndt et al. 2004; Jonas and Fischer 2006; Fritsche et al. 2010; Zaleskiewicz et al. 2013). Cross-cultural differences of MS effects and the types of defense mechanisms triggered are new areas of TMT study but early research provides tantalizing evidence that perhaps, if the American West held a different cultural worldview such as holistic rather than individualistic or living in harmony with nature rather than against it, individuals' hero projects would have emerged as possibly less obtrusive forms.

Third, it is possible that mortality salience and our psychological defenses to repress this awareness is highly influential in our water management decisions. For all of the defensive protection a hero project offers, that project may only provide a temporary defense against death-thoughts because bolstering self-esteem is an ongoing pursuit (Crocker and Park 2004). The need for ongoing self-esteem bolstering presents an intriguing possibility that people, such as those involved in making major water management decisions in the American West, may have unconsciously sought and supported continued investments in supply-side water management projects such as dams or other grandiose resource-securing projects, to defend against death-awareness because mortality salience is unavoidable. Social psychology is very clear that activating a symbolic distal worldview defense can result in overlooking the long-term negative consequences, including environmental consequences, as people unconsciously prioritize their own worldview and defend against MS. Hero projects motivated by mortality salience may have whether directly or indirectly, influenced historical water management outcomes and other resource management strategies. Mortality salience evidence within historical public statements before, during, and after Hoover dam construction supports this premise and raises questions about the 'rationality' underpinning critical historical water decisions. These supply-focused water management decisions may not have been necessarily poor decisions, but they could have been misinformed decisions if the unconscious motivation was driven by mortality salience. This tendency is something that should receive greater consideration in evaluating historical unsustainable water decisions.

## Conclusion

Our research findings raise additional questions: have existential concerns unconsciously motivated individuals to construct other large-scale infrastructure projects throughout history? Were these decisions for personal conquest or were they truly intended to benefit society as a whole? Further inquiry and research would be useful. To expand further and use the lessons we have learned from the Hoover Dam project, future research using a TMT framework could explore how people embedded within the American West historical cultural context were motivated to construct aesthetically outstanding but unsustainable water infrastructure projects. From our analysis and perspective, Hoover Dam, at least in part, was motivated by mortality salience effects and possesses the characteristics of a hero project.

The MS evidence identified in the historical public statements around the decisions before, during and after construction of the Hoover Dam answered our primary research questions and raised further question about the potential role of MS in motivating psychological defenses of engineers, technicians, researchers and policymakers. Identifying evidence of MS would help water historians and current water managers move towards a better understanding of how throughout history, conscious or unconscious death-awareness has likely affected human rational reasoning, contributing to decisions to erect large-scale water infrastructure projects and possibly impeding sustainable water management decisions.

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