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Exploring What Determines Value for the Ocean

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ABSTRACT

Housing 15% of the world's species, regulating climate, and providing half of human oxygen, the ocean is quite literally mankind's lifeline. Unfortunately, this lifeline is dying. It is predicted that by 2050, over 1 million of the ocean's species will be lost to plastic, which makes up a greater percent of the ocean than fish. Hong Kong's flourishing marine trade and abundant use of plastic makes it especially susceptible to this threat. The problem, of course, is not limited to this. Brain biases prevent humans from assessing the dangers of the long term threat, and along with echo chambers they serve to spread these limiting views. To address the issue, this study aims to assess what factors generate value (internalized care) for the ocean and consequently lead to action in a largely young adult population. In the study, 81 participants were presented with a 15 question survey about their experience with the ocean and results were analyzed using qualitative analysis. It was found that the two major value generation factors were proximity to the ocean and experiencing life below water. The findings pose implications in supporting the increase of workplace and school efforts to augment proximity to the ocean as well as of advocacy missions which bring the ocean and its threats to the individual, allowing them to experience the underworld without restriction.

Introduction

The ocean serves purposes as vast and grand as its nature. To name a few, it is home to 15% of the world's species, is a crucial source of food, and provides more oxygen than the Amazon rainforests which are often thought to be the main source of oxygen. (Zhang, 2017). The ocean is quite literally mankind's lifeline. In fact, every second breath is provided by the ocean (National Geographic Society, 2012) Phytoplankton, microscopic marine algae (US Department of Commerce, National Oceanic & Atmospheric Administration, 2009) play a huge role in photosynthesizing this oxygen. The aforementioned climate regulation happens through ocean currents which, by absorbing heat and transporting cold water to the poles, make vast spherical ends of the globe habitable. On top of this, considering only two percent of the aquatic universe has been discovered, many more benefits will likely be added to the already long and growing list. However, the ocean is more than an oxygen conversion or climate regulation system. The ocean is alive: and with life comes death (Suzanne, 2018). Plastic, the man-made parasite, is said to make up a greater percentage of the ocean than fish by 2050 (*Will the Ocean Really Be Dead in 50 Years?*, n.d.). In addition, it is predicted that over one million marine species will be lost by 2050 which is over 60% of the total habitants (Brown, 2004). With Hong Kong being both a city built atop water and home to the disposal of 46.4 million pieces of single use plastic a week, it is eminent that it be studied before it is too late (Action, 2019).

Geographically, Hong Kong is one of the busiest trading ports in the world. It is surrounded by the South China Sea which is heavily polluted by a third of the world's maritime trade. Hong Kong's oceans are 40% more polluted than the global average and a 2019 survey concludes plastic particle concentration is 11 times as much as it was three years prior. Simultaneously, Hong Kong owns more water under its jurisdiction than it does land and has 1178km of coastline (*EPD - Marine Water Quality in Hong Kong*, n.d.). The population is largely exposed to the issues affecting Hong Kong's marine environment and most would have seen it first hand, however, its situations continue to worsen. Contrary to the importance of the issue rests the research done on it. Hong Kong's polluted waters

make an abundance of headlines but not nearly as many research papers. Many action oriented studies have been conducted studying the effects of different methodologies on solving climate issues, however, the preliminary step of value remains largely untouched.

The Role of Brain Biases in Limiting Action

If the ocean is so important and the threats facing it so grave, what stops people from taking action? Political psychologist Conor Seyl has done extensive research on brain biases and how they limit our abilities to process and address long term threats, specifically climate change. Evolutionarily, humans have learned to address immediate dangers before ones further away to ensure continued survival and reproduction. This way of thinking makes humans more susceptible to overestiming immeadite threats such as terrorism and understimating long term threats such as climate change and, the in many ways related issue of, ocean degradation. This phenomenon is known as hyperbolic discounting: the belief that the present is more important than the future which, once again, stems from the predispositioned nature of humans to "focus on what might kill or eat us now, not later." Another brain bias which plays a major role in ocean conservation, or the lack thereof, is the bystander effect. Individuals assume someone else will address the issue at hand thus limiting their own action. To combat this, Exposure Labs' managing director Samantha Wright proposes the localisation of efforts to combat long term issues ensuring everyone involved feeling as though they have made an impact while doing just that (King, n.d.). The potential success of proximal, localized efforts is explored through questions of ocean proximity (eg. Did you grow up next to an ocean or body of water and do you currently live next to the ocean or body of water) and initiatives taken in favor of marine conservation (eg. When was the last time you participated in an ocean cleanliness/awareness activity and do you take any personal initiatives to help in the cleanliness of our oceans.) in the survey utilized by this study.

Changing Belief and Value

The question remains, can value be generated, if at all? Though this study examines just that, it is essential to first establish what to look for when assessing the generation of a measure as abstract as value. In an article for the Stanford Social Innovation Review, Anne Christiano and Annie Neimand wrote that people care about and value what they believe. These beliefs, unfortunately, are created at a very early age, after which, through confirmation bias, individuals look to accept information which aligns with their pre-dispositioned beliefs (*The Science of What Makes People Care*, n.d.). Confirmation bias is especially pervasive in the age of social media, which further polarizes beliefs. Through echo chambers, like minded people receive likeminded information which not only serves confirmation bias but further encourages compartmentalisation due to similarity. The options remain, then, to either work to change preexisting beliefs and use confirmation bias to the advantage of the cause or aim to enforce better beliefs in the first place. A key point to note, however, is that most beliefs are developed, at least to their early stages, by the age of seven before and after which the main influence to these beliefs remains family (Heiphetz et al., 2013) . Thus, it would be most logical to target young to middle aged adults (especially those who have not had children yet but plan to) so that their changed beliefs can be leveraged to influence those of the coming generations too.

Methodology

Aim of the study

The following study aims to explore how value for the ocean is generated. An important first step, value, can also lead to action which is necessary to create tangible change.

Research Design

This mixed method phenomenological exploratory cross sectional study was aimed at dissecting the various factors contributing to value for a cause, specifically ocean conservation, and situating them into their relevant context. The study juxtaposes value against action through the comparison of first hand research findings with existing research, and suggesting applications of the research to create substantial, lasting change.

To devise an answer, a survey research design was followed where-in participants were given a questionnaire of 15 questions to self respond to. The survey aimed to assess two crucial relationships: the relationship between events/environment and value and the one between value and action. For the former, the independent variable was the events and experiences of an individual while the dependent variable became the value generated from them. For the latter, the independent variable was the intensity of value held while the dependent variable was action taken in favor of the marine environment.

Consent and Ethical Issues

The study avoided culturally or racially biased questions while maintaining an unbiased approach to data gathering on the field. For in-person interviews, responders were told to only answer what they felt comfortable sharing. This was written on the questionnaire handed to them as well. For the online surveys, the questionnaire had the same disclaimer on it encouraging voluntary participation and refraining from extracting any data from individuals which they may not wish to share. All participants were thoroughly informed of the purpose for which their data would be used and given the opportunity to ask any clarification questions, which too were thoroughly answered. All data collected was not shared with any third party and is not disclosed in this study.

Sample

A sample of 81 respondents was studied with the age range of 13-56 years. 4.9% of the respondents were between the ages of 13 years to 19 years while the other 95.1% were between the ages of 20 years to 56 years. The age bands separated teenagers and adults taking into account the lack of excess time a working adult would have to devote to ocean conservation. The mean age of the sample was 35.54 years. The sample consisted of 55.6% males, 33.3% females, and 11.1% of those who refrained from disclosing their gender through leaving the question blank.The respondents lived in Hong Kong and China though were of different origins. Though specific geographical locations of online respondents is unknown, in person surveys were conducted in the city setting of Causeway Bay, Hong Kong Island, Hong Kong and the more rural setting of Stanley, Hong Kong Island, Hong Kong to encompass two different living environments.

Instruments Used

A questionnaire of 15 questions was created in a google doc format. Google forms was avoided to promote uniformity in the questionnaire the online and physical respondents saw. The format of the questionnaire as well as the questions used can be found in the appendix. A couple examples of questions include ‘At what age did you first experience the ocean, if ever’ and ‘Do you take any personal initiatives to help in the cleanliness of the oceans? When did you start and end if applicable?’ The physical surveys were conducted on a weekday and weekend to ensure a variety of respondents. They were carried out between the hours of four and six pm.

Data Collection Procedure

10 surveys in total were collected physically and 81 surveys of the same format were conducted online across Hong Kong and China through an outreach manager. Due to the largely qualitative nature of the questions, a variety of qualitative analysis were done on the data collected. For the lengthier responses, this involved grouping based on similar terms utilized in the answers.

Results

Qualitative analysis was used to analyze the data gathered from the survey. The results of each question can be found below.

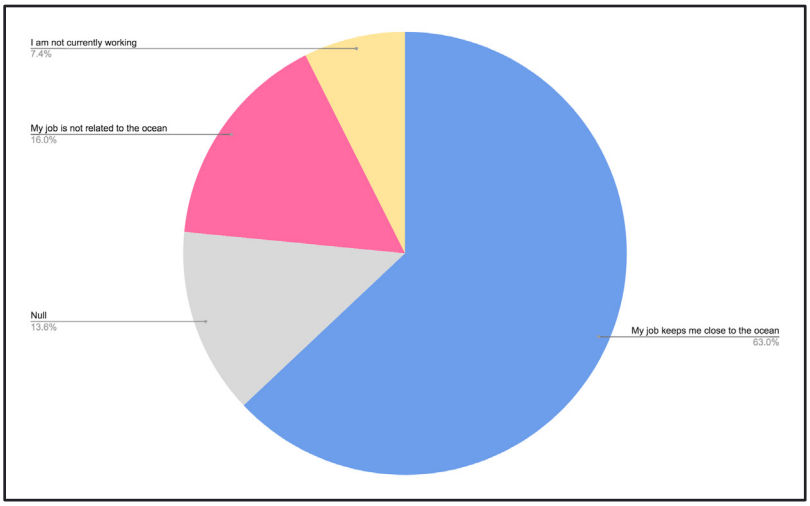

Figure 1: This pie chart represents the profession of the respondents. The percentage of those who did not respond is denoted as 'Null' (n=81).

Figure 1 depicts that out of the 81 respondents, 7.4% reported to currently not be working. These six respondents included three teenagers and three adults. 63% reported that their job keeps them close to the ocean while 16% reported their job does not keep them close to the ocean. 13.6% of respondents left this question unanswered.

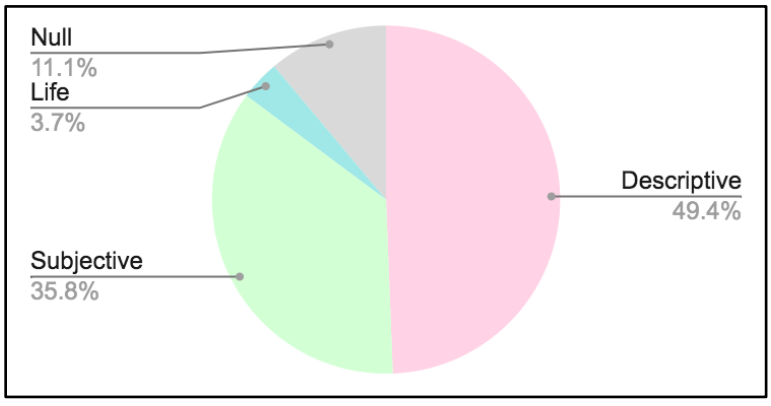

Figure 2: This pie chart represents the nature of the responses when respondents were asked to describe the ocean in one word. The percentage of those who did not respond is denoted as 'Null' (n=81).

Out of the 81 respondents, 49.4% used descriptive language to describe the ocean such as 'blue' or 'big.' 35.8% responded with subjective descriptions of the ocean such as 'beautiful' or 'great.' Lastly, 3.7% attributed life to the ocean reporting it as 'the spirit of life' or 'source of life'. The remaining 11.1% left this question unanswered (Figure 2).

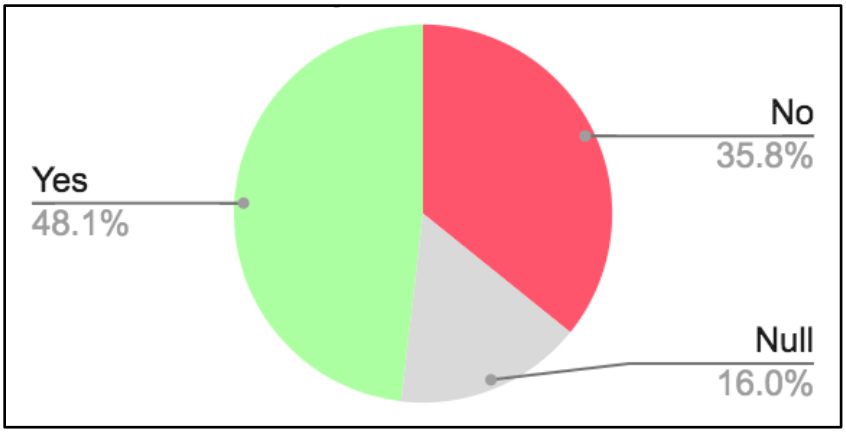

Figure 3: This pie chart represents the answers when respondents were asked whether they grew up next to the ocean or another body of water (n=81).

Out of 81 respondents, 48.1% reported growing up next to the ocean or a body of water, 35.8% reported they did not grow up next to the ocean or a body of water, and 16% left the question unanswered (Figure 3).

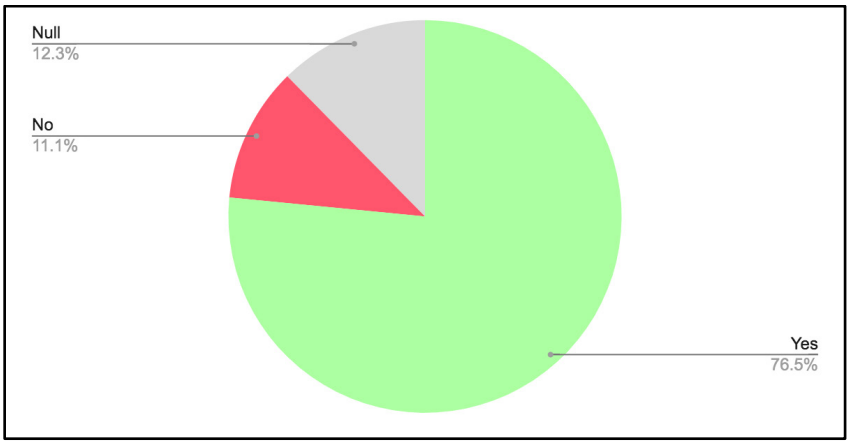

Figure 4: This pie chart represents the answers when respondents were asked whether they currently live next to the ocean or another body of water (n=81).

As a follow-up to the previous question, respondents were asked if they *now* live next to the ocean or body of water. To this, 76.5% said yes, 11.1% said no, and 12.3% did not respond (Figure 4).

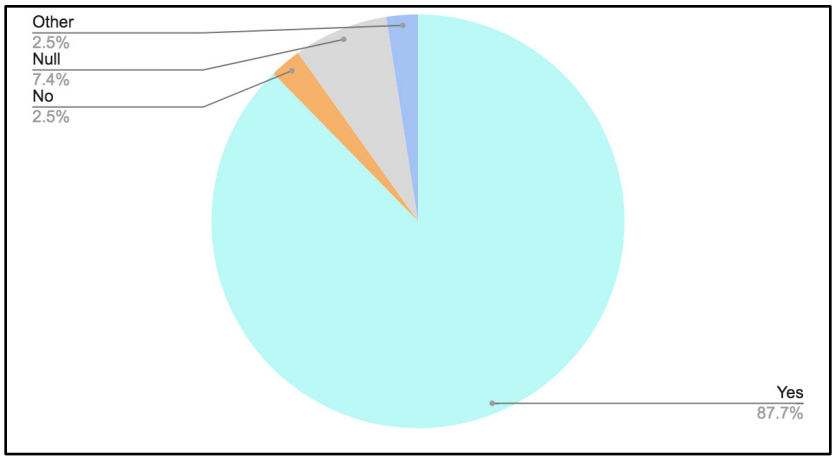

Figure 5: This pie chart represents the answers when respondents were asked whether they think they value the ocean or not (n=81).

When asked if they value the ocean, 87.7% of the 81 respondents said yes, 2.5% said no, another 2.5% chose the 'other' option and the remaining 7.4% left the question unanswered (Figure 5).

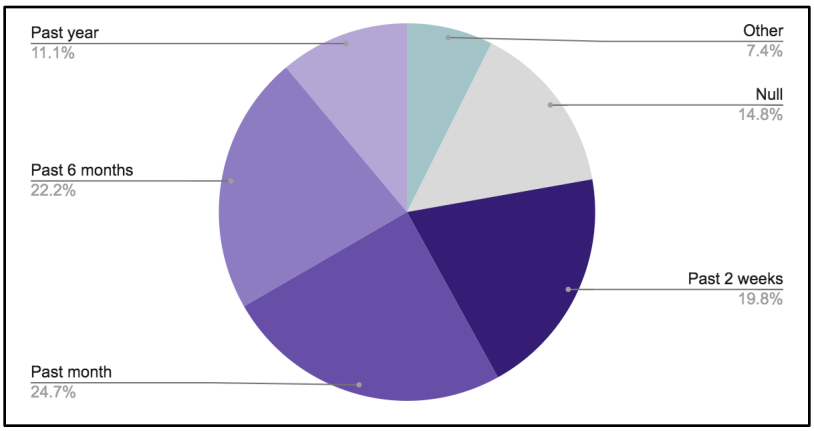

Figure 6: This pie chart represents the answers when respondents were asked when was the last time they had contact with the ocean (n=81).

Out of 81 respondents, 19.8% had contact with the ocean in the past two weeks, 24.7% had contact with the ocean within the past month, 22.2% had contact with the ocean in the past six months, 11.1% had contact with the ocean in the past year, 7.4% chose the option of 'other' and 14.8% left the question unanswered. These results were obtained in Hong Kong in December of 2021 so the winter temperatures and covid-19 pandemic affect the results found above (Figure 6).

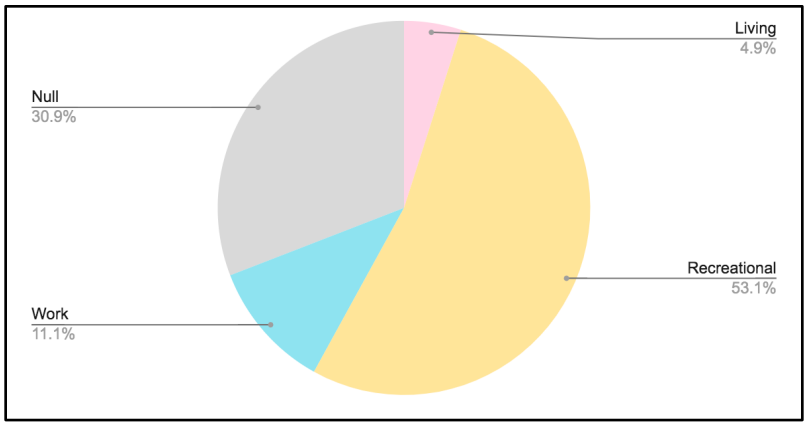

Figure 7: This pie chart represents the answers when respondents were asked to describe the nature of the encounter from the previous question (n=81).

As a follow up to the previous question, respondents were asked for the nature of the encounter of their most recent contact with the ocean. Out of the 81 respondents, 4.9% mentioned it had to do with their house and its proximity to the ocean, 53.1% mentioned it was for a recreational purpose such as 'playing with friends at the beach' or 'swimming,' 11.1% reported the encounter to be work related or as a result of their job, and 30.9% left this question unanswered (Figure 7).

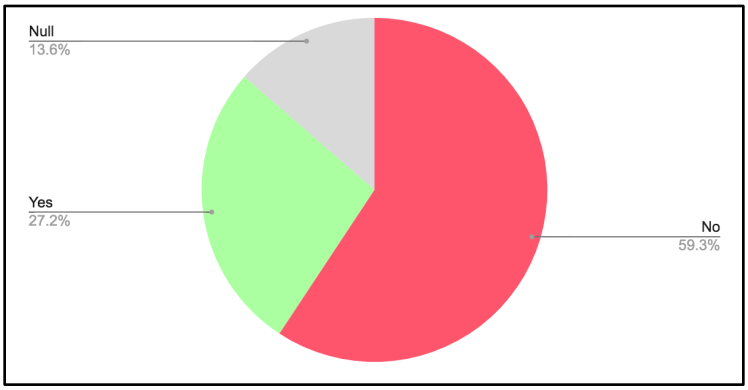

Figure 8: This pie chart represents the answers when respondents were asked whether they have ever experienced life below water (n=81).

Out of the 81 respondents, 27.2% said they have experienced life below water, 59.3% said they have not experienced life below water, and 13.6% left this question unanswered. Once again, the winter temperatures of Hong Kong in December of 2021 and the covid-19 pandemic might impact the results shown above (Figure 8).

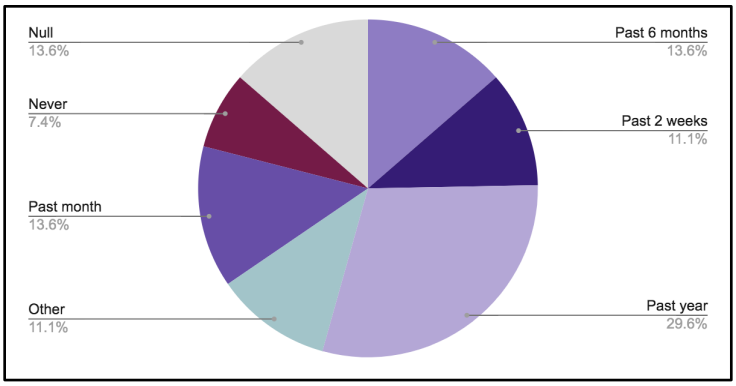

Figure 9: This pie chart represents the answers when respondents were asked when was the last time they learned about ocean degradation, if ever (n=81).

Out of the 81 respondents, 11.1% said they learned about ocean degradation within the past two weeks, 13.6% said they learned about ocean degradation within the past month, another 13.6% said they learned about ocean degradation within the past six months, 29.6% said they learned about ocean degradation within the past year, 7.4% reported to have never learnt about ocean degradation, 11.1% chose the option of 'other,' and the remaining 13.6% did not answer this question (Figure 9).

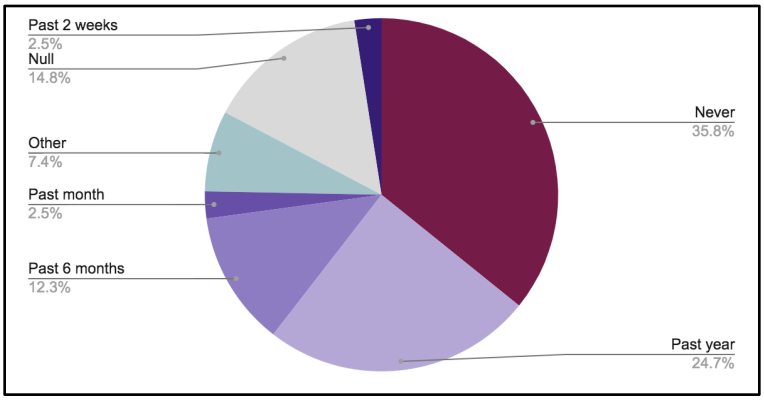

Figure 10: This pie chart represents the answers when respondents were asked when was the last time you participated in an ocean awareness/cleanliness activity? (n=81).

Out of the 81 respondents, 2.5% reported to have participated in an ocean cleanliness/awareness activity within the past two weeks, another 2.5% reported to have participated in an ocean cleanliness/awareness activity within the past month, 12.3% reported to have participated in an ocean cleanliness/awareness activity within the past six months, 24.7% reported to have participated in an ocean cleanliness/awareness activity within the past year, 35.8% reported to have never participated in an ocean cleanliness/awareness activity, 7.4% chose the option of 'other,' and 14.8% left this question unanswered (Figure 10).

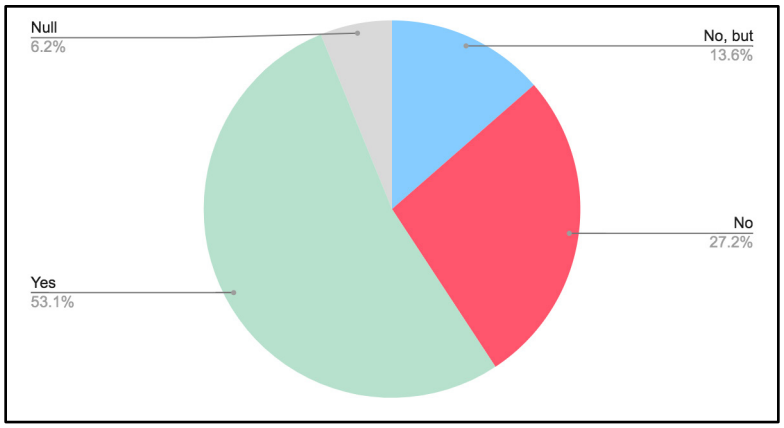

Figure 11: This pie chart represents the answers when respondents were asked whether they take any personal initiatives to help in ocean cleanliness (n=81).

Out of the 81 respondents, 53.1% reported taking personal initiatives to help in the cleanliness of the oceans. These ranged from refusing to use unnecessary plastic and educating children on the cause to volunteering with organizations and participating in field work. 13.6% reported to have not taken any personal initiatives but they would either like to in the future or their family has taken such initiative. 27.2% reported never having taken such initiative altogether and 6.2% left the question unanswered. Not all responses answered both parts of the question in full making the depth and quality of these immersions indeterminate (Figure 11).

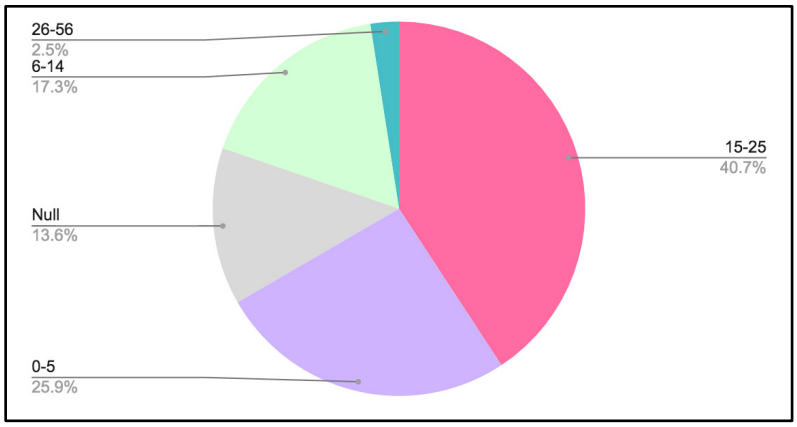

Figure 12: This pie chart represents the answers when respondents were asked the age at which they first experienced the ocean, if ever (n=81).

Figure 12 depicts that out of the 81 respondents, 25.9% first experienced the ocean between the ages of zero (as a baby younger than one year old) to five, 17.3% first experienced the ocean between the ages of 6 and 14, 40.7% first experienced the ocean between the ages of 15 and 25, and 2.5% first experienced the ocean between the ages of 26 and 56 (remaining sample size).

Discussion

The analysis of the gathered survey data aimed to help answer the question of what generates value for the ocean and what amount of value leads to action.

The respondents that answered the corresponding survey question were largely working adults, with the exception of three currently not working, making it difficult to differentiate between what generates value for the ocean in children and teenagers versus adults. It is important to note, however, the difference of power and authority held by adults. This power, of course, extends to making change. When discussing these results, the current young adult population should be looked at to create change while instilling value in the younger generation to hopefully inspire change by them sooner.

The idea of falsely held beliefs becomes prevalent when 76.5% of the respondents claiming to value the ocean as the majority (35.8%) has yet to participate in an ocean cleanliness/awareness activity and 40.8% has yet to take any personal initiatives to help. The question becomes, is it possible to care for something, to value it, without taking initiatives to help? The Oxford Languages definition of the verb value is '[to] consider (someone or something) to be important or beneficial; have a high opinion of' (*Oxford Languages and Google - English*, 2020) Theoretically it is expected that people take action for what they value yet opinion and action are correlated and one does not cause the other. There remain two explanations for this data, then. The first is that the respondents correctly self assessed their value for the ocean as being an opinion which did not always lead to action. The second becomes a limitation to the study wherein people are unable to determine or falsely determine the extent of their value.

To address more specific trends, the data was separated according to the responses of the most divided and thus significant survey answers. Results were analyzed excluding those who left the questions unanswered.

The first thoroughly examined question was whether participants had experienced life below water. Those who had never experienced life below water tended to also not have participated in ocean cleanliness activities or taken personal initiatives to help the ocean. Excluding those who left the question unanswered, 48% of people who have never experienced life below water do not take any personal initiatives for the ocean as compared to the 33% who don't among those who have experienced life below water. Both the respondents who have never taken a personal initiative to help the ocean as well as those who have not yet but hope to are counted as individuals who have not taken personal initiatives in the above statistic. Similarly, 48% of respondents who have never experienced life below water have never participated in an ocean cleanliness/awareness activity compared to the 27% who have not among those who have experienced life below water. The respondents who did not take part in any ocean awareness/cleanliness activities were also the ones likely to not take any personal initiatives. This finding is supported by the tendency of humans to attribute value to beauty. In a study done by Christoph Klebl and Yin Luo from the University of Melbourne, it was found that people show a greater want to protect what is more aesthetically pleasing when it comes to animals, humans, landscapes, and buildings . Being a combination of animals and landscapes, this idea applies to the ocean. However, most of Hong Kong's youth has not experienced colorful, flourishing marine life in Hong Kong because it has degraded. The sense that "there isn't much to preserve" instills along with a lack of care for remaining marine life associated with its beauty. Of course, beauty is subjective. Looking at the finding from a perspective that Hong Kong's ocean's are beautiful, those who have not experienced them will be unable to witness this. Interestingly, those who have experienced life below water tended to describe the ocean with more subjective terms while all three of the respondents attributing life to the ocean were found among the group that have never experienced life below water. To explain this, there is the possibility of coincidence, that some respondents may have been primed to respond with terms relating to life or there is once again the aspect of falsely held beliefs. When we think of life we think of flourishing nature-something with the potential of growth. Perhaps the lack of contact with life below water makes certain individuals blind to the detriments of the ocean.

An in depth analysis was also done on proximity to the ocean using questions such as did you grow up next to the ocean or body of water and do you currently live next to an ocean or body of water. Those who grew up next to the ocean are more likely to continue to live next to the ocean. With the exception of one respondent, all those that grew up next to the ocean or a body of water still do live next to the ocean or body of water. It is also found that those who grew up next to the ocean have participated in more ocean awareness/cleanliness activities. This can be explained by the abundance of time and perhaps college incentive to help in the state of the ocean when one is growing up, as opposed to the lack of excess time as an adult with job occupations. A potential skewing factor to the study is Hong

Kong's expatriate population comprising about 4.2% (Asia Insurance Review, n.d.)) of its total population of almost 7.5 million (*Hong Kong*, n.d.). This percentage is one of the highest in the world. This means, although the respondents are currently living in Hong Kong (with a coastal area of 1,178km (*EPD - Marine Water Quality in Hong Kong*, n.d.)) or China (with a coastal area of 18,000km (Song, 2022)) , they could have grown up in a place with more/less/better/worse exposure to the ocean. This exposure during their formative years (especially before the age of 7, as mentioned in the introduction) would have created their beliefs about the ocean.)

Additionally, current proximity to the ocean makes it easier for individuals to partake in preservation activities with the added incentive of reminiscing about the past. Those who lived in close proximity to the ocean also reported having more recent contact with the ocean making them more aware of its conditions on a daily basis. Much like we often put the clothes we haven't worn in a while to the front of our closets so we don't forget about them, proximity to the ocean acts as a constant reminder that there is this additional body of life that is out there and needs help.

Implications

Understanding the driving factors of value can be leveraged to generate it to a point of action. The two key takeaways, or generators of value in a largely young adult population, are proximity to the ocean and experiencing life below water. Though this study tested proximity to the ocean in relation to housing situations, proximity can also be created by frequent visits to marine bodies. This can be done in the form of conservation efforts undertaken by the workplace. When looking for exercises to build team cohesion, marine conservation efforts can prove to be a fruitful option, Further, keeping in mind that most major beliefs get formed before the age of 7, this idea of proximity can be tested and stretched to a younger population in the form of field trips.What is crucial here , however, is that these proximity efforts must be sustained and consistent to come close to the proximity experienced by those living next to the ocean. The second major implication would be encouraging the experience of life below water. In the young adult population, this can be achieved through scuba dives, glass bottom boat trips (an effort undertaken by Hong Kong marine parks currently), and more. When on site ocean conservation efforts take place, the underwater environment will be improved in a positive cycle leading to a more prominent belief that the underwater world of Hong Kong is 'beautiful' and worth preserving, However, when considering a younger population, specifically below the age of seven, or even when considering the various time constraints and restrictions on adults, this option becomes quite difficult. The answer is simple, if one cannot go to the ocean, the ocean must be brought to them. Through immersive learning programs using a miniature *realistic* sea model, young kids may start to experience all that the ocean encapsulates in its simplest forms. For adults, participating in similar awareness programs may prove to be effective, however, further research can also be done on whether experiencing the ocean first hand has the same effect as experiencing it vicariously such as through documentaries. All such specific, localized efforts will work to make the daunting issue of ocean degradation more digestible, allowing people to feel as if they have or must make a difference.

Conclusion

There were two main findings derived from this study the first being experiencing life below water leads to a want to preserve it. Those who have experienced life below water were 21% more likely to participate in preservation activities or take their own initiatives to do so. This was explained by the innate qualities of humans to equate worth or value with beauty which was either not perceived or not experienced in Hong Kong's waters. Secondly, recognizing Hong Kong's heavy expatriate population, it was found that all those that grew up next to the ocean also currently live next to the ocean (with the exception of one respondent). This proximity makes contact with the ocean easier and more frequent additionally acting as a constant reminder of the threats faced by the ocean.The findings can be levered to encourage frequent proximity to the ocean by the workplace of adults and schools of children. On site underwater

actions canoe undertaken to create a cycle of improvement that increases perception of Hong Kong's underwater world as something worth preserving . Ultimately this will break down the issue of ocean conservation into comprehendible, actionable items through the generation of value creating tangible change.

Limitations

Surveys themselves hold inherent biases in their nature onto which interview surveys add. In any self reporting methods such as interviews, surveys, or a combination of both, respondents are treated with the assumption that they can explain themselves to an accurate degree and their perceptions of basic scales are comparable. For example, when using a likert scale, it is assumed that all respondents possess the same ideas of values on a scale (eg. two people might claim they 'strongly value' the ocean while one does beach clean ups every weekend and the other has a misconception). Additionally, time constraints of interviews reduce the sample size significantly. It is also difficult to truly randomize the sample. However, a natural environment was controlled to the best of the researcher's ability. Since interviews are a form of social interaction, extroverted people might be more likely to say yes to them.

Acknowledgments

I would like to thank my mentors for issuing deadlines to ensure this research gets completed on time, providing ample feedback, and encouraging my endeavor. I would like to thank my family for their constant support and help with the survey process. I would like to thank my respondents for making this research possible: for taking the time to fill out the questionnaire to the best of their ability.

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