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Human Psychological Response to and Benefits of Interior Water Features

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The University of Southern Mississippi

Human Psychological Response to and Benefits of Interior Water Features

by

Alissa Clouse

A Thesis
Submitted to the Honors College of
The University of Southern Mississippi
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of the Requirements for the Degree of
Bachelor of Science
in the Department of Interior Design

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Human Psychological Response To and Benefits of Interior Water Features

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Abstract

Water features such as water fountains, water walls, fish tanks, and fish ponds are being installed more commonly in interior spaces, but limited research on how these interior water features psychologically affect individuals has been conducted. The hypothesis assumes that individuals have an overall positive reaction to interior water features.

Water features have been used in a variety of places such as healthcare facilities, childcare centers, adult centers, and commercial spaces to create a calming environment. Sounds of softly trickling water have replaced background music in some facilities in order to promote a healing atmosphere. Because water features are installed in many places, it is important to establish if these features do positively affect individuals psychologically.

In order to study individuals' psychological responses to interior water features, two surveys were conducted. The first survey, administered by a West Coast university in 2013, polled individuals on a variety of topics pertaining to interior water features. The second survey, issued in Hattiesburg, Mississippi, in 2016, included questions from the first survey in the Gulf Coast region. These questions examined demographic information and personal preferences toward interior water features. Over 550 total individuals were polled for their responses. The data was gathered and analyzed to gain a better understanding of general preferences.

Keywords: interior design, water features, water wall, water fountain, fish tank, fish pond, human psychological response, interior water feature, survey, commercial design, residential design

Acknowledgements

As a young girl, I have always had a fascination with nature, most specifically water in nature. In design school, I found that I used water features as accent and focal pieces within many of my designs. Through the support and advice of many individuals, I began to consider the importance of researching how interior water features affect individuals on a psychological level. I owe these individuals a large thank you. First, to my adviser Mrs. Nancy Bounds for her constant advice and support- from one challenge to another, she always offered superior assistance and guidance. Without her guidance, I could never have achieved as much as I was able to with this research. Next, my department head, Mrs. Claire Hamilton, for her patience, guidance, and helpful direction through the entire process. I also appreciate Dr. Richard Mohn for his expert knowledge and tutelage on the statistical analysis of my research findings. For all faculty and staff of the Honors College, most specifically Mrs. Paula Mathis, for her continual kindness, help, and encouragement- I truly could not have done this without her. For my professors and director who offered support and advice on my research. All my classmates, who encouraged me and supported my research. Also, to all those friends, family, and others who took my survey, I was overwhelmed by the immediate response. Finally, to everyone who has listened to my research topics and offered insight into how to improve. I am truly thankful for all of you and hope that all of our efforts help individuals and designers across the world begin to understand the importance of interior water features.

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Overview

Because water features are being used more frequently in interior and exterior design projects, new studies must be conducted on how these water features affect individuals on a psychological level. This research explores the psychological benefits water features may have for adults, children, and senior citizens in public and private environments. In order to establish a holistic understanding of how water features affect individuals, two studies were conducted, one out of California and the other out of Mississippi. These surveys polled a total of 550 individuals, asking specific questions regarding their reaction to interior water features. The purpose of this paper is to compare the findings in order to understand interior water features as psychologically beneficial to individuals in commercial and residential spaces. The author hopes to educate individuals on the benefits of interior water features in private and public environments.

Chapter One: Introduction

Throughout history, water has been a central requirement for the existence of humanity. Humans are not only familiar with water, but they also understand their relationship to water in the sense that they are utterly dependent upon it. Settlements around the world can be found near streams, rivers, and lakes, demonstrating how closely our ancestors relied upon water (Heerwagen and Hase, 2001). As humanity progressed through technology and cultural sophistication, humans were afforded the opportunity to live away from natural water sources. Yet, they still heavily relied upon water for mundane and vital functions of life; therefore, water was transported to them using new technology.

Running water is generally taken for granted in America because of how common it is. In spite of this, there is a growing recognition that humans need to be in contact with water in a more natural environment than in a sink or toilet. Thus, Americans may need to return to their roots and reincorporate more natural water elements within their space. As more individuals recognize the great mental benefits water brings, they look for ways to increase their quality of life through incorporating water features (Ogunseitan, 2005).

Designers and architects have used water features in exterior settings, such as fountains in a garden or koi ponds, with great success. Most individuals agree that having an outdoor fountain promotes an air of sophistication, elegance, and relaxation (Andrade and Devlin, 2014). The general idea of water in an outdoor space has so infiltrated our lives that many people desire to have exterior water features outside their homes. Fountains, ponds, swimming pools, and lakeside locations are all key aspects

many individuals look for when considering a residential purchase. People have recognized their psychological need for water and so have begun to turn toward bringing water features from the exterior environment into the interior space. Water features and interior ponds in large buildings and federal structures were once very common. Viewers were mesmerized by the beauty and elegance of these spaces and desired to have them in their own business environments (Heerwagen and Hase, 2001). Technological and plumbing advancements have progressed to such an extent as to allow water systems to become a common item in any workplace. One of the reasons interior water features are being installed more often is that researchers have discovered when natural elements are brought into an interior space, individuals feel a sense of connection to the natural environment (Heerwagen and Hase, 2001).

Interior water features can be defined as a feature placed in an establishment that utilizes a display of water. This can include water walls, water fountains, ponds, fish tanks, or any other feature that displays water (see Appendix A for an illustration of these terms). Interior fish ponds try to simulate a lake or pond of fish, whereas a fish tank is a more commercialized view of the ocean. A water wall is a representation of a waterfall and a stream, and a water fountain is a commercialized representation of a geyser.

A general assumption that all individuals enjoy water features and have a positive reaction to a space that houses them may not be correct; individuals in areas with limited access to water may feel that water features waste precious water resources (Heerwagen and Hase, 2001). This feeling may result in a negative reaction to water features (Heerwagen and Hase, 2001). For this reason, it is important to carefully survey the benefits of water in interior spaces and compare it to individuals' overall psychological

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response to water in order to gain a holistic view of whether water features are truly psychologically and neurologically beneficial to individuals. The surveys issued for this research demonstrated that individuals have an overall positive reaction to water features.

Chapter Two: Review of Literature

Water Through History

There are numerous applications in which water has been used over the lifetime of humanity. It is the very essence of life and the means to sustain life. Because of this, humans have a very distinct connection with water. Not only does it provide life, but it is also a means of bringing humans back to their natural roots and relaxing the body.

Heerwagen and Hase (2001) speculate that one of the main reasons water brings humans back to this point is because of the savannah theory. This theory claims that our ancestors were considered hunters and were very connected to the earth and water sources for their livelihood. Because of this, humans developed an overall need and innate desire for nature in their lives (Heerwagen and Hase, 2001).

Water has a plethora of attributes that bring out positive responses in individuals such as relaxation and calmness. Designers and architects often recognize the benefits of water to create a positive atmosphere, incorporating water features in public and private designs. Interior water features have become a commercially viable market, important to research. Discovering the reactions of individuals to interior water features is part of this research.

Psychology and Water

One of the overarching ideas concerning water is the fact that it enables a psychological response from individuals and triggers senses such as sight, smell, and hearing. Maslow's hierarchy of social needs lists important aspects of human needs and how to achieve a higher quality of life (Ogunseitan, 2005). One of the ways to promote this higher quality of life is through reducing stress. Water is one of the mechanisms that

has been studied and proven to reduce stress in individuals (Kopek, 2012, Kuller, 1973). The stimulation of sense leads to an emotional response, which in turn, leads to a higher form of living (Kuller, 1973). In large urban cities, small gardens with ponds act as areas of refuge, escape, and relaxation. Psychologists agree that most individuals have a positive attraction to nature and, therefore, to specific aspects within nature (Kuller, 1973).

Water, an element of nature, promotes an overall feel of relaxation and calmness. The brain becomes conscious of the rhythmic sound of water splashing against itself and the soothing, swaying motion of the water. Kuller (1973) recognized that many individuals become fixated on the sound or motion of water. The sound of a dripping faucet or the swaying of seaweed in a fish tank can cause some individuals to forget what they are doing and think only of the water in front of them. It creates almost an entrancing physiological atmosphere that instantly draws the brain to a center of relaxation and simplistic living (Andra and Devlin, 2014).

Water in Healthcare Facilities

Despite the fact that water features were associated with an overall negative view in areas of healthcare, technology, and plumbing systems have advanced to such a state as to boost the confidence of doctors, nurses, psychologists, and patients toward having interior water features. One of the reasons water features is being more accepted in healthcare is the well documented fact that interaction with nature helps individuals recover quicker (Andrade and Devlin, 2014). This idea of humans benefiting from interaction with nature is known as tophophilia and biophilia (Ogunseitan, 2005, Heerwagen & Hase, 2001, Stephen R Kellert, 2008). Topophilia implies that patients

interacting with nature exhibit a strong sense of place and purpose within the environment. If an individual feels they have a purpose, then they also feel they have a reason for living and fight harder to recover. Water, as an element of nature, stimulates individuals' emotions toward having a sense of place, and gives them a connection to the environment through relaxing the mind (Heimer, 2005, O'Leary, 1975). This brings calmness over the patient, which allows the patient's body to recover more quickly and sleep easier without being consumed with worry and stress.

Another reason individuals are allowing water features within healthcare facilities is that they encourage a sense of biophilia, which is a love of nature. The psychological benefits of biophilia are newly researched ideas and demonstrate how humans relate to nature and how they desire a biophilic interaction (Kopec, 2012). Within healthcare facilities, biophilia can play a large role in promoting a sense of well being and personal responsibility (Ogunseitan, 2005). When individuals have an emotional response to nature, they feel responsible for preserving nature. In order to help preserve nature, they must be in the world and making a difference, interacting with nature (Kellert, Heerwagen, & Mador, 2008). Through using water features in the healthcare facility, it encourages this overarching desire to become one with nature and work toward preserving it, which in turn relates to the patient's quicker recovery. In this light, design is beginning to lean heavily upon using water features in healthcare (Ogunseitan, 2005).

Water Features and Children

Many individuals consider water in healthcare facilities to be beneficial for adults, but overlook the fact that children also highly benefit from interior water features. N.S. Cotton (1984) describes space planning using water features as a way to develop a

cohesive environment that works toward helping children in these healthcare facilities.

One specific area is within the therapeutic healthcare unit for children. He explains that a simple water feature in the facility can help relax the child's brain and physically elicit a sense of peace and trust (Cotton and Geraty, 1984).

One water feature being used more commonly in applications like this is fish tanks. Fish tanks are a water feature that allows for a very contained environment that can be placed in a number of areas, more specifically in individual rooms inexpensively. The motion of the water in fish tanks, as well as the soothing colors within the tanks, entertains children and causes them to relax. Many times in therapeutic facilities, children are nervous and scared which they show by clinging to parents, crying, or overarching shyness through doubt. Having a water feature in the room calms their emotions and elicits a sense of trust and amusement which in turn helps the therapist to work more productively with the child toward a speedier and heartier recovery (Cotton and Geraty, 1984).

The fact that children respond well to nature and specifically water is not new knowledge. Studies describe the fact that children need to be exposed to water in order to have their minds properly developed (Scott, 2010), showing that nature enhances the neurological learning of children and actually promotes their overall mental and developmental growth. Water, specifically, encourages playfulness. It invites children to touch it and experience the cool, wet feel of the water upon their fingers (Scott, 2010). This invitation brings trust, exploration, and creativity to the forefront of children's brains, and therefore, encourages a more holistic learning style.

Water Features and Adult Workplaces

By understanding that children learn easier when exposed to natural elements, such as water, it becomes much clearer that adults also need to be exposed to such elements in order to enhance their own learning. The learning process is never complete; daily, individuals are learning new knowledge and developing new skills. Adults need to interact with nature in order to access their creative side, as well.

Some companies have discovered that their employees work better in conditions where nature is more prevalent and thus have included water features throughout the workplace environment. One company created a room with multiple fish tanks on a wall. Employees have the freedom to utilize this space at any point in the day to refocus and relax while experiencing the swaying motion of the water and the rhythmic movement of the fish through the tank (Groves and Knight, 2010). Employers found that once their employees had taken time to refocus, they were more productive and enjoyed their job more. This is especially helpful for occupations that have large amounts of stress involved to help employees find a peaceful escape for a few moments before reconvening at their hectic job.

Another company decided to bring their physical location, in sunny California, into the inside of their facility. They had an area designed that resembled a sunny poolside spot with bright colors and palm trees surrounding the tanning benches around the faux pool (Cohen, 2005). The owner of the company expressed his desire to have this type of atmosphere because he felt it would allow his employees to be more in tune with their environment to enhance their performance, creativity, and ingenuity.

Aquatecture

Water features within the interior are becoming a growing trend specifically in the United States in healthcare facilities, education, as well as workplace environments. But as this trend continues to grow, more and more companies will push the limits on what interior water systems can do in respect to how much it enhances individuals' mental, emotional, and developmental capacities. Having more design options for water features inspires architects and designers to incorporate nature and water for direct involvement in individuals' lives. Thus, a new form of architecture is beginning to take rise called aquatecture. This form of architecture uses water to create the actual structure of the building (Wylson, 2013). The exterior walls are made directly of flowing water and can change based on technological sensors that stop the flow of water in specific areas. This type of architecture fuses the need for a psychological interaction with water, exterior wall structure, and art into one venue allowing viewers to not only see the nature before them, but to actually experience it (Brown J. L., 2008). This is a large leap toward global design. The designers' purpose was to design a space that people can interact in, no matter what background they are from (Williams, 2007, Groves and Knight, 2010).

Water is a universally acknowledged element of nature in which people around the world have a positive response. Therefore, water in design is a way for designers to move towards a more humanistic design which can support sustainable design initiatives as well.

Chapter Three: Methods

Survey One Sample

Dr. Dak Kopec, Director of Design for Human Health at Boston Architectural College, as well as his students, developed a survey to test individuals' response to interior water systems. This survey was then sent out in 2013 to individuals in California. It was issued to 243 applicants, both male and female with a variety of occupations and ages, in order to secure an all-encompassing survey (Kopec et al., 2014).

This survey was replicated in the Mississippi Gulf Coast region to 308 individuals in 2016. The data collected from both the surveys was used to analyze responses.

Survey One Procedure

A survey allows individuals to give their honest opinions on interior water systems while still remaining anonymous. This particular survey was issued as a snowball sampling survey, meaning that, once the individuals completed the survey, he or she was asked to forward it to another person. The individuals were polled specifically for their opinions on water features and water in general. Likewise, in the replication of this survey, individuals were asked their opinions on water features as well as their demographic information.

Survey One Variables

Within the survey certain variables were presented. These included demographics and water preference type. After polling individuals to establish their age, gender, profession, and cultural group, specific questions about how they respond to water systems followed. Questions explored individuals' reactions to outdoor water fountains, exterior fish ponds, and aquariums. The questions also asked how people felt about

indoor water features and their expectation of the feelings these water feature would elicit. Individuals were also asked about water feature preferences in a variety of environments, such as their home and workplace. All of these questions aimed to discover how a wide variety of individuals respond to water features, both in exterior and interior settings, and what kind of feeling individuals perceive the features to evoke.

Survey Two Overview:

This study sought to replicate Survey 1 but with fewer questions. By issuing the survey to different demographics of individuals, the survey would generate new answers for a different region of the United States, namely, one located more centrally to a large water source, the Gulf of Mexico. The purpose of this survey was to be able to compare the results of Survey 2 with the results of Survey 1 and identify differences. If no differences arose, Survey 2 would work to confirm the findings of Survey 1 and so further solidify the results of the first study.

Survey Two Sample:

This survey was sent out in Mississippi as a snowball sampling through Facebook postings, email lists, and web links to the online survey. Individuals were asked to forward the survey or share the link with other individuals. In a two week time span, 300 respondents were questioned. The respondents varied in age, cultural group, gender, and occupation, which created a varied respondent pool. There were a number of individuals from countries other than the United States who completed the survey as well.

Survey Two Procedure:

The survey was distributed using Survey Monkey and approved by the University of Southern Mississippi's Office of Research Integrity, IRB (Institutional Review Board).

Once the survey was approved, individuals received a Facebook post or an email with a link to the survey. Individuals were told that the survey consisted of 10 questions that revolved around the topic of interior water systems. The terms *fish tank*, *fish pond*, *water wall*, and *water fountain* were defined at the beginning of the survey for clarification of terms (see Appendix A for an illustration of these terms). Respondents were also informed that all responses were anonymous and that the survey was only for individuals over the legal age of 18. After completing the survey, respondents were asked to forward the survey to help gain a larger and more varied snowball sampling. One week after the initial survey link was sent out a reminder was sent out with a link to the survey for individuals to fill out if they had not done so already or forward to others. Two weeks after the initial survey was published, individuals received a Facebook post and email informing them that the survey was closed and thanking them for their contribution.

Survey Two Variables

The ten questions of this survey were taken specifically from Survey 1 in order that the results would be comparable through the exact use of questions. These questions focused more on the specifics of water features such as the perception of reduced stress, or which water feature an individual preferred in a public space. Although the majority of the questions dealt with water features in general, two of the questions specifically asked about individuals' responses to water features in a public space and a private home setting. See Appendix C for a copy of the Survey Monkey questionnaire.

Chapter Four: Results

The results of Survey Two were analyzed using the SPSS Data Analysis program to test the hypothesis that individuals would have an overall positive psychological response to interior water features regardless of their heritage and, regardless of their age, will prefer it in a variety of spaces. The Survey Two results are discussed first, with the comparative information following.

In Survey Two, the first question collected the age range of participant. Of the individuals polled in survey two, 65.6% were in the 18-25 age range, and 9.7% of the individuals were in the 26-35 age range. The age range of 36-55 comprised 13.3% of the individuals polled. Age 56-65 comprised 8.1% of the respondents, and 3.2% of the individuals were in the 66 and above age range.

In Question Two, the ratio of male to female is determined. The data demonstrated that 91 (29.5 %) of the respondents were male, and 217 (70.5%) of the respondents were female. This means that the majority of those who took the survey were female.

Individuals were also polled on their occupation. The table in Appendix C shows what each number represents and the percentages of individuals that responded with that particular occupation. The majority of individuals that responded were students with the next most common answer being individuals with an occupation in business.

In Question Four, individuals were asked about their cultural group. The majority of the respondents were North American. The second largest group in both surveys (25% for Survey 1 and 4% for Survey 2) consisted of individuals from a Western European culture.

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Question Five dealt with whether individuals thought water features had the ability to lower stress or not. Of the individuals that responded, 64.3% indicated "yes" water features do have the ability to lower stress. Another 27.9% responded with an answer of "probably" while only 2.3% said "no" water features do not have the ability to lower stress.

Question Six asked respondents if they considered interior water features to positively affect their mood. Responses 1 and 2 (True and Absolutely True) comprised 71.9% of the responses meaning that the majority of individuals answered that this was a true statement. Less than 4% of the individuals indicated that they did not believe being near a water feature positively affected their mood.

Question Seven asked individuals to agree or disagree with the statement of "interior water features are important to me." Answers 1 and 2 corresponded to "they are not important" and "they do not matter". These answers only comprised 6% of individuals' responses to this question while 48.1% of individuals answered with they thought water features within public interior environments were nice. Another 36% of individuals indicated that they liked water features within a public interior environment. But, only 8.1% of individuals responded that water features within a public interior environment were very important to them.

Question Eight asked about individual preferences for a particular kind of water feature in a public environment. Data revealed that 42.9% of the individuals who responded to the survey indicated that they preferred water walls in an interior public environment. Both water fountains and fish tanks were the next most popular interior water features comprising 24.3% and 20.3% respectively of the respondents results.

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Only 10.3% of individuals responded with a preference for fish ponds, and 1% indicated that water features had no impact on them.

Question Nine asks respondents what kind of interior water feature they would prefer in their personal home. Responses indicated that 14.3% preferred water fountains in their home while another 39.3% answered that they desired an interior water wall in their home. The next largest percentage, 32.8%, indicated that their interior water feature of choice for their home was a fish tank (answer 3). Finally, both answers 4 and 5 had responses of 10%, meaning 10% of the respondents preferred interior fish ponds in their home, while another 10% indicated that they did not prefer to have any water feature in their home as they believed water features had no impact upon them.

In the final question, respondents were asked if they felt the same experience near an outdoor man-made water fountain as they did when they were near a natural waterfall. This question was asked in order to see if man-made water features were as successful in eliciting a feeling as natural waterfalls. The results were relatively equal. The results showed that 131 of the respondents, 42.5%, indicated that they did feel the same when next to a natural waterfall as when next to a man-made water fountain. Of the respondents, 39.3% indicated that they did not experience the same feelings from natural to man-made water fountains. Another 16.3% of the individuals who responded to the survey indicated that they had never been near a natural waterfall and therefore could not contribute to the question.

Chapter Five: Discussion of Results

The purpose of this research is to gauge whether interior water features are thought to be psychologically beneficial to individuals in commercial and residential spaces. In comparing the two surveys, a better understanding of individuals' preferences nationwide can be obtained. The California survey had a total of 243 respondents, while the survey in Mississippi collected 308 individual responses. These are both substantial numbers that allow information to be compared. The information in the following charts is based on actual response numbers (See Appendix B and C for graphical charts of both individual survey results).

Question One of both surveys asked individuals to specify their age. In the California survey, the largest two percentages of ages were in the 48-55 age range and the 58-65 age range. In the Mississippi survey, the majority of the individuals were in the age range of 18-25. When comparing responses, careful consideration must be made of the age differences in the two surveys. It is difficult to generalize about the effects of age in the two surveys because differences in culture and socioeconomic station can not be ruled out.

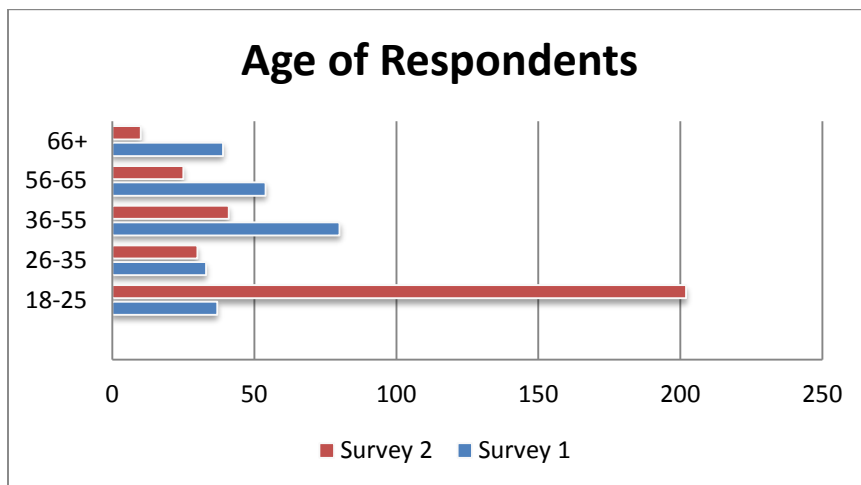


Figure 1: Age range of respondents

Question Two of both surveys established gender. In the California survey, 42% of the respondents were male, while 58% of the respondents were female. In the Mississippi survey, 29.5% of the respondents were male, while 70.5% were female. Because of the larger amount of female responses, the results lean toward a more female perspective of interior water features.

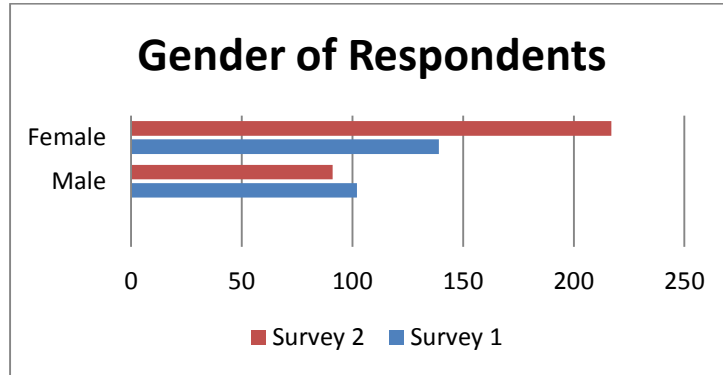


Figure 2: Gender of respondents

Question Three in both surveys addressed the profession of the individual who participated in the survey. In the California survey, there was an even distribution between the professions of business, design, education, healthcare, and other. By contrast, in the Mississippi survey, the majority of individuals were students. After students were accounted for, there was an even distribution between business, design, education, and healthcare.

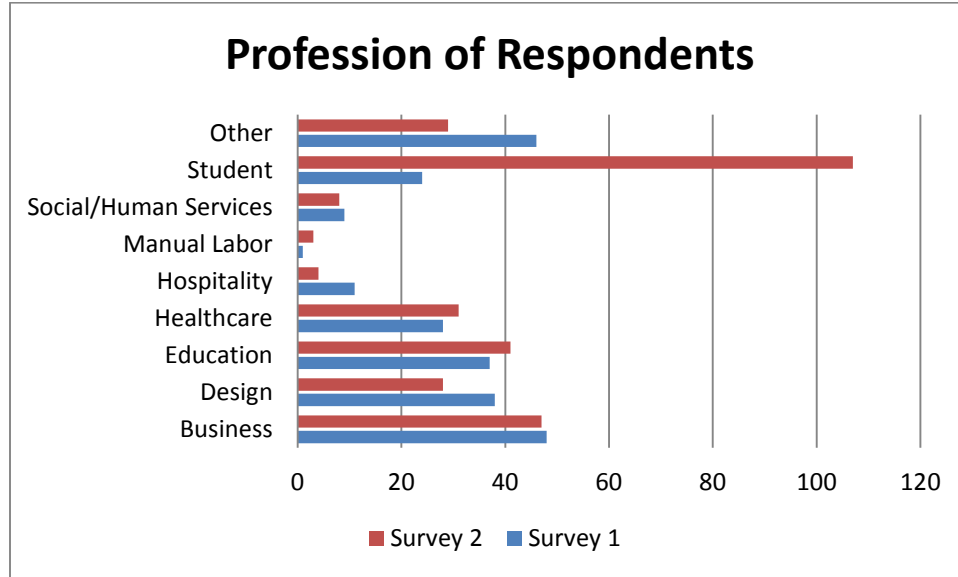


Figure 3: Profession of respondents

The next question in the survey asked individuals about their cultural group. The majority of respondents indicated they were North American. Survey 1 had a large percentage of Western European as well as North American.

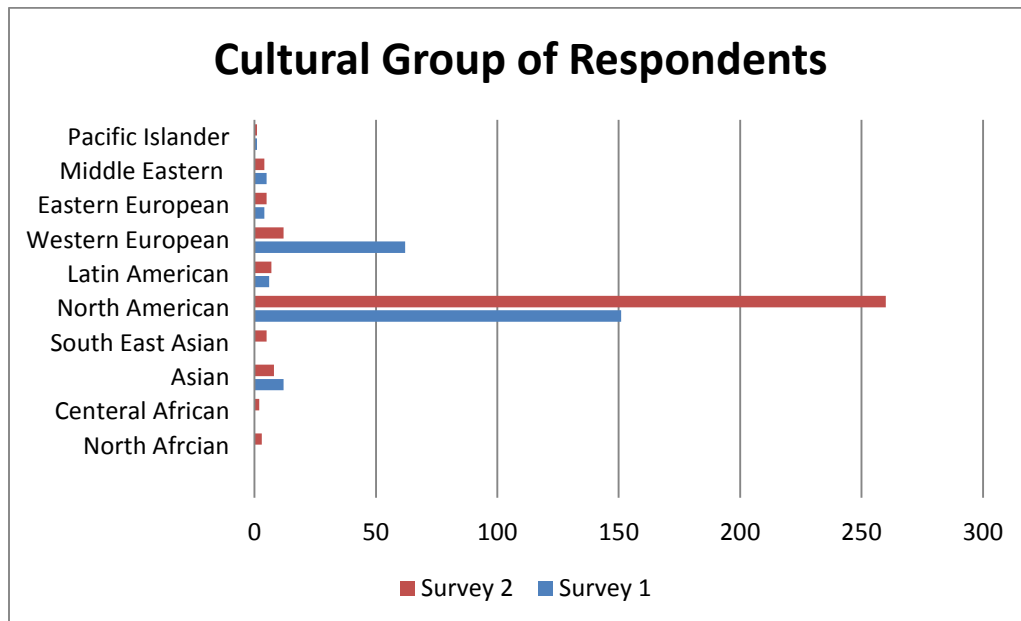


Figure 4: Cultural group of respondents

Both surveys show that water has the ability to lower stress. Less than 4% of individuals from both surveys responded that water features did not reduce stress. From this data, it can be surmised that men and women of a variety of ages, professions, and cultural groups find water features to be a stress reducing agent.

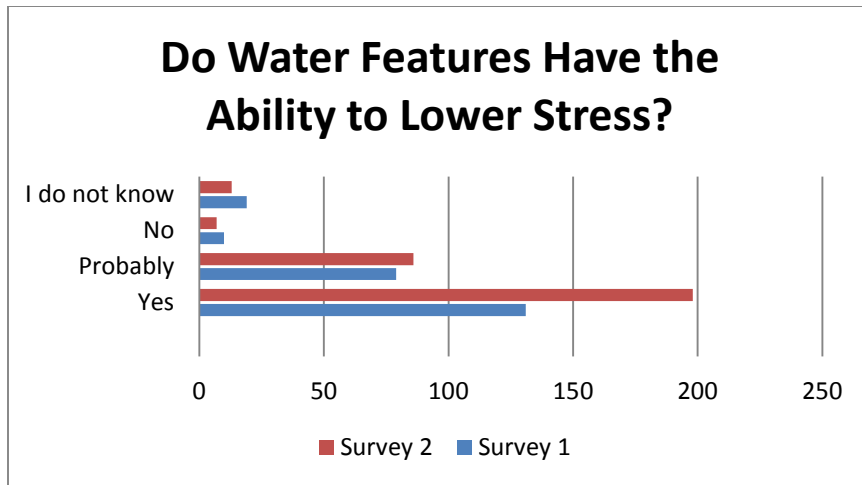


Figure 5: Water feature's ability to reduce stress

Because it can be hypothesized that interior water features help reduce stress, the next question is whether or not they have other positive effects on mood. In both the California survey as well as the Mississippi survey, 55% and 71.9% answered that water features positively affected their mood. Only 8% and 4%, respectively, answered that being near a water feature did not positively affect their mood. With the data and previous research, it can be stated that water features help individuals achieve a positive state of mind.

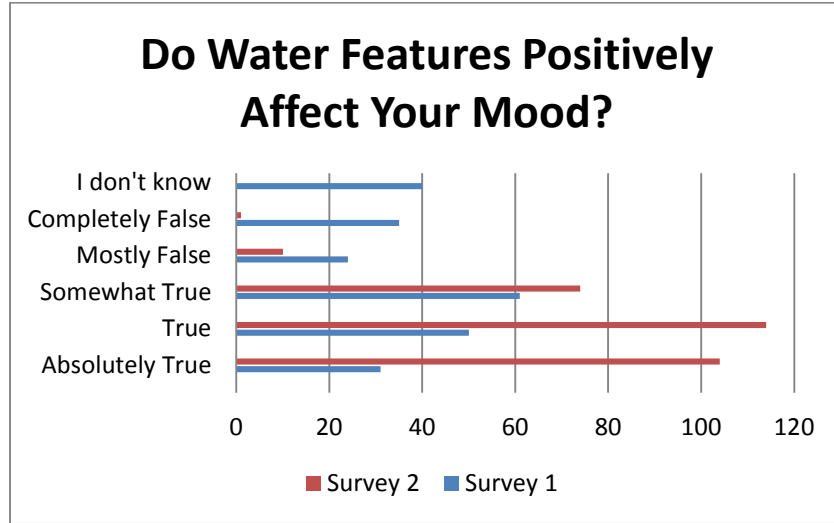


Figure 6: Water feature's effect on mood

Regarding the importance of water features, the majority of respondents stated that interior water features were "nice" or that they "liked them". A large amount of individuals also responded that water features "do not matter" or "are not important". From the information gathered, it is difficult to draw any conclusions.

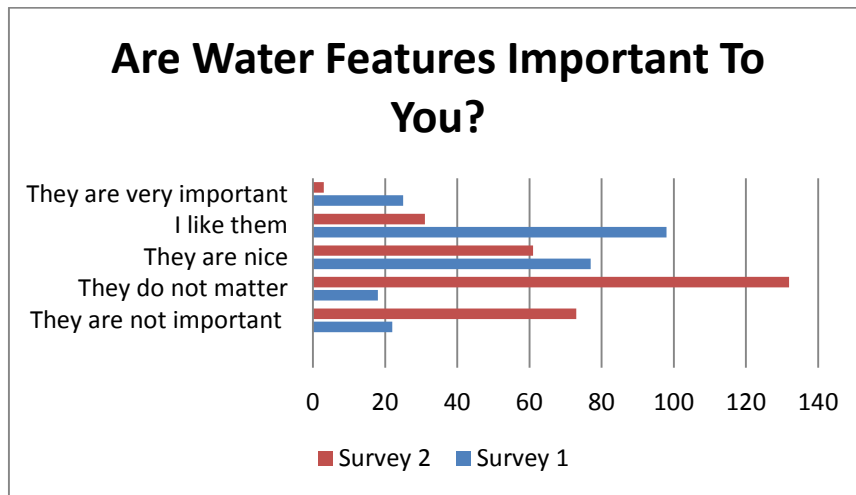


Figure 7: Water feature's importance

In reference to public environments, the results of the survey were similar to the results of the home environment. Of those polled, more individuals answered that they preferred a water wall in a public environment over any other water feature.

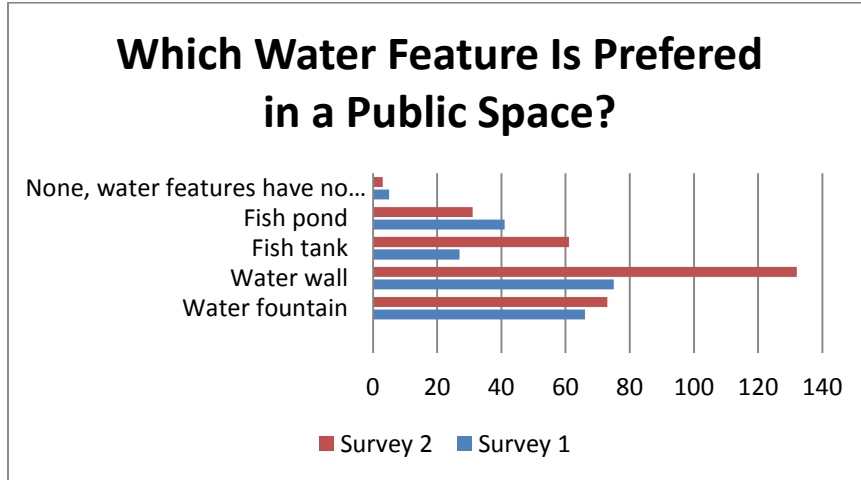


Figure 8: Water feature preference in public space

Both the California and Mississippi surveys attempted to determine which type of water feature is preferred in a private environment. The largest percentage of individuals from the California survey answered that they preferred a water wall or a water fountain, whereas in the Mississippi survey, more individuals answered that they preferred a fish tank or water wall. Interestingly, both surveys recorded a high preference for water walls. The working hypothesis was that individuals would prefer a fish tank in their home over a water wall or a water fountain. This hypothesis was not supported.

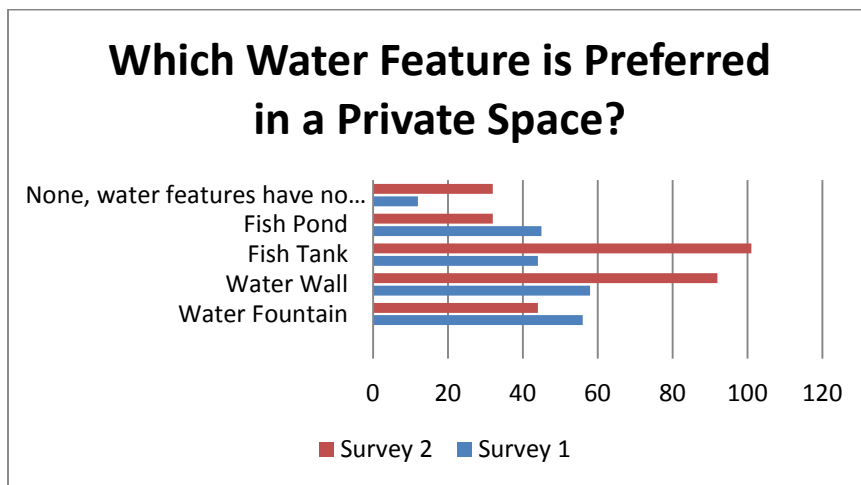


Figure 9: Water feature preference in private space

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The last question in the Mississippi survey asked individuals if they thought being near a water fountain gave them the same feeling as being near a natural water fountain gave. In both surveys, the results were relatively equal in that 44% said it did give them the same feeling. However, 40-53% said it did not give them the same feeling. Because there was no difference between the positive and negative responses, it is difficult to draw a conclusion: it cannot be determined from this question if interior water features are successful at eliciting the same feeling an exterior natural water feature gives.

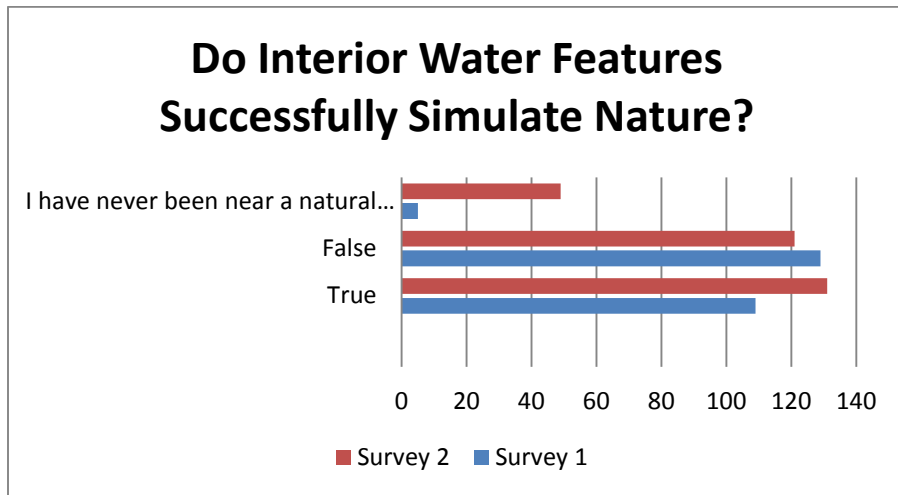


Figure 10: Do water features successfully simulate nature?

Chapter Six: Conclusion

The majority of the respondents felt that water features have the ability to lower their stress and increase their mood, leading to the confirmation of the hypothesis that individuals have a positive psychological response to interior water features.

With this knowledge, designers may understand the calming effects a water feature could have on an interior space, particularly one in a stressful environment. These water features could be used to produce a calm, relaxing environment similar to water features in a spa, or they could be used to minimize irritating background music through soothing water sounds in places like a clinic or dentist office. Environments like call centers or emergency call centers where operators are continually under stress to solve problems or deal with angry customers, could benefit from the installation of a water feature in the building.

Because this particular study focused mainly on a broad understanding of individuals' responses, further research can be done to expand the topic. One area to explore might be the reasons a small percentage of individuals responded negatively to water features. For example, do the demographics or cultural group of an individual have an effect on one's negative response to interior water features?

The study illustrates that many people associate positive moods with being near a water feature. As more individuals are educated on the psychological benefits of interior water features, the public will continue to affirm the installation of water features and their role in promoting more positive moods at both work and home.

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Appendices

Appendix A: Examples of Water Features



Water Fountain



Water Wall

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Fish Tank



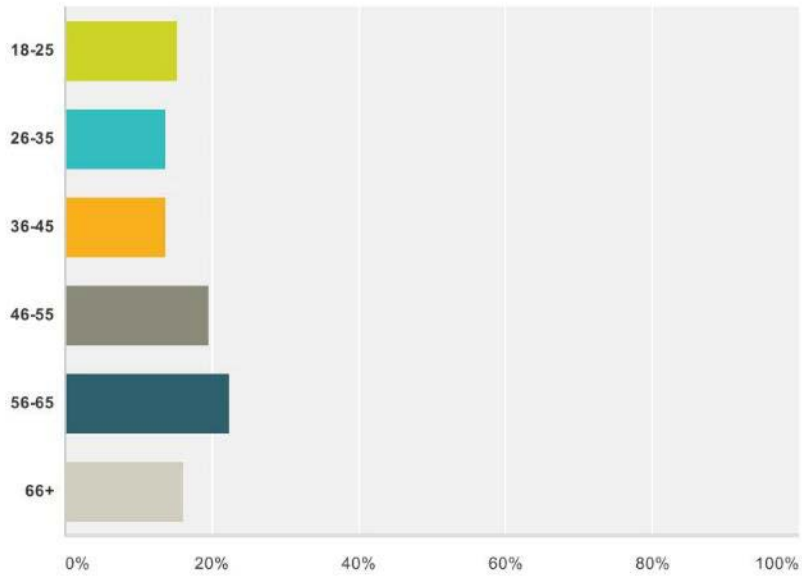
Fish Pond

Appendix B: Survey Results from Dr. Kopec's California survey

The Role of Water Features in A Modern World

Q1 Please select the age range that best describes you:

Answered: 243 Skipped: 0



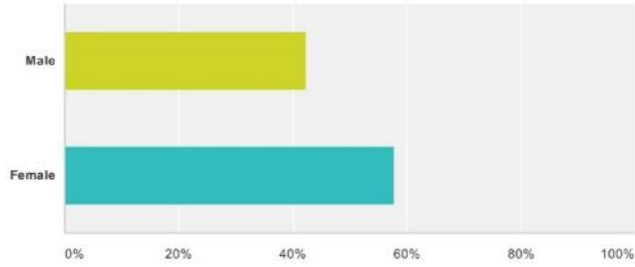
Answer Choices	Responses	
18-25	15.23%	37
26-35	13.58%	33
36-45	13.58%	33
46-55	19.34%	47
56-65	22.22%	54
66+	16.05%	39
Total		243

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q2 Please select the gender that best describes you:

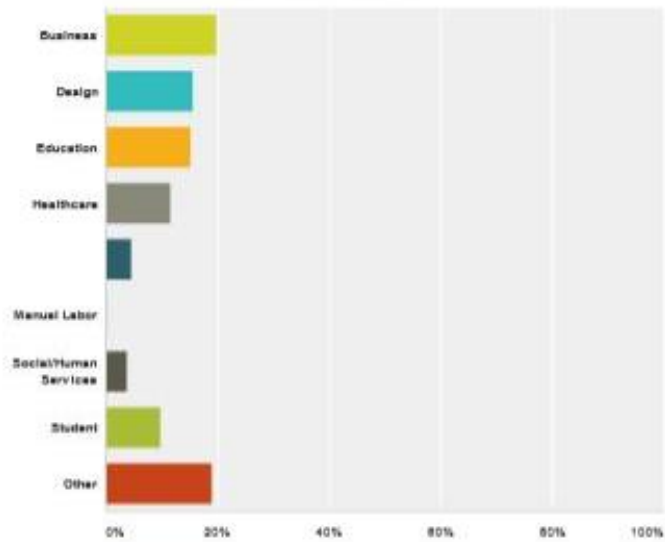
Answered: 241 Skipped: 2



Answer Choices	Responses	Count
Male	42.32%	102
Female	57.68%	139
Total		241

Q3 Please select the profession that best describes you:

Answered: 242 Skipped: 1



Answer Choices	Responses	Count
Business	19.83%	48
Design	15.70%	38
Education	15.29%	37
Healthcare	11.57%	28
Hospitality/Service Industry	4.55%	11
Manual Labor	0.41%	1
Social/Human Services	2.72%	7
Student	9.92%	24
Other	19.01%	46
Total		242

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q4 Please indicate the country where you live

Answered: 242 Skipped: 1

#	Responses	Date
1	USA	1/15/2014 3:04 PM
2	U.S.A.	1/15/2014 12:12 PM
3	USA	1/12/2014 2:32 PM
4	US	1/12/2014 4:38 AM
5	USA	1/11/2014 9:19 PM
6	USA	1/11/2014 6:12 PM
7	usa	1/11/2014 3:54 PM
8	US	1/11/2014 2:14 PM
9	USA	1/11/2014 11:52 AM
10	France and US	1/11/2014 12:33 AM
11	United States	1/10/2014 11:10 PM
12	USA	1/10/2014 4:55 PM
13	USA	1/10/2014 3:40 PM
14	usa	1/10/2014 3:36 PM
15	USA	1/10/2014 12:45 PM
16	United States	1/10/2014 9:36 AM
17	US	1/10/2014 8:30 AM
18	USA	1/10/2014 8:19 AM
19	USA	1/10/2014 7:30 AM
20	USA	1/9/2014 8:48 PM
21	USA	1/9/2014 8:42 PM
22	United States	1/9/2014 7:58 PM
23	us	1/9/2014 7:41 PM
24	United States of America	1/9/2014 5:12 PM
25	USA	1/9/2014 4:57 PM
26	USA	1/9/2014 4:53 PM
27	Canada	1/9/2014 4:30 PM
28	USA	1/9/2014 4:20 PM
29	USA	1/9/2014 4:18 PM
30	USA	1/9/2014 3:53 PM
31	United States of America	1/9/2014 3:38 PM
32	USA	1/9/2014 3:36 PM
33	Canada & USA	1/9/2014 3:28 PM
34	USA	1/9/2014 3:22 PM

Human Psychological Response To and Benefits of Interior Water Features

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35	USA	1/9/2014 3:20 PM
36	USA	1/9/2014 3:13 PM
37	USA	1/9/2014 3:07 PM
38	USA	1/9/2014 2:52 PM
39	USA	1/9/2014 2:12 PM
40	U.S.A.	1/9/2014 11:00 AM
41	USA	1/9/2014 10:58 AM
42	Usa	1/9/2014 7:20 AM
43	U.S.A.	1/9/2014 7:02 AM
44	United States	1/9/2014 3:04 AM
45	Engineer	1/8/2014 9:39 PM
46	USA	1/8/2014 9:14 PM
47	U.S.	1/8/2014 8:03 PM
48	USA	1/8/2014 7:46 PM
49	United States of America	1/8/2014 7:33 PM
50	Usa	1/8/2014 7:19 PM
51	United States	1/8/2014 6:30 PM
52	USA	1/8/2014 6:07 PM
53	us	1/8/2014 5:59 PM
54	USA	1/8/2014 5:58 PM
55	usa	1/8/2014 5:43 PM
56	Usa	1/8/2014 5:31 PM
57	USA	1/8/2014 5:30 PM
58	United States	1/8/2014 5:23 PM
59	USA	1/8/2014 5:22 PM
60	USA	1/8/2014 4:45 PM
61	USA	1/8/2014 4:30 PM
62	USA	1/8/2014 4:29 PM
63	USA	1/8/2014 4:20 PM
64	USA	1/8/2014 4:19 PM
65	USA	1/8/2014 4:13 PM
66	United state	1/8/2014 4:11 PM
67	United States	1/8/2014 4:04 PM
68	USA	1/8/2014 3:46 PM
69	USA	1/8/2014 3:43 PM
70	USA	1/8/2014 3:41 PM
71	USA	1/8/2014 3:34 PM
72	USA	1/8/2014 3:31 PM
73	USA	1/8/2014 3:25 PM
74	U.S.A.	1/8/2014 3:17 PM

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

75	United States	1/8/2014 3:15 PM
76	United States	1/8/2014 3:01 PM
77	usa	1/8/2014 2:40 PM
78	United States of America	1/8/2014 2:26 PM
79	United States	1/8/2014 1:07 PM
80	US	1/8/2014 12:28 PM
81	United States	1/8/2014 12:13 PM
82	US	1/8/2014 11:34 AM
83	Germany	1/8/2014 11:18 AM
84	USA	1/8/2014 10:25 AM
85	USA	1/8/2014 10:15 AM
86	Us	1/8/2014 10:04 AM
87	USA	1/8/2014 9:31 AM
88	US	1/8/2014 9:13 AM
89	US	1/8/2014 9:07 AM
90	U. S. A.	1/8/2014 9:05 AM
91	USA	1/8/2014 9:03 AM
92	USA	1/8/2014 9:01 AM
93	USA	1/8/2014 8:28 AM
94	USA	1/8/2014 8:16 AM
95	US	1/8/2014 8:03 AM
96	United States	1/8/2014 7:48 AM
97	Canada	1/8/2014 7:43 AM
98	US	1/8/2014 7:07 AM
99	USA	1/8/2014 6:56 AM
100	USA	1/8/2014 6:45 AM
101	USA	1/8/2014 6:00 AM
102	usa	1/8/2014 5:55 AM
103	Los Angeles	1/8/2014 5:50 AM
104	U S A	1/8/2014 5:11 AM
105	usa	1/8/2014 4:48 AM
106	USA	1/7/2014 4:39 AM
107	USA	1/6/2014 12:05 PM
108	USA	1/6/2014 9:15 AM
109	USA	1/6/2014 8:21 AM
110	United States	1/6/2014 7:34 AM
111	USA	1/6/2014 5:30 AM
112	United States	1/5/2014 9:35 PM
113	USA	1/5/2014 9:21 PM
114	USA	1/5/2014 7:51 PM

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The Role of Water Features in A Modern World

115	USA	1/5/2014 6:36 PM
116	America	1/5/2014 5:54 PM
117	USA	1/5/2014 5:42 PM
118	USA	1/5/2014 4:39 PM
119	USA	1/5/2014 4:16 PM
120	USA	1/5/2014 3:25 PM
121	USA	1/5/2014 2:13 PM
122	USA	1/5/2014 1:27 PM
123	germany	1/5/2014 1:03 PM
124	US	1/5/2014 1:02 PM
125	United States of America	1/5/2014 12:36 PM
126	USA	1/2/2014 3:39 PM
127	Japan	1/2/2014 3:15 AM
128	USA	12/26/2013 8:06 AM
129	USA	12/23/2013 4:23 PM
130	U S A	12/23/2013 7:15 AM
131	USA	12/22/2013 10:29 AM
132	United States	12/22/2013 8:22 AM
133	India	12/22/2013 7:35 AM
134	United States	12/21/2013 6:58 PM
135	United States	12/21/2013 1:20 PM
136	United States	12/21/2013 1:08 PM
137	USA	12/21/2013 12:30 PM
138	us	12/20/2013 6:36 AM
139	United States	12/19/2013 6:18 PM
140	USA	12/19/2013 5:25 PM
141	u.s.	12/19/2013 4:41 PM
142	Sweden	12/19/2013 3:29 PM
143	United States	12/19/2013 3:10 PM
144	United States	12/19/2013 12:29 AM
145	USA	12/18/2013 11:04 PM
146	USA	12/18/2013 8:16 PM
147	USA	12/18/2013 8:11 PM
148	USA	12/18/2013 6:22 PM
149	United States	12/18/2013 6:12 PM
150	United States	12/18/2013 5:27 PM
151	USA	12/18/2013 4:32 PM
152	United States	12/18/2013 4:21 PM
153	usa	12/18/2013 2:56 PM
154	USA	12/18/2013 2:19 PM

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

155	USA	12/18/2013 2:15 PM
156	USA	12/18/2013 2:03 PM
157	United States	12/18/2013 1:44 PM
158	United States	12/18/2013 12:25 PM
159	United States	12/18/2013 11:51 AM
160	USA	12/18/2013 11:49 AM
161	USA	12/18/2013 11:47 AM
162	USA	12/18/2013 11:37 AM
163	USA	12/18/2013 11:24 AM
164	U.S.A	12/18/2013 11:23 AM
165	United States	12/18/2013 11:16 AM
166	America	12/18/2013 11:11 AM
167	United States of America	12/18/2013 11:09 AM
168	USA	12/18/2013 11:03 AM
169	United States	12/18/2013 11:02 AM
170	Italy	12/18/2013 10:56 AM
171	USA	12/18/2013 10:54 AM
172	United States	12/18/2013 10:47 AM
173	US	12/18/2013 10:43 AM
174	United States	12/18/2013 10:42 AM
175	USA	12/18/2013 10:40 AM
176	United States of America	12/18/2013 10:35 AM
177	United States	12/18/2013 10:35 AM
178	US	12/18/2013 10:32 AM
179	USA	12/18/2013 10:32 AM
180	USA	12/18/2013 8:39 AM
181	Mexico	12/17/2013 4:24 PM
182	US	12/17/2013 2:43 PM
183	USA	12/17/2013 12:48 PM
184	USA	12/17/2013 11:20 AM
185	United States	12/17/2013 9:38 AM
186	United States	12/17/2013 8:22 AM
187	USA	12/17/2013 8:13 AM
188	USA	12/17/2013 6:11 AM
189	United States	12/16/2013 10:28 PM
190	United States	12/16/2013 9:51 PM
191	usa	12/16/2013 9:37 PM
192	U.S.	12/16/2013 9:13 PM
193	United States	12/16/2013 8:34 PM
194	Mexico	12/16/2013 8:27 PM

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

195	US	12/16/2013 8:26 PM
196	U.S.	12/16/2013 8:10 PM
197	USA	12/16/2013 7:38 PM
198	United States of America	12/16/2013 7:01 PM
199	usa	12/16/2013 6:16 PM
200	USA	12/16/2013 6:00 PM
201	USA	12/16/2013 5:59 PM
202	USA	12/16/2013 5:18 PM
203	USA	12/16/2013 5:04 PM
204	USA	12/16/2013 4:23 PM
205	usa	12/16/2013 4:17 PM
206	USA	12/16/2013 4:10 PM
207	united states	12/16/2013 3:40 PM
208	Uk	12/16/2013 3:28 PM
209	United States	12/16/2013 2:52 PM
210	Usa	12/16/2013 2:41 PM
211	US	12/16/2013 2:33 PM
212	USA	12/16/2013 1:30 PM
213	United States	12/16/2013 1:06 PM
214	USA	12/16/2013 12:41 PM
215	US	12/16/2013 11:55 AM
216	USA	12/16/2013 11:48 AM
217	u.s.	12/16/2013 11:40 AM
218	USA	12/16/2013 11:36 AM
219	United States	12/16/2013 11:21 AM
220	United States	12/16/2013 10:54 AM
221	US	12/16/2013 10:28 AM
222	usa	12/16/2013 10:25 AM
223	USA	12/16/2013 10:14 AM
224	USA	12/16/2013 10:08 AM
225	USA	12/16/2013 10:03 AM
226	USA	12/16/2013 10:00 AM
227	USA	12/16/2013 9:38 AM
228	USA	12/16/2013 9:31 AM
229	US	12/16/2013 9:12 AM
230	USA	12/16/2013 8:36 AM
231	United States	12/16/2013 8:26 AM
232	USA	12/16/2013 8:05 AM
233	USA	12/16/2013 8:00 AM
234	United states	12/16/2013 7:44 AM

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235	USA	12/16/2013 7:34 AM
236	United States	12/16/2013 6:53 AM
237	USA	12/16/2013 6:53 AM
238	USA	12/16/2013 6:44 AM
239	USA	12/16/2013 6:43 AM
240	US	12/16/2013 6:37 AM
241	England, UK	12/16/2013 5:17 AM
242	USA	12/16/2013 4:39 AM

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q5 Please indicate the State or Province that you live within

Answered: 242 Skipped: 1

#	Responses	Date
1	CA	1/15/2014 3:04 PM
2	CALIFORNIA	1/15/2014 12:12 PM
3	CALIFORNIA	1/12/2014 2:32 PM
4	PA	1/12/2014 4:38 AM
5	Califomia	1/11/2014 9:19 PM
6	CA	1/11/2014 6:12 PM
7	MN	1/11/2014 3:54 PM
8	MN	1/11/2014 2:14 PM
9	CA and MN	1/11/2014 11:52 AM
10	Paris and califomia	1/11/2014 12:33 AM
11	Califomia	1/10/2014 11:10 PM
12	CA	1/10/2014 4:55 PM
13	California	1/10/2014 3:40 PM
14	ca	1/10/2014 3:36 PM
15	CA.	1/10/2014 12:45 PM
16	California	1/10/2014 9:36 AM
17	CA	1/10/2014 8:30 AM
18	Ca	1/10/2014 8:19 AM
19	WI	1/10/2014 7:30 AM
20	CA	1/9/2014 8:48 PM
21	CALIFORNIA	1/9/2014 8:42 PM
22	Texas	1/9/2014 7:58 PM
23	ca	1/9/2014 7:41 PM
24	California	1/9/2014 5:12 PM
25	California	1/9/2014 4:57 PM
26	CA	1/9/2014 4:53 PM
27	BC	1/9/2014 4:30 PM
28	California	1/9/2014 4:20 PM
29	CA	1/9/2014 4:18 PM
30	CA	1/9/2014 3:53 PM
31	California	1/9/2014 3:38 PM
32	California	1/9/2014 3:36 PM
33	BC & California	1/9/2014 3:28 PM
34	CA	1/9/2014 3:22 PM

1 / 7

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

35	CA	1/9/2014 3:20 PM
36	CA	1/9/2014 3:13 PM
37	CA	1/9/2014 3:07 PM
38	California	1/9/2014 2:52 PM
39	Oregon	1/9/2014 2:12 PM
40	mostly Calif., north and south. Summers in downtown Seattle.	1/9/2014 11:00 AM
41	CA	1/9/2014 10:58 AM
42	CA	1/9/2014 7:20 AM
43	California	1/9/2014 7:02 AM
44	Texas	1/9/2014 3:04 AM
45	California	1/8/2014 9:39 PM
46	Washington	1/8/2014 9:14 PM
47	CA	1/8/2014 8:03 PM
48	Utah	1/8/2014 7:46 PM
49	California	1/8/2014 7:33 PM
50	Ca	1/8/2014 7:19 PM
51	California	1/8/2014 6:30 PM
52	CA	1/8/2014 6:07 PM
53	ca	1/8/2014 5:59 PM
54	CA	1/8/2014 5:58 PM
55	ca	1/8/2014 5:43 PM
56	California that works good	1/8/2014 5:31 PM
57	CA	1/8/2014 5:30 PM
58	California	1/8/2014 5:23 PM
59	CA	1/8/2014 5:22 PM
60	CALIFORNIA	1/8/2014 4:45 PM
61	CA	1/8/2014 4:30 PM
62	CA	1/8/2014 4:29 PM
63	CALIFORNIA	1/8/2014 4:20 PM
64	California	1/8/2014 4:19 PM
65	California	1/8/2014 4:13 PM
66	California	1/8/2014 4:11 PM
67	California	1/8/2014 4:04 PM
68	County-Riverside State-California	1/8/2014 3:46 PM
69	CA	1/8/2014 3:43 PM
70	CA	1/8/2014 3:41 PM
71	CA	1/8/2014 3:34 PM
72	WA	1/8/2014 3:31 PM
73	CA	1/8/2014 3:25 PM
74	California	1/8/2014 3:17 PM

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

75	California	1/8/2014 3:15 PM
76	California	1/8/2014 3:01 PM
77	california	1/8/2014 2:40 PM
78	California	1/8/2014 2:26 PM
79	California	1/8/2014 1:07 PM
80	CA	1/8/2014 12:28 PM
81	Idaho	1/8/2014 12:13 PM
82	VA	1/8/2014 11:34 AM
83	Berlin	1/8/2014 11:18 AM
84	California	1/8/2014 10:25 AM
85	California	1/8/2014 10:15 AM
86	Ca	1/8/2014 10:04 AM
87	USA	1/8/2014 10:02 AM
88	California	1/8/2014 9:31 AM
89	Montana	1/8/2014 9:13 AM
90	CA/MI	1/8/2014 9:07 AM
91	California	1/8/2014 9:05 AM
92	Washington	1/8/2014 9:03 AM
93	ID	1/8/2014 9:01 AM
94	California	1/8/2014 8:28 AM
95	TX	1/8/2014 8:16 AM
96	WA	1/8/2014 8:03 AM
97	California	1/8/2014 7:48 AM
98	British Columbia	1/8/2014 7:43 AM
99	California	1/8/2014 7:07 AM
100	Minnesota	1/8/2014 6:56 AM
101	WA	1/8/2014 6:45 AM
102	CA	1/8/2014 6:00 AM
103	ca	1/8/2014 5:55 AM
104	California	1/8/2014 5:50 AM
105	Texas	1/8/2014 5:11 AM
106	illinois	1/8/2014 4:48 AM
107	MA	1/7/2014 4:39 AM
108	Massachusetts	1/6/2014 12:05 PM
109	DC	1/6/2014 9:15 AM
110	Colorado	1/6/2014 8:21 AM
111	Michigan	1/6/2014 7:34 AM
112	Massachusetts	1/6/2014 5:30 AM
113	New Hampshire	1/5/2014 9:35 PM
114	Maryland	1/5/2014 9:21 PM

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The Role of Water Features in A Modern World

115	Maine	1/5/2014 7:51 PM
116	WI	1/5/2014 6:36 PM
117	Massachusetts	1/5/2014 5:54 PM
118	Massachusetts	1/5/2014 5:42 PM
119	Maine	1/5/2014 4:39 PM
120	Washington DC	1/5/2014 4:16 PM
121	Maine	1/5/2014 3:25 PM
122	Washington	1/5/2014 2:13 PM
123	Maryland	1/5/2014 1:27 PM
124	saxony	1/5/2014 1:03 PM
125	NH	1/5/2014 1:02 PM
126	MA	1/5/2014 12:36 PM
127	Missouri	1/2/2014 3:39 PM
128	Tokyo	1/2/2014 3:15 AM
129	North Carolina	12/26/2013 8:06 AM
130	Califomia	12/23/2013 4:23 PM
131	VA.	12/23/2013 7:15 AM
132	Ca	12/22/2013 10:29 AM
133	Ca	12/22/2013 8:22 AM
134	Maharashtra	12/22/2013 7:35 AM
135	Califomia	12/21/2013 6:58 PM
136	Califomia	12/21/2013 1:20 PM
137	Califomia	12/21/2013 1:08 PM
138	Califomia	12/21/2013 12:30 PM
139	new jersey	12/20/2013 6:36 AM
140	Califomia	12/19/2013 6:18 PM
141	Califomia	12/19/2013 5:25 PM
142	cal	12/19/2013 4:41 PM
143	Holland	12/19/2013 3:29 PM
144	Califomia	12/19/2013 3:10 PM
145	Califomia	12/19/2013 12:29 AM
146	Califomia	12/18/2013 11:04 PM
147	CA	12/18/2013 8:16 PM
148	CA	12/18/2013 8:11 PM
149	CA	12/18/2013 6:22 PM
150	Cali	12/18/2013 6:12 PM
151	AZ.	12/18/2013 5:27 PM
152	Colorado	12/18/2013 4:32 PM
153	Califomia	12/18/2013 4:21 PM
154	califomia	12/18/2013 2:56 PM

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

155	California	12/18/2013 2:19 PM
156	CA	12/18/2013 2:15 PM
157	AL	12/18/2013 2:03 PM
158	CA	12/18/2013 1:44 PM
159	California	12/18/2013 12:25 PM
160	Texas	12/18/2013 11:51 AM
161	CA	12/18/2013 11:49 AM
162	CA	12/18/2013 11:47 AM
163	CA	12/18/2013 11:37 AM
164	CALIFORNIA	12/18/2013 11:24 AM
165	California	12/18/2013 11:23 AM
166	California	12/18/2013 11:16 AM
167	California	12/18/2013 11:11 AM
168	Colorado	12/18/2013 11:09 AM
169	California	12/18/2013 11:03 AM
170	Oregon	12/18/2013 11:02 AM
171	Fruili-Giulia	12/18/2013 10:56 AM
172	CA	12/18/2013 10:54 AM
173	California	12/18/2013 10:47 AM
174	CA	12/18/2013 10:43 AM
175	California	12/18/2013 10:42 AM
176	CA	12/18/2013 10:40 AM
177	California	12/18/2013 10:35 AM
178	California	12/18/2013 10:35 AM
179	CA	12/18/2013 10:32 AM
180	CA	12/18/2013 10:32 AM
181	California	12/18/2013 8:39 AM
182	Estado de Mexico	12/17/2013 4:24 PM
183	Washington DC	12/17/2013 2:43 PM
184	New York	12/17/2013 12:48 PM
185	MA	12/17/2013 11:20 AM
186	NC	12/17/2013 9:38 AM
187	New York	12/17/2013 8:22 AM
188	Virginia	12/17/2013 8:13 AM
189	Maine	12/17/2013 6:11 AM
190	California	12/16/2013 10:28 PM
191	California	12/16/2013 9:51 PM
192	california	12/16/2013 9:37 PM
193	CALIFORNIA	12/16/2013 9:13 PM
194	Idaho	12/16/2013 8:34 PM

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

195	DF	12/16/2013 8:27 PM
196	Va	12/16/2013 8:26 PM
197	Virginia	12/16/2013 8:10 PM
198	VA	12/16/2013 7:38 PM
199	Idaho	12/16/2013 7:01 PM
200	ca	12/16/2013 6:16 PM
201	Califomia	12/16/2013 6:00 PM
202	CA	12/16/2013 5:59 PM
203	NY	12/16/2013 5:18 PM
204	Virginia	12/16/2013 5:04 PM
205	Virginia	12/16/2013 4:23 PM
206	hawaii	12/16/2013 4:17 PM
207	Va.	12/16/2013 4:10 PM
208	Virginia	12/16/2013 3:40 PM
209	Cambs	12/16/2013 3:28 PM
210	Virginia	12/16/2013 2:52 PM
211	Idaho	12/16/2013 2:41 PM
212	HI	12/16/2013 2:33 PM
213	California	12/16/2013 1:30 PM
214	Minnesota	12/16/2013 1:06 PM
215	VA	12/16/2013 12:41 PM
216	Hawai	12/16/2013 11:55 AM
217	Hawaii	12/16/2013 11:48 AM
218	hawaii	12/16/2013 11:40 AM
219	ARIZONA	12/16/2013 11:36 AM
220	Hawaii	12/16/2013 11:21 AM
221	California	12/16/2013 10:54 AM
222	VA	12/16/2013 10:28 AM
223	hi	12/16/2013 10:25 AM
224	Hawaii	12/16/2013 10:14 AM
225	Califomial	12/16/2013 10:08 AM
226	Hawaii	12/16/2013 10:03 AM
227	Idaho	12/16/2013 10:00 AM
228	Hawaii	12/16/2013 9:38 AM
229	Illinois	12/16/2013 9:31 AM
230	WA	12/16/2013 9:12 AM
231	California	12/16/2013 8:36 AM
232	Massachusetts	12/16/2013 8:26 AM
233	CA	12/16/2013 8:05 AM
234	Ca	12/16/2013 8:00 AM

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

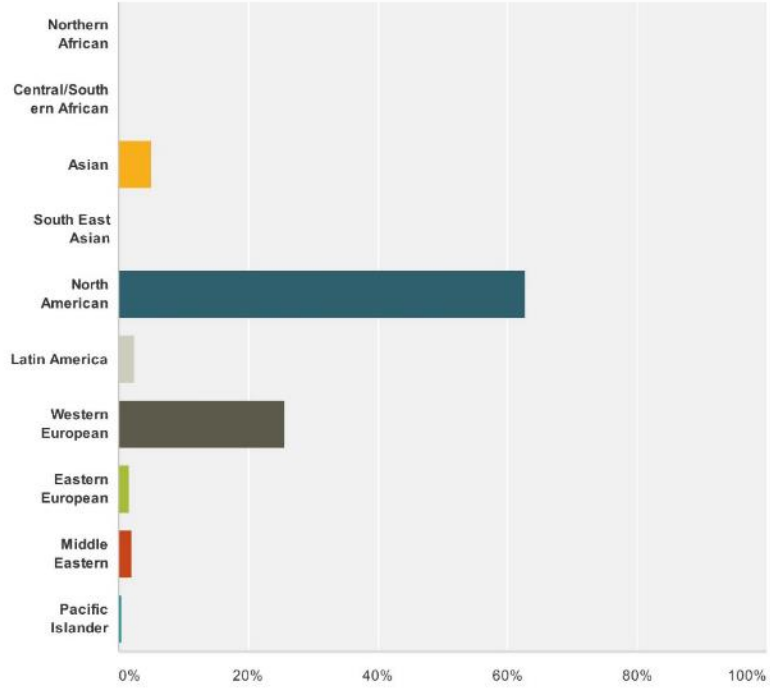
235	Massachusetts	12/16/2013 7:44 AM
236	Idaho	12/16/2013 7:34 AM
237	New York	12/16/2013 6:53 AM
238	CALLIFORNIA	12/16/2013 6:53 AM
239	MA	12/16/2013 6:44 AM
240	Massachusetts	12/16/2013 6:43 AM
241	London	12/16/2013 5:17 AM
242	CA	12/16/2013 4:39 AM

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q6 With what cultural group do you most identify with?

Answered: 241 Skipped: 2



Answer Choices	Responses
Northern African	0% 0
Central/Southern African	0% 0
Asian	4.98% 12
South East Asian	0% 0
North American	62.66% 151
Latin America	2.49% 6
Western European	25.73% 62
Eastern European	1.66% 4
Middle Eastern	2.07% 5
Pacific Islander	0.41% 1

The Role of Water Features in A Modern World

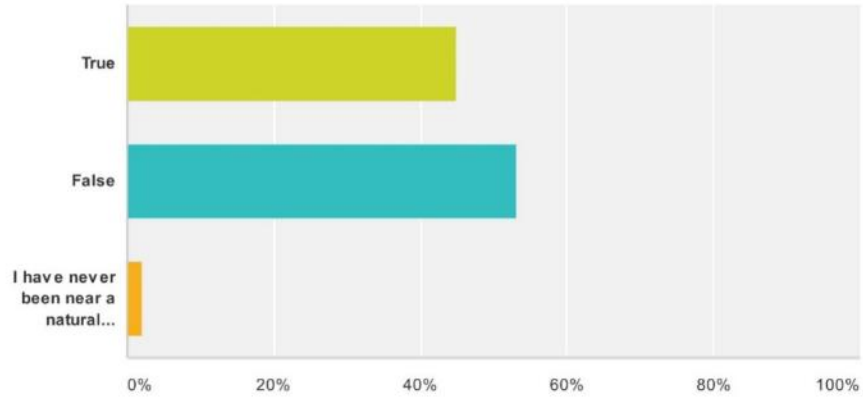
Total	241
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Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q7 When I sit next to a large outdoor water fountain I experience similar feelings as I do when I am near a natural waterfall?

Answered: 243 Skipped: 0



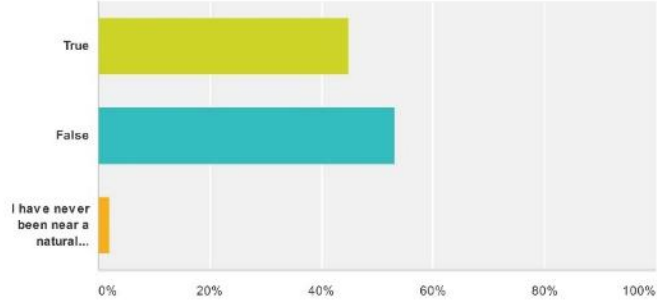
Answer Choices	Responses	
True	44.86%	109
False	53.09%	129
I have never been near a natural waterfall	2.06%	5
Total		243

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q7 When I sit next to a large outdoor water fountain I experience similar feelings as I do when I am near a natural waterfall?

Answered: 243 Skipped: 0

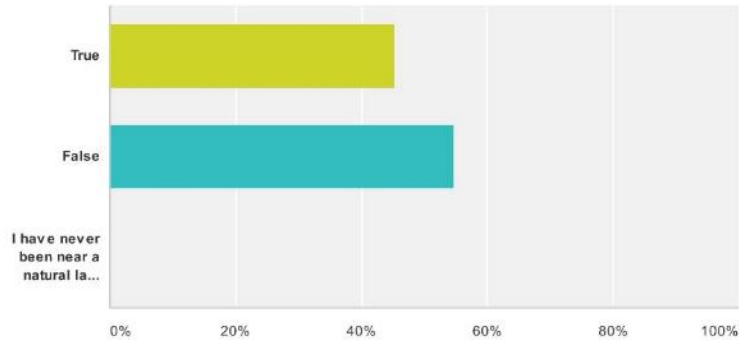


Answer Choices	Responses	Count
True	44.86%	109
False	53.09%	129
I have never been near a natural waterfall	2.06%	5
Total		243

The Role of Water Features in A Modern World

Q8 When I sit next to an outdoor fishpond I experience similar feelings as I do when sitting near a lake or natural pond?

Answered: 243 Skipped: 0



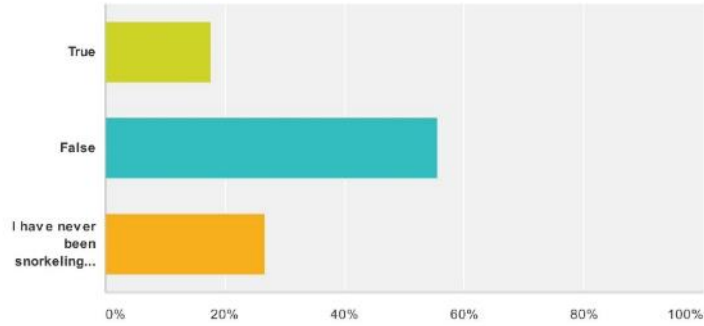
Answer Choices	Responses	Count
True	45.27%	110
False	54.73%	133
I have never been near a natural lake or pond	0%	0
Total		243

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q9 When I sit next to a large aquarium I experience similar feelings as I do when snorkeling or scuba diving.

Answered: 243 Skipped: 0

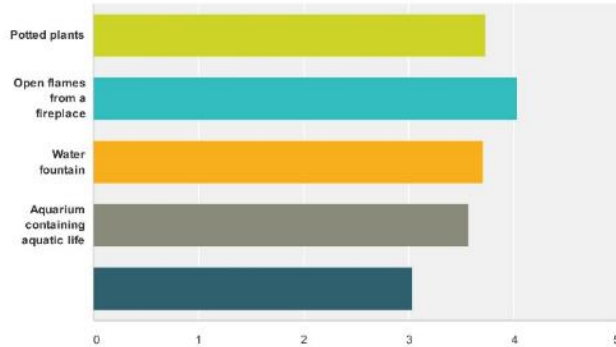


Answer Choices	Responses
True	17.70% 43
False	55.56% 135
I have never been snorkeling or scuba diving	26.75% 65
Total	243

The Role of Water Features in A Modern World

Q10 When I am indoors, I feel the most connected to nature when near:

Answered: 242 Skipped: 1



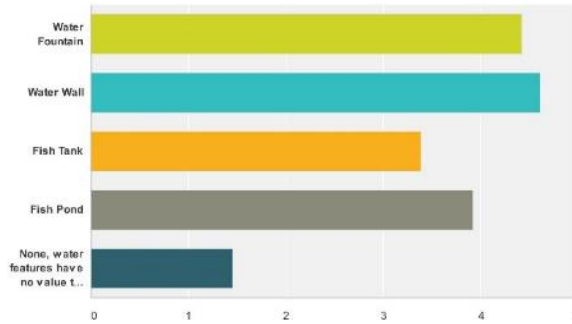
	0	1	2	3	4	5	Total	Average Rating
Potted plants	7.56% 16	15.13% 36	18.07% 43	28.57% 68	17.23% 41	13.45% 32	236	3.73
Open flames from a fireplace	7.11% 17	11.30% 27	17.99% 43	17.57% 42	27.62% 66	18.41% 44	239	4.03
Water fountain	8.55% 20	9.40% 22	23.93% 56	29.49% 69	17.95% 42	10.68% 25	234	3.71
Aquarium containing aquatic life	10.26% 24	11.97% 28	26.07% 61	21.79% 51	22.22% 52	7.69% 18	234	3.57
Artwork depicting nature scenes	17.01% 41	20.75% 50	25.31% 61	19.50% 47	12.86% 31	4.56% 11	241	3.04

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q11 When I am in a public space I prefer to experience a:

Answered: 243 Skipped: 0

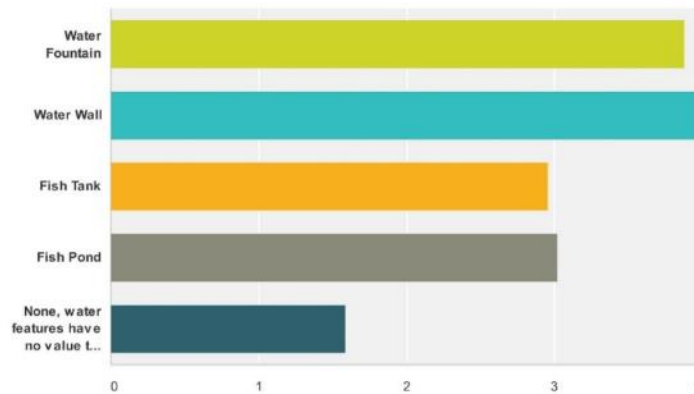


	0	1	2	3	4	5	Total	Average Rating
Water Fountain	3.43% (8)	7.73% (18)	11.16% (26)	23.61% (55)	29.61% (69)	24.46% (57)	233	4.42
Water Wall	2.13% (5)	3.83% (9)	10.21% (24)	22.55% (53)	37.02% (87)	24.26% (57)	235	4.61
Fish Tank	12.93% (30)	14.66% (34)	22.84% (53)	28.45% (66)	12.50% (29)	8.62% (20)	232	3.39
Fish Pond	6.47% (15)	9.48% (22)	18.53% (43)	30.60% (71)	21.12% (49)	13.79% (32)	232	3.92
None, water features have no value to me	81.71% (134)	6.10% (10)	4.88% (8)	3.05% (5)	1.83% (3)	2.44% (4)	164	1.45

The Role of Water Features in A Modern World

Q12 In my home, I would prefer to have a:

Answered: 243 Skipped: 0



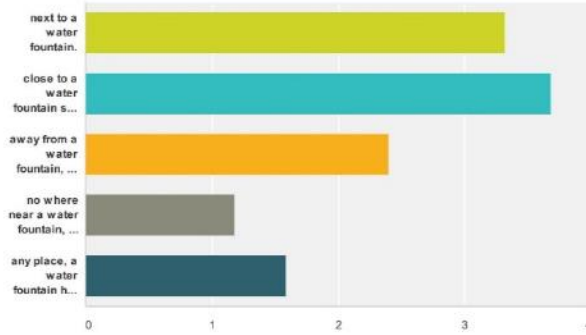
	0	1	2	3	4	5	Total	Average Rating
Water Fountain	15.11% (34)	10.67% (24)	13.33% (30)	14.22% (32)	24.89% (56)	21.78% (49)	225	3.88
Water Wall	11.56% (26)	12.44% (28)	11.56% (26)	16.44% (37)	24.89% (56)	23.11% (52)	225	4.00
Fish Tank	27.73% (61)	18.18% (40)	16.82% (37)	15% (33)	12.27% (27)	10% (22)	220	2.96
Fish Pond	28.70% (62)	14.35% (31)	17.13% (37)	18.52% (40)	8.33% (18)	12.96% (28)	216	3.02
None, water features have no value to me	79.62% (125)	8.28% (13)	1.91% (3)	0.64% (1)	2.55% (4)	7.01% (11)	157	1.59

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q13 When I want to rest or wait in a hotel lobby, airport, or mall I prefer to sit:

Answered: 240 Skipped: 3

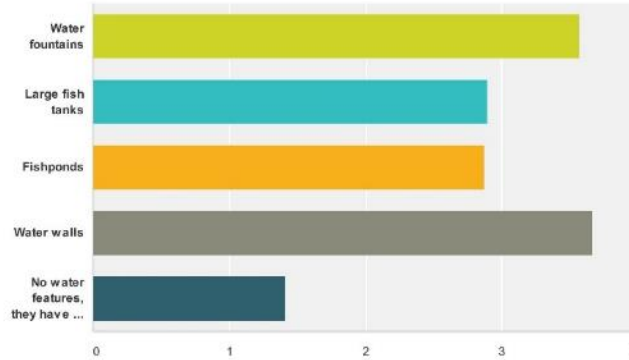


	1	2	3	4	5	Total	Average Rating
next to a water fountain.	11.06% 24	13.82% 30	26.73% 58	29.03% 63	19.35% 42	217	3.32
close to a water fountain so that I can see and hear it.	8.11% 18	8.56% 19	19.82% 44	34.23% 76	29.28% 65	222	3.68
away from a water fountain, but I still want to see it.	22.96% 48	34.76% 73	25.71% 54	13.33% 28	3.33% 7	210	2.40
no where near a water fountain, I don't like them.	87% 174	9% 18	3% 6	1% 2	0% 0	200	1.18
any place, a water fountain has no meaning to me.	72.64% 146	12.94% 26	4.98% 10	1.99% 4	7.46% 15	201	1.59

The Role of Water Features in A Modern World

Q14 I prefer restaurants, hotel lobbies, airports, or malls that have:

Answered: 240 Skipped: 3



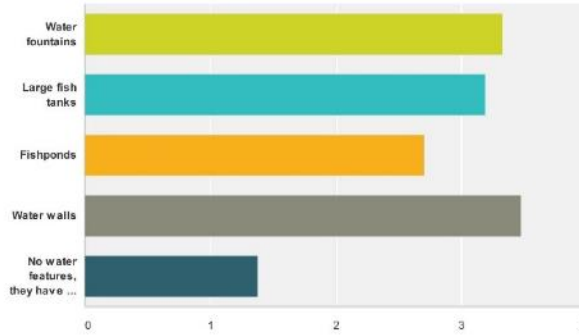
	1	2	3	4	5	Total	Average Rating
Water fountains	8.44% 19	14.22% 32	18.22% 41	30.22% 68	28.89% 65	225	3.57
Large fish tanks	18.08% 39	21.30% 46	26.85% 58	21.30% 46	12.50% 27	216	2.89
Fishponds	20.37% 44	19.44% 42	26.85% 58	19.44% 42	13.89% 30	216	2.87
Water walls	8.14% 18	9.50% 21	19.91% 44	33.03% 73	29.41% 65	221	3.66
No water features, they have no meaning for me	84.66% 160	4.76% 9	2.65% 5	1.06% 2	6.88% 13	189	1.41

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q15 I prefer a hospital lobby or waiting area to have:

Answered: 241 Skipped: 2

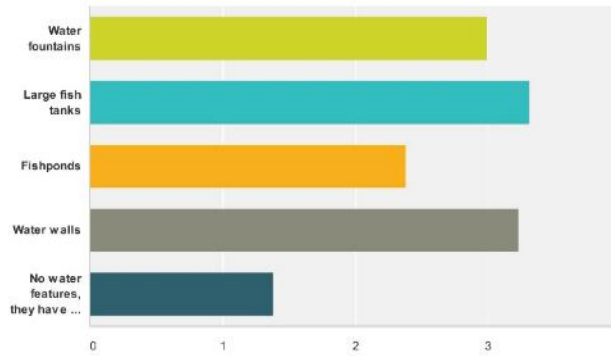


	1	2	3	4	5	Total	Average Rating
Water fountains	12.22% 27	17.65% 39	17.19% 38	30.77% 68	22.17% 49	221	3.33
Large fish tanks	16.36% 35	15.89% 34	22.90% 49	22.43% 48	22.43% 48	214	3.19
Fishponds	26.19% 55	21.43% 45	21.43% 45	18.57% 39	12.30% 26	210	2.70
Water walls	10.60% 23	14.29% 31	19.35% 42	28.57% 62	27.19% 59	217	3.47
No water features, they have no meaning for me	86.46% 166	2.60% 5	3.65% 7	1.04% 2	6.25% 12	192	1.38

The Role of Water Features in A Modern World

Q16 I prefer my physician's, dentist's, or counselor's office to have:

Answered: 241 Skipped: 2



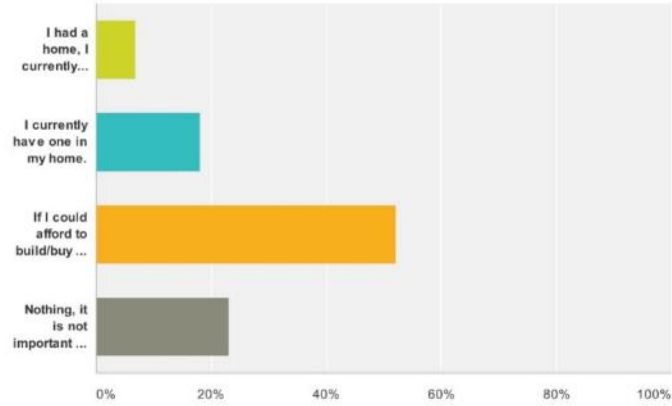
	1	2	3	4	5	Total	Average Rating
Water fountains	18.60% 40	21.40% 46	19.53% 42	23.72% 51	16.74% 36	215	2.99
Large fish tanks	16.74% 36	14.42% 31	16.74% 36	25.12% 54	26.98% 58	215	3.31
Fishponds	34.63% 71	24.39% 50	18.05% 37	14.63% 30	8.29% 17	205	2.38
Water walls	16.67% 35	15.71% 33	18.10% 38	27.14% 57	22.38% 47	210	3.23
No water features, they have no meaning for me	85.86% 164	4.19% 8	2.09% 4	1.57% 3	6.28% 12	191	1.38

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q17 I would have a water feature (fountain, aquarium, or pond) in my home if:

Answered: 238 Skipped: 5

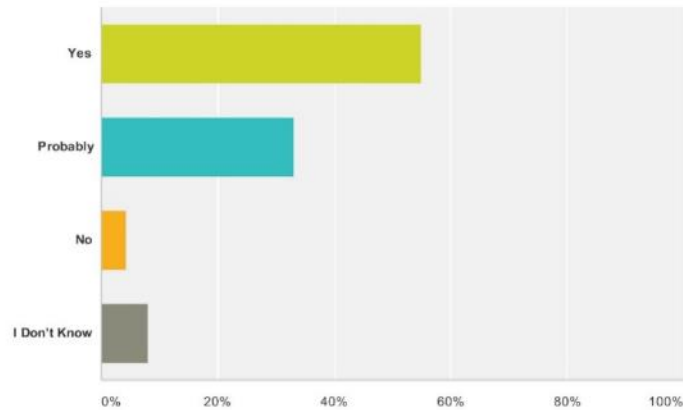


Answer Choices	Responses
I had a home, I currently live with my parents, friends, or in a dorm.	6.72% 16
I currently have one in my home.	18.07% 43
If I could afford to build/buy and maintain one.	52.10% 124
Nothing, it is not important for me to have a water feature in my home.	23.11% 55
Total	238

The Role of Water Features in A Modern World

Q18 Do you think indoor water fountains have the ability to lower stress?

Answered: 239 Skipped: 4



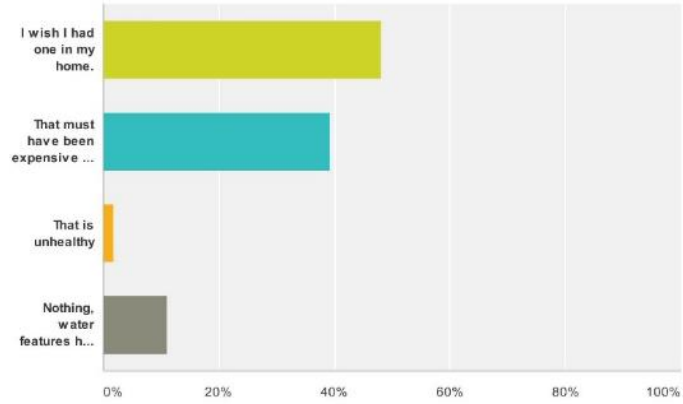
Answer Choices	Responses
Yes	54.81% 131
Probably	33.05% 79
No	4.18% 10
I Don't Know	7.95% 19
Total	239

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q19 When I go into another person's home and I see a water feature (fountain, aquarium, or pond) I tend to think:

Answered: 227 Skipped: 16



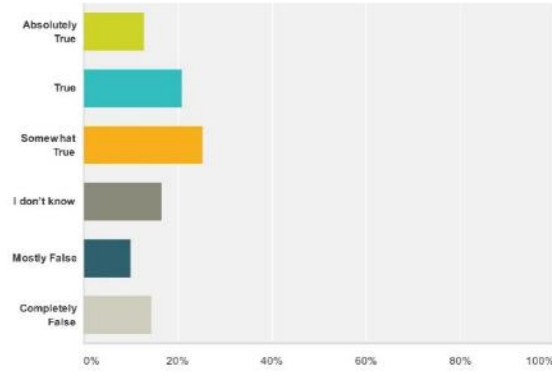
Answer Choices	Responses	Count
I wish I had one in my home.	48.02%	109
That must have been expensive to build/buy and maintain.	39.21%	89
That is unhealthy	1.76%	4
Nothing, water features have no meaning to me.	11.01%	25
Total		227

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q20 If my physician or dentist has a water feature (fountain, aquarium, or pond) in their office waiting room I regard him or her more favorably?

Answered: 241 Skipped: 2

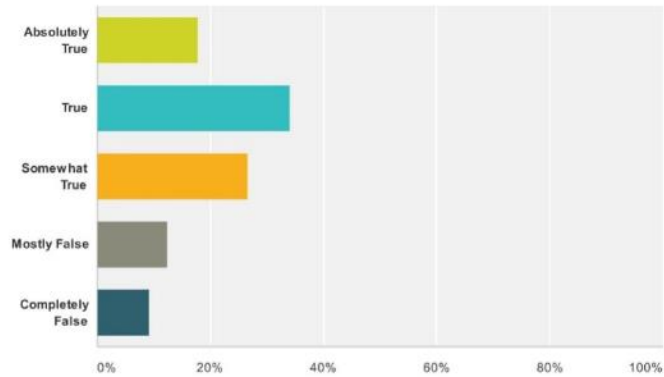


Answer Choices	Responses	Count
Absolutely True	12.86%	31
True	20.75%	50
Somewhat True	25.31%	61
I don't know	16.60%	40
Mostly False	9.96%	24
Completely False	14.52%	35
Total		241

The Role of Water Features in A Modern World

Q21 Fish tanks in my physician, dentist, or counselor's office waiting rooms have a calming effect for me.

Answered: 241 Skipped: 2



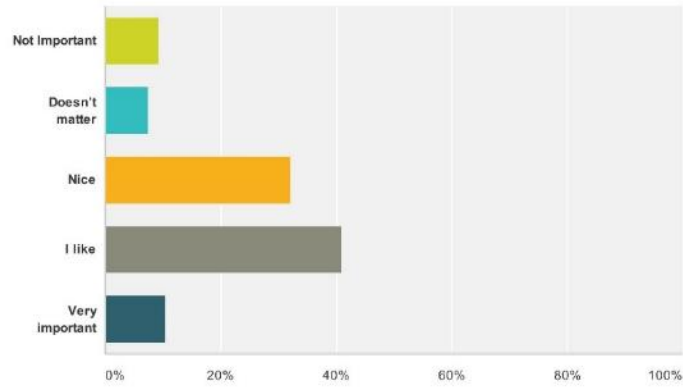
Answer Choices	Responses	Count
Absolutely True	17.84%	43
True	34.02%	82
Somewhat True	26.56%	64
Mostly False	12.45%	30
Completely False	9.13%	22
Total		241

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q22 Water features within public interior environments are important to me.

Answered: 240 Skipped: 3

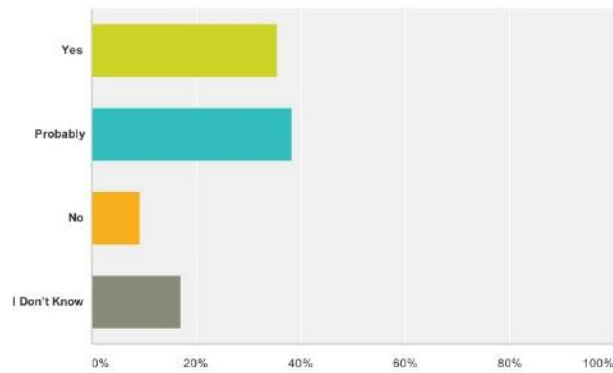


Answer Choices	Responses	Count
Not Important	9.17%	22
Doesn't matter	7.50%	18
Nice	32.08%	77
I like	40.83%	98
Very important	10.42%	25
Total		240

The Role of Water Features in A Modern World

Q23 Do you think indoor fishponds have the ability to lower stress?

Answered: 240 Skipped: 3



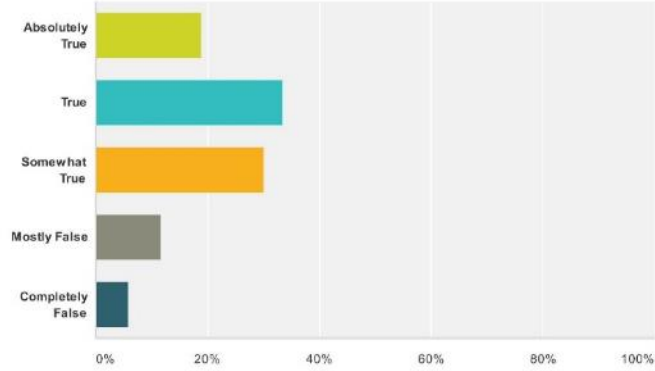
Answer Choices	Responses	Count
Yes	35.42%	85
Probably	38.33%	92
No	9.17%	22
I Don't Know	17.08%	41
Total		240

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q24 When I watch a water feature (fountain or fish tank) in a physician, dentist, or counselor's office I feel more relaxed?

Answered: 239 Skipped: 4

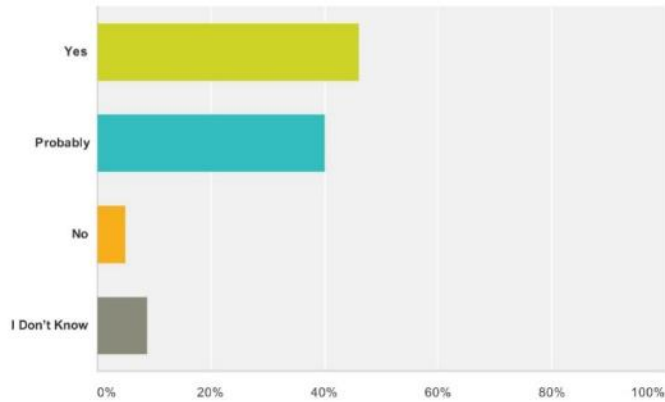


Answer Choices	Responses	Count
Absolutely True	18.83%	45
True	33.47%	80
Somewhat True	30.13%	72
Mostly False	11.72%	28
Completely False	5.86%	14
Total		239

The Role of Water Features in A Modern World

Q25 Do you think indoor water walls have the ability to lower stress?

Answered: 239 Skipped: 4



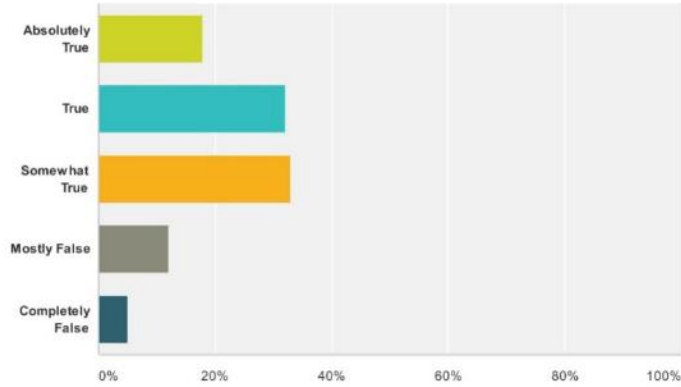
Answer Choices	Responses	Count
Yes	46.03%	110
Probably	40.17%	96
No	5.02%	12
I Don't Know	8.79%	21
Total		239

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q26 I find the audio recorded sound of moving or falling water to be relaxing.

Answered: 240 Skipped: 3

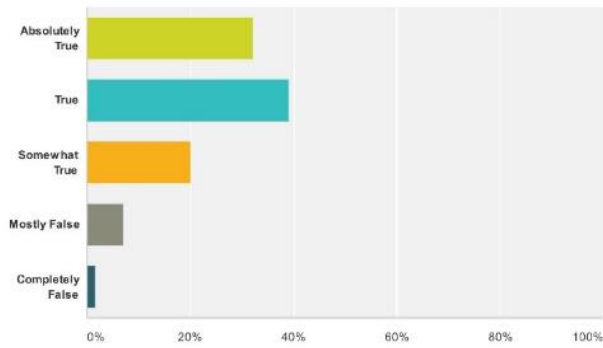


Answer Choices	Responses
Absolutely True	17.92% 43
True	32.08% 77
Somewhat True	32.92% 79
Mostly False	12.08% 29
Completely False	5% 12
Total	240

The Role of Water Features in A Modern World

Q27 I find that it is the combination of the sound of water moving along with the visual movement of water to be most relaxing.

Answered: 240 Skipped: 3



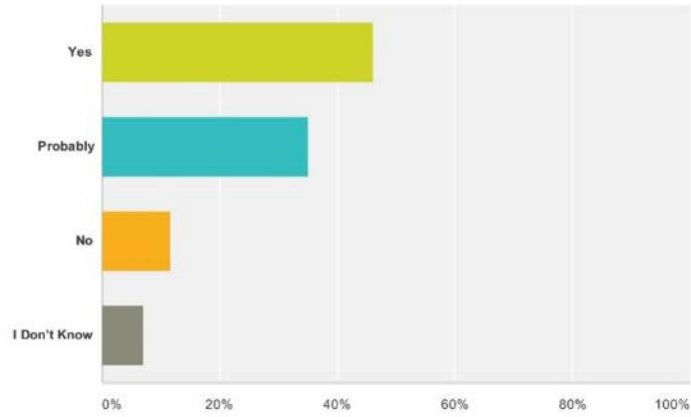
Answer Choices	Responses
Absolutely True	32.08% 77
True	39.17% 94
Somewhat True	20% 48
Mostly False	7.08% 17
Completely False	1.67% 4
Total	240

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q28 Do you think indoor water features are expensive to build/buy?

Answered: 239 Skipped: 4

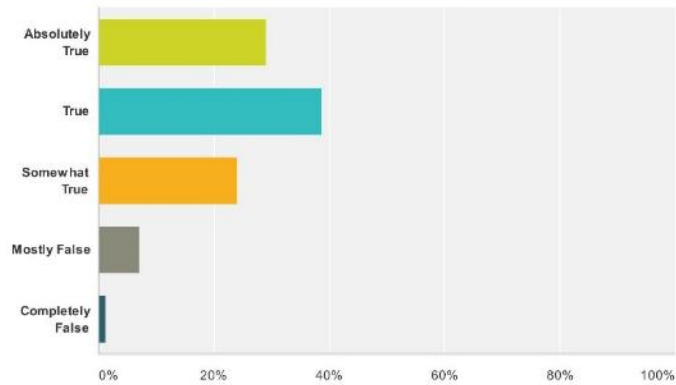


Answer Choices	Responses	Count
Yes	46.03%	110
Probably	35.15%	84
No	11.72%	28
I Don't Know	7.11%	17
Total		239

The Role of Water Features in A Modern World

Q29 Do you believe that being near a water feature positively affects your mood?

Answered: 241 Skipped: 2



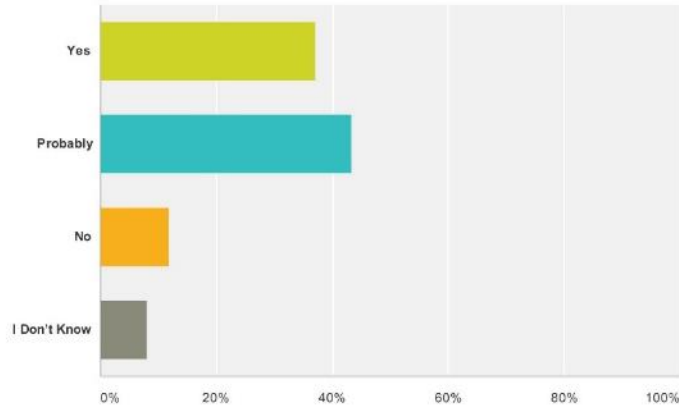
Answer Choices	Responses	Count
Absolutely True	29.05%	70
True	38.59%	93
Somewhat True	24.07%	58
Mostly False	7.05%	17
Completely False	1.24%	3
Total		241

Human Psychological Response To and Benefits of Interior Water Features

The Role of Water Features in A Modern World

Q30 Do you think indoor water features are expensive to maintain?

Answered: 238 Skipped: 5

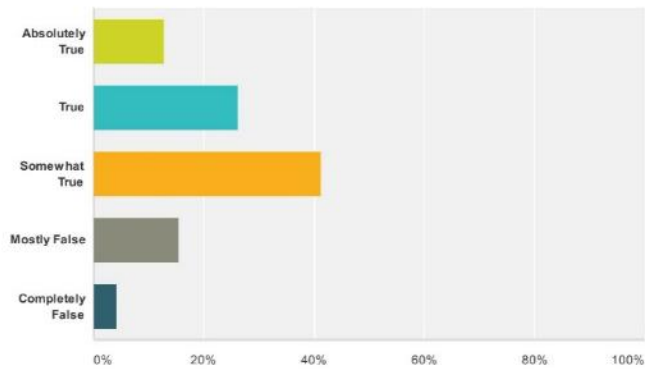


Answer Choices	Responses	Count
Yes	36.97%	88
Probably	43.28%	103
No	11.76%	28
I Don't Know	7.98%	19
Total		238

The Role of Water Features in A Modern World

Q31 I find the sight of water (such as a photograph or painting) to be relaxing.

Answered: 240 Skipped: 3



Answer Choices	Responses	Count
Absolutely True	12.92%	31
True	26.25%	63
Somewhat True	41.25%	99
Mostly False	15.42%	37
Completely False	4.17%	10
Total		240

Appendix C: Results of Survey Two

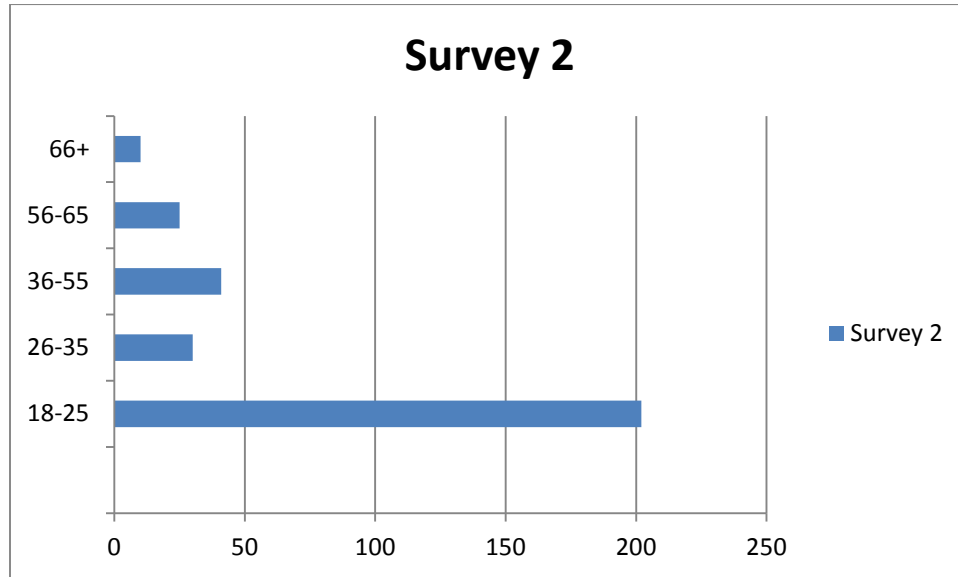


Figure 1: Question One: "Please select the age range that best describes you."

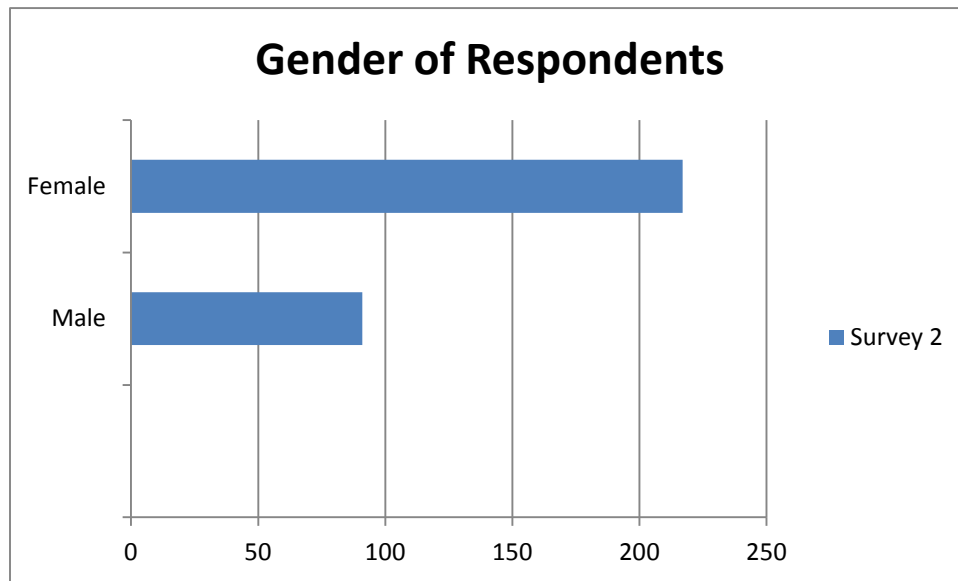


Figure 2: Question Two: "Please select the gender that best describes you."

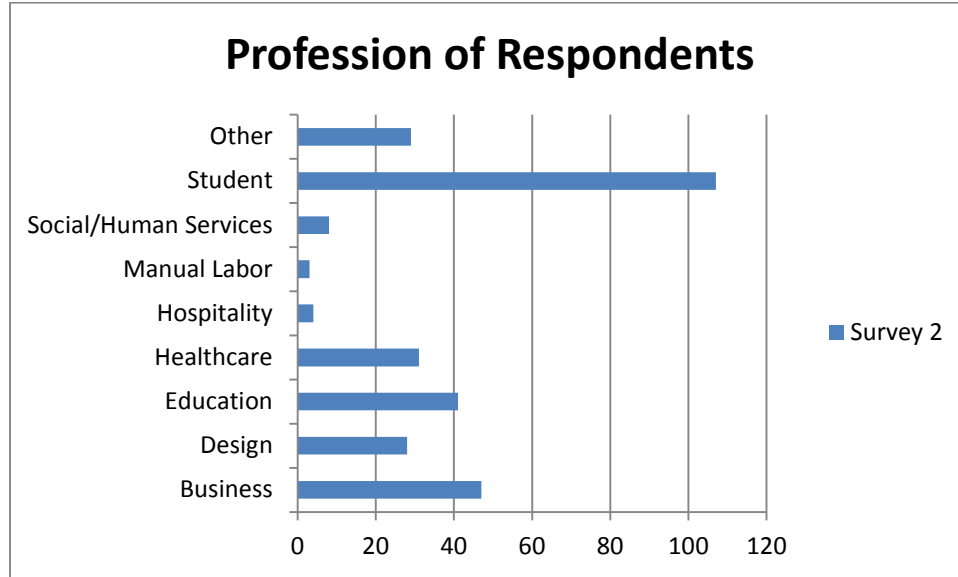


Figure 3: Question Three: "Please select the profession that best describes you."

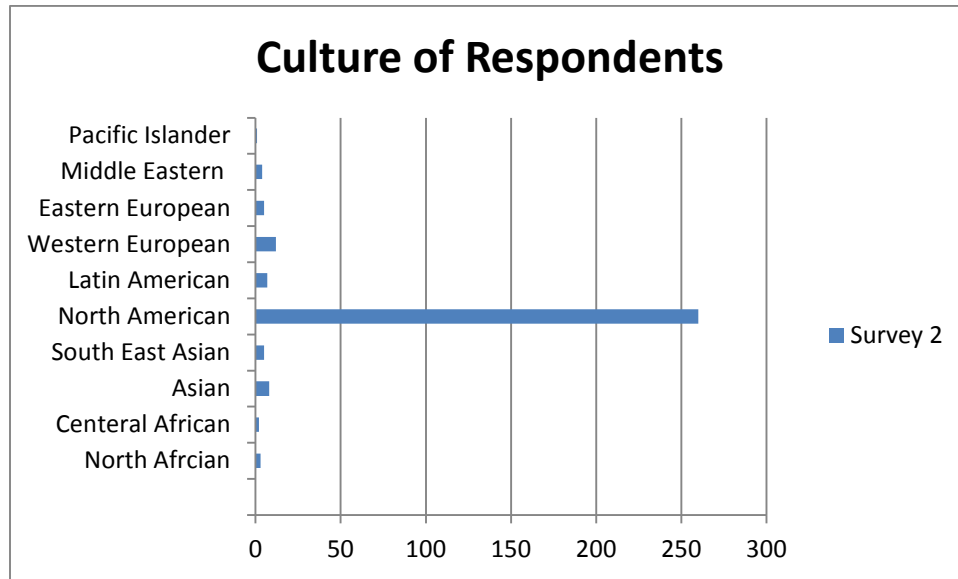


Figure 4: Question Four: "Which cultural group do you most identify with?"

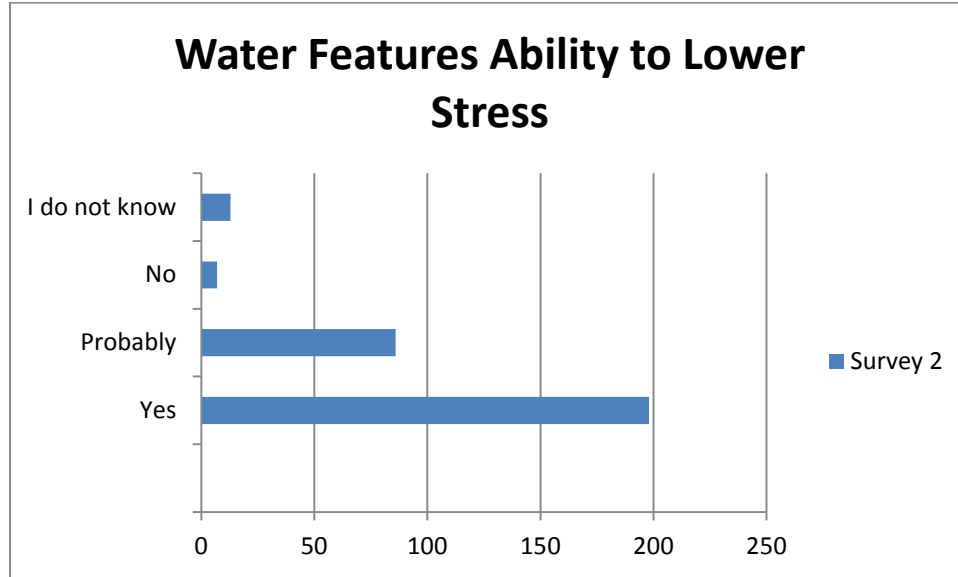
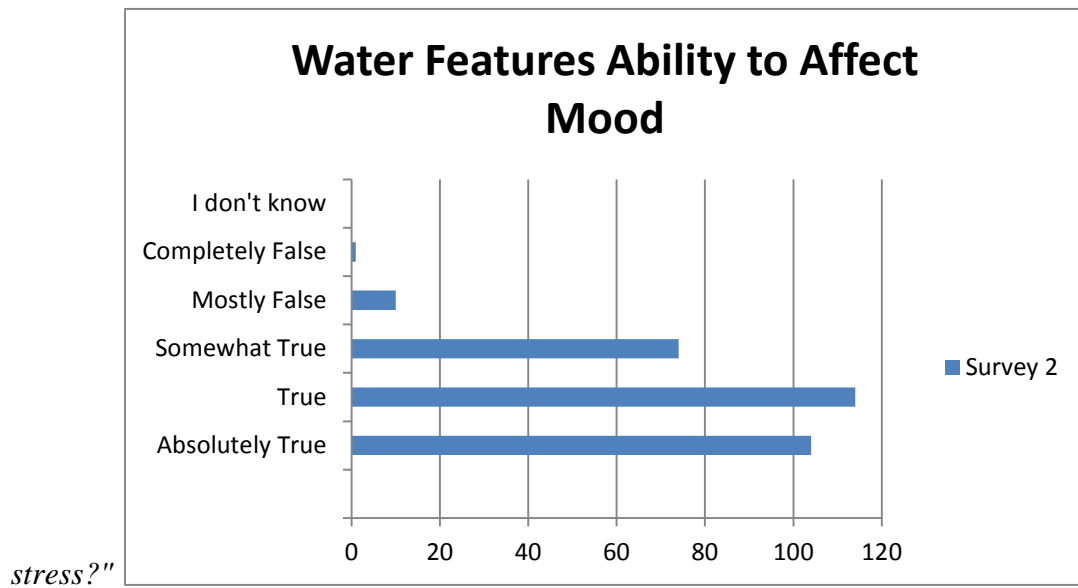


Figure 5: Question Five: "Do you think indoor water features have the ability to lower



stress?"

Figure 6: Question Six: "Do you believe that being near a water feature positively affects your mood?"

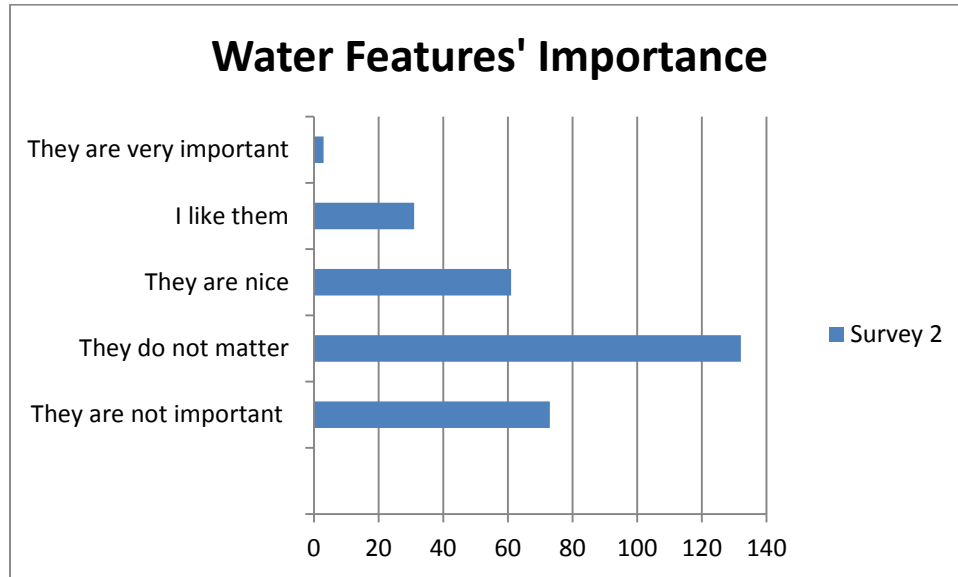


Figure 7: Question 7: "Water features within a public interior environment are important to me."

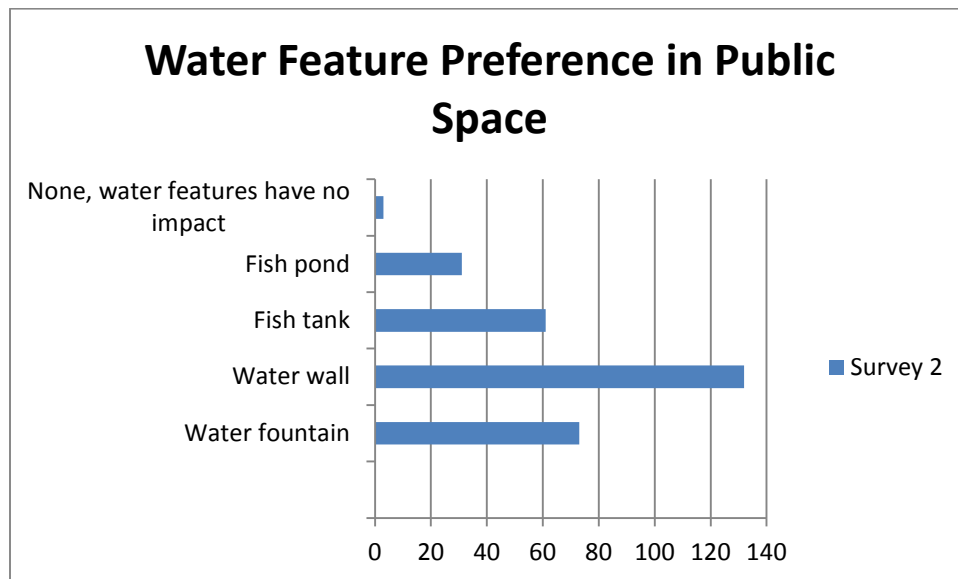


Figure 8: Question 8: "When I am in a public space, I prefer to experience a: ____"

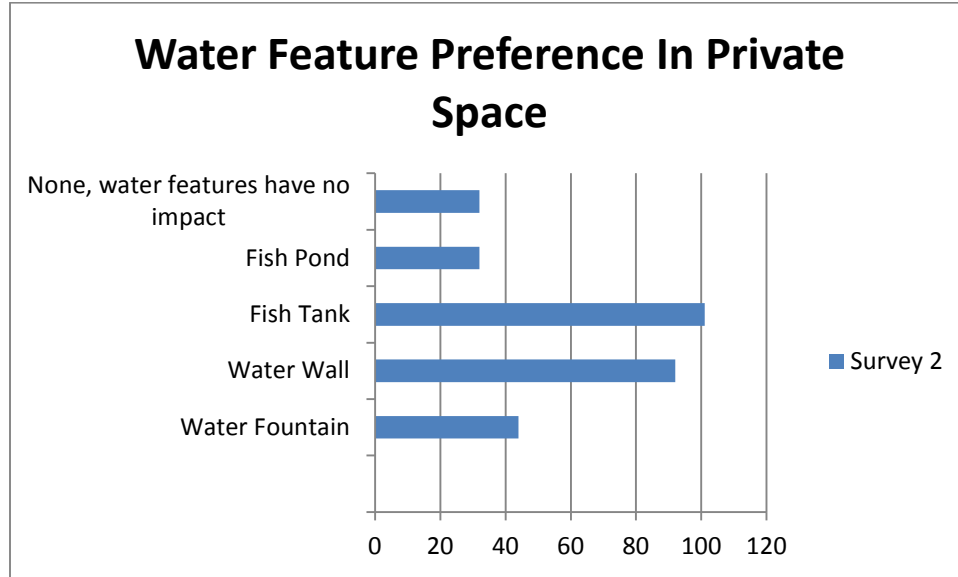


Figure 9: Question 9: "In my home, I would prefer to have a: _____"

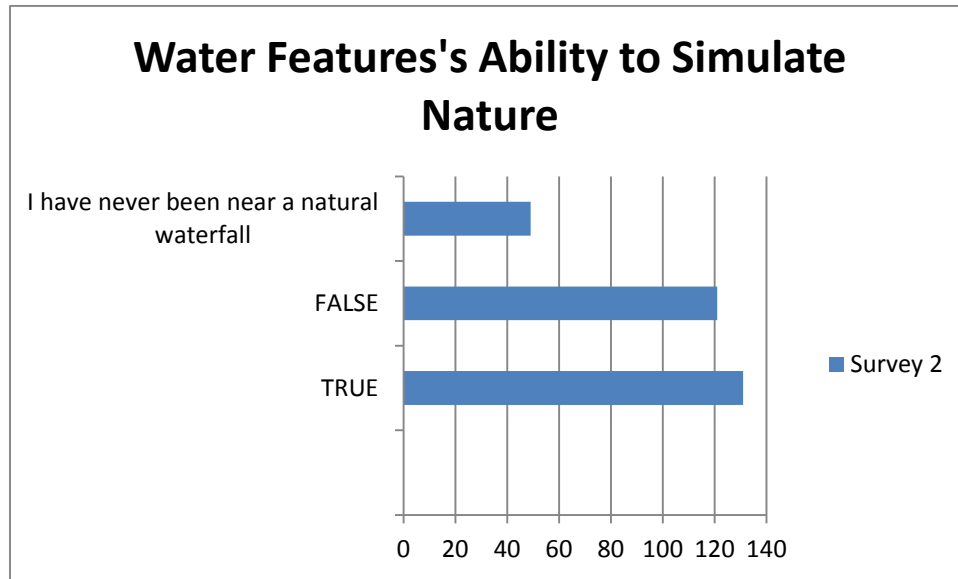


Figure 10: Question 10: "When I sit next to a large outdoor water fountain I experience similar feelings as I do when I am near a natural waterfall."

Appendix D: Survey Instrument (Survey Monkey Survey)

Facebook instructions: I am conducting research for my honors thesis and would welcome as many responses as possible. Click the link to take this short 10 question survey.

Feel free to share the link to help me get as many responses as possible.

Actual instructions on survey monkey:

This survey is for individuals over the age of 18 and is completely anonymous. By completing the survey, you are agreeing that you are 18 years of age or older.

This survey explores individual's reactions to interior water features as it pertains to interior design. The purpose of the survey is to discover if individuals have a negative or positive psychological response to interior water features.

When you have completed the survey please forward the link to as many individuals as possible in order to help us attain a holistic view of a variety of individuals' perspectives.

Definition of terms:

Water fountain: is a piece of interior architecture which pours water into a basin or jets it into the air for a decorative or dramatic effect.

Water wall: an interior wall built beside or around a body of water which water lightly trickles down and into a shallow basin at the floor.

Fish tank: an interior tank or pool or bowl filled with water for keeping live fish and underwater animals

Fish pond: a small pond containing fish for commercial purposes and display

1. Please select the age range that best describes you:

- 18-25
- 26-35
- 46-55
- 56-65
- 66+

2. Please select the gender that best describes you:

- Male
- Female

3. Please select the profession that best describes you:

- Business
- Design
- Education
- Healthcare
- Hospitality
- Manual Labor
- Social/Human Services
- Student

Human Psychological Response To and Benefits of Interior Water Features

- Other (please specify)

4. Which cultural group do you most identify with?

- North African
- Central African
- Asian
- South East Asian
- North American
- Latin American
- Western European
- Eastern European
- Middle Eastern
- Pacific Islander

5. Do you think indoor water features have the ability to lower stress?

- Yes
- Probably
- No
- I do not know

6. Do you believe that being near a water feature positively affects your mood?

- Absolutely true
- True
- Somewhat true
- Mostly false
- Completely false

7. Water features within public interior environments are important to me:

- They are not important
- They do not matter
- They are nice
- I like them
- They are very important

8. When I am in a public space, I prefer to experience a:

- Water Fountain
- Water Wall
- Fish Tank
- Fish Pond

Human Psychological Response To and Benefits of Interior Water Features

- None, water features have no value to me

9. In my home, I would prefer to have a:

- Water fountain
- Water wall
- Fish tank
- Fish Pond
- None, water features have no value to me

10. When I sit next to a large outdoor water fountain I experience similar feelings as I do when I am near a natural waterfall.

- True
- False
- I have never been near a natural waterfall

Appendix E: IRB Approval Letter



INSTITUTIONAL REVIEW BOARD

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Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional.review.board

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 16012907

PROJECT TITLE: Human Psychological Response to Interior Water Features

PROJECT TYPE: New Project

RESEARCHER(S): Alissa Clouse

COLLEGE/DIVISION: College of Science and Technology

DEPARTMENT: School of Construction

FUNDING AGENCY/SPONSOR: N/A

IRB COMMITTEE ACTION: Expedited Review Approval

PERIOD OF APPROVAL: 02/02/2016 to 02/01/2017

Lawrence A. Hosman, Ph.D.

Institutional Review Board