Cultivated Wild: Enhancing Human Health in Cities Through Green Projects Especially During a Pandemic

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Abstract

The University of Richmond Eco-corridor, a new renovation project, transformed a wildly overgrown area into one of beauty with several recreational uses. The opening of this project comes at an important time for local outdoor recreation in cities, the COVID-19 pandemic. Previous work has suggested that landscapes are more beautiful when there is minimal human impact, therefore wilderness scenes are more likely to be used for nature walks and observing nature. While other studies suggest that beauty is dependent on how the land may be used, suggesting that "cultivated wild" is preferrable. This paper used an observational study and a survey to determine the effectiveness of this project for enhancing human overall wellbeing and increasing usage of the space. The observational study found roughly 350 people use the Eco-corridor on a normal day (with large variance according to weather and time of day). While the survey found that only 18% of participants used the space before. Proposed additions to the Eco-corridor were examined and the most favored were presented. The overall effectiveness of the project is further discussed.

Introduction

As society has moved away from hunter-gatherers towards an era of information-based collection, increasingly more time is spent indoors and sedentary. This has led to the emergence of obesity and overweight issues which increase an individual's risk to chronic diseases and disorders such as type 2 diabetes, different cancers, and others (Mokdad et al., 2003, Rosenberger et al., 2009). In contrast to this, many studies have shown the importance of outdoor recreation on physical health as well as mental health (Bennett, 1995; Ellis et al., 2002; Frances, 2006; Godbey, 2009; Manning, 2011; Nordh et al., 2017; Norman et al., 2010; Rosenberger et al., 2009; Sloan et al., 2016; Ulrich, 1979; Weller et al., 2020).

Although there are plenty of benefits to outdoor recreation, the development of cities has continued to decrease surrounding natural areas (United Nations, 2012). As city populations have increased, access to nature within cities has decreased leading to "extinction of experience" or the loss of experiences spent in nature providing a bias against conservation efforts and overall indifference towards nature (Kowarik, 2013, Miller 2005). Research conducted by Berg et al. (2007) suggests that even through the increase of urbanicity, a desire for nearby nature like in suburban areas is prevalent, concluding that access to nature is necessary for psychological restoration.

Yet, cities have only continued to increase, which has led to a larger globalization of markets, and greater worldwide interconnectivity (Short, 2013). The COVID-19 pandemic has been fueled by this connectivity (Mas-Coma et al., 2020), drastically affecting the world, leaving an estimated 7.7 million Americans out of work, and many others on extended leave, or changed to virtual work (Fronstin & Woodbury, 2020). Without normal social interactions and increased time spent on the internet, individuals are feeling more "burnout" which is the point where limits have been met emotionally, physically, and/or mentally (Queen & Harding, 2020). Whether intentional or not, with increasing levels of burnout, there has been an increase in outdoor

recreation and time spent in nature, hinting to its restorative power suggested by Berg et al. (CivicScience, 2020; Rice, Mateer, et al., 2020a, 2020b; Rice, Meyer, et al., 2020 ; Rice et al., 2019). Overall outdoor recreation has been projected to increase by 15% this year (CivicScience, 2020), however locations of outdoor recreation and activities participated have changed (Rice, Mateer, et al., 2020a, 2020b; Rice, Meyer, et al., 2020).

Throughout Rice et al.'s (2020, 2020a, 2020b) three part study, the results showed an increase in local activity, in particular within neighborhood and backyard spaces but a decrease in activity within spaces that require more than a 30 minute drive especially national parks and locations outside of the individual's state (this study did not take into account the closing of parks, just simply asking whether participants were spending time there). In terms of recreational uses, activities which may be more extreme or require more planning and preparation such as backpacking, camping, downhill skiing, and climbing all had decreased since the beginning of the pandemic to the end of the study (March 11 – May 21) however simpler activities such as running, bicycling, birdwatching, and gardening all increased. Perhaps one of the most important results from the longitudinal study is that most of the participants listed that the new recreational hobbies which they had taken up during the pandemic will be continued after the end of social distancing and precautionary measures.

Increasing levels of outdoor recreation and desires for nature in urban settings have influenced city planners and legislators to re-evaluate plans and include creation of new natural components to city layouts. The Office of Sustainability for the City of Richmond has recently announced a plan which proposes a goal that every household within the city shall be within a 10 minute walking distance of a nature park (*Final Plan | Richmond 300*, n.d.). Other cities have implemented similar goals, with varying levels of success, some good examples include Chicago's Riverwalk (*Chicago Riverwalk*, n.d.) or New York City's High Line (*The High Line*, n.d.). An important note is that these projects have been successful due to their use value to residents, meaning residents enjoy these parks because of the variety of activities they can do in them. However, studies have shown that proper management structures and maintenance of these places can be a key component to a project's success along with recreational use (Miller et al., 2019; Rice, Newman, et al., 2020; Rice, Taff, et al., 2020). One study by Rice, Taff et al. (2020), discussed the differing approaches to park management which led to better visitor enjoyment. They found that management practices have been creating a false dichotomy, that to better visitor experience, one must focus either on motivations that guide behavior or the outcomes of recreational activities. Instead, a proper management strategy focuses on both the motivations that drive them to use a natural park and the outcomes they wish to achieve through that use. Understanding why people want to use the Eco-corridor and what they hope to get out of it is essential for having the project be effective.

Purpose

Previous research has suggested that landscapes are preferred with fewer people and man-made development (Carls, 1974; Hodgson & Thayer, 1980), while others also suggest that the beauty of a landscape comes from the perceived use of the land as well as the options for personal use (Anderson, 1981; Jr et al., 1969; Ribe, 2002). Combining the information from these studies shows that there is a preference for landscapes that are minimal in human activity while also beneficial to human activity such as recreation. However, no research has been conducted to note specifically if projects like city parks are beneficial because they provide

nature and recreational use, or if it is simply the addition of nature to man-made landscapes. This project will explore the intricacies of nature in cities by examining the University of Richmond's latest environmental project: The Eco-corridor. The Eco-corridor is a project championed by the University of Richmond and the Office for Sustainability in the City of Richmond which completed a stream restoration that included new additions of a walkway, access to the stream, and two outdoor classrooms in the hopes of benefiting both the natural environment and human health. The purpose of this study will be to determine the effectiveness and importance of the Eco-corridor on individual mental and physical health as a sample cultivated wild project, provide evidence of the project's success for support of similar projects, and suggest new additions to the project to increase outdoor recreation use. I hypothesize that the Eco-corridor is an effective project for human wellbeing because of its addition of appealing natural features and option for recreational use. However, the effect may not be large due to the already existing natural recreation spots on campus (Westhampton Lake & the several green areas) and limited types of recreational use.

Research Design & Methods

This study's research design is a mixed methods approach gathering both quantitative and qualitative data using two different techniques. First, in person observation was collected of how many and which individuals utilize the corridor and for what use, to have a general understanding of the current use. (Important to note about the observational study: the data collected will not be used to assess effectiveness of the project, but rather gain base line information regarding usage of the Eco-corridor to get an understanding about how many people utilize the space on a given day, I do not suggest there to be an "effective" number of people who use the Eco-corridor.) Third, a survey was sent to students, staff, and faculty at the university to get qualitative and quantitative data on student's interactions, thoughts, and feelings regarding the Eco-corridor.

The observational study occurred by the researcher sitting at one of the tables near the entrance of the corridor for one hour, at randomly selected hours and days of the week in hopes of obtaining an accurate average. At the start of the hour, the researcher wrote down the outside temperature using a weather app and noted the current conditions at the spot. These conditions were noted for the record in case there were drastic changes in Eco-corridor users that could be attributed to weather. While sitting there, the researcher marked a line on a piece of paper every time a person entered or exited the Eco-corridor (individuals were observed and details remembered to ensure that no one was counted twice). The researcher created three separate tallies, one group for those who seemed to be UR students, another group for those who were children, and the final group for perceived adults (not UR students), ambiguous individuals were tallied under the category which seemed most appropriate. Days and times were randomly selected throughout the month of October, using a computer generated selection a total of 5 days were chosen. Times prior to dawn and after dusk were not available since the Eco-corridor is officially closed and would most likely differ from daytime. Selected days which there was rain during the selected time were either moved to a different time that day or to the next rain-free day. The days, times, and temperatures when data was collected are as follows: October 6th at 10 am (72°F and partially cloudy), October 14th at 3 pm (82°F and sunny), October 16th at 12 pm

(65°F and windy with clouds), October 24th at 1 pm (59°F and heavy clouds), and October 29th at 4 pm (78°F and sunny).

The survey consisted of 12 questions regarding knowledge of the Eco-corridor, whether they use the space, why they do or do not use the corridor, perceived benefit, activities they do or could do, general attitudes towards the Eco-corridor, what can be improved, and attitudes towards proposed additions that aim to increase recreational options. Some example questions are "What activity or activities do you use the Eco-corridor for?", "During a typical week, how often do you spend time in the Eco-corridor?", "To what extent has the Eco-corridor helped reduce your stress?". If survey participants did not know about the existence of the Eco-corridor, they were given a description of the Eco-corridor and then were asked the same questions as the other group but in terms of hypothetical use now that they are informed. Following the questions about the Eco-corridor, participants were asked to complete the Affect Balance Scale, designed by N.M. Bradburn (1969) to measure overall happiness and wellbeing by asking 5 positive and 5 negative questions, whether they have felt a certain way within the past 7 days (i.e., On top of the world? Bored?). Then a separate Satisfaction with Life Scale, designed by Ed Diener (1985), a 5 question test that asks participants to rate on a 1 to 7 scale how much they agree with statements such as "I am satisfied with life" or "In most ways my life is close to my ideal" used to measure life satisfaction. Following that scale, the Perceived Stress Scale 10, by Sheldon Cohen (1994), asks ten questions regarding stress within the last month from 0 to 4 such as "In the last month, how often have you felt nervous and "stressed"?" or "In the last month, how often have you felt that things were going your way?". This scale was then used to measure stress for the participants. Finally, participants were asked questions regarding their perceived physical health, such as "How physically active are you?" (rated on a scale from 1 to 10), "How has your level of physical fitness changed since you arrived at school?" (from 1 to 7). As well as questions regarding physical health in relation to the Eco-corridor: "Would you attribute the Eco-corridor to playing a role in your physical fitness?" and "If you use somewhere else and not the Eco-corridor for physical health, why do you not use the Eco-corridor?" (participants were given 6 different options including an undefined "other"). The survey was sent out to all current students via Spiderbytes, but this was unable to be sent to faculty and staff. It was also shared amongst social media by the researcher and sent to outdoor and environmental clubs/organizations on campus. A total of 60 participants were collected, however 15 individuals either did not complete the survey or had malfunctions and did not have a complete response. The remaining 45 participants (42 female) were analyzed, and the results are expressed utilizing frequency charts and scatter plot graphs. Only one University of Richmond staff member completed the survey, the remaining 44 were University of Richmond students, ages ranged from 18 to 24. All participants responded that they did in fact know of the Eco-corridor, therefore it was not possible to make a comparison between individuals who did and did not know about the Eco-corridor.

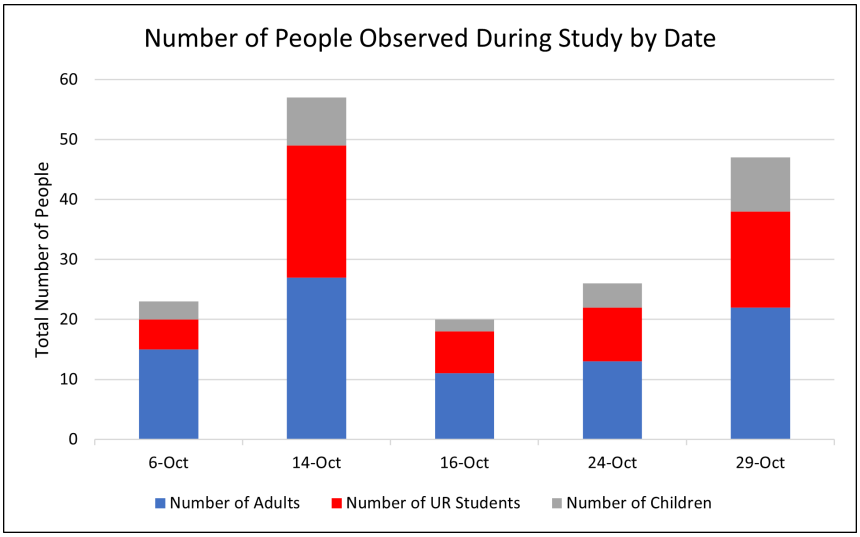
Using these two research tools the study hoped to find a stronger positive effect of cultivated wilderness on human health rather than true wilderness and suggest evidence for the improvement of the Eco-corridor and similar projects.

Results

Observational Study

Across the 5 days of observation, a total of 173 people were observed using the Eco-corridor (overlap of individuals across days was not collected). (See **Figure 1**). October 14th was the day with the most observations of 57 individuals. October 16th was the day with the least observations of 20 individuals. The adult-identified age was the group that used the Eco-corridor the most, making up 88 individuals, with a day maximum of 27 and minimum of 11. The children-identified age was the group that used the Eco-corridor the least, a total of 26 were identified, a day maximum of 9 and minimum of 3. On average 35 people visit the Eco-corridor every hour.

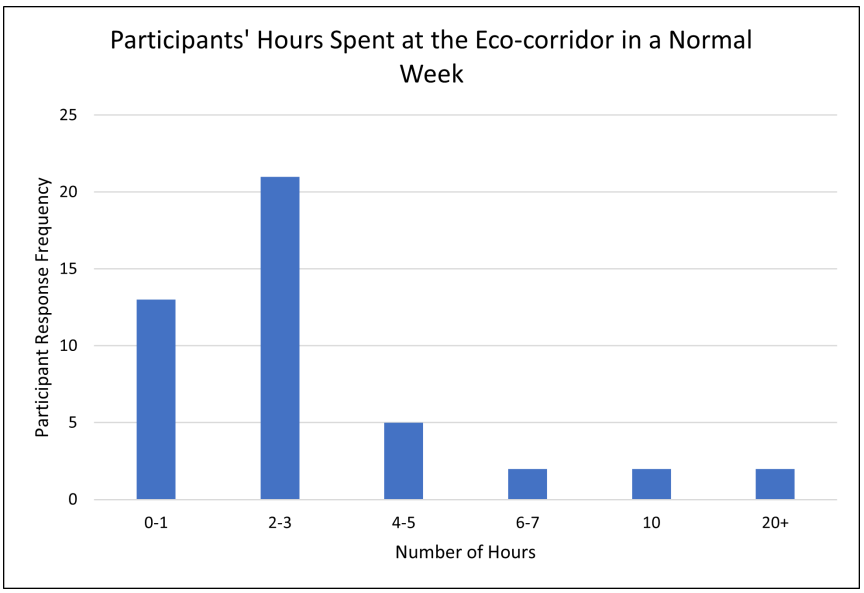
Figure 1.



Survey

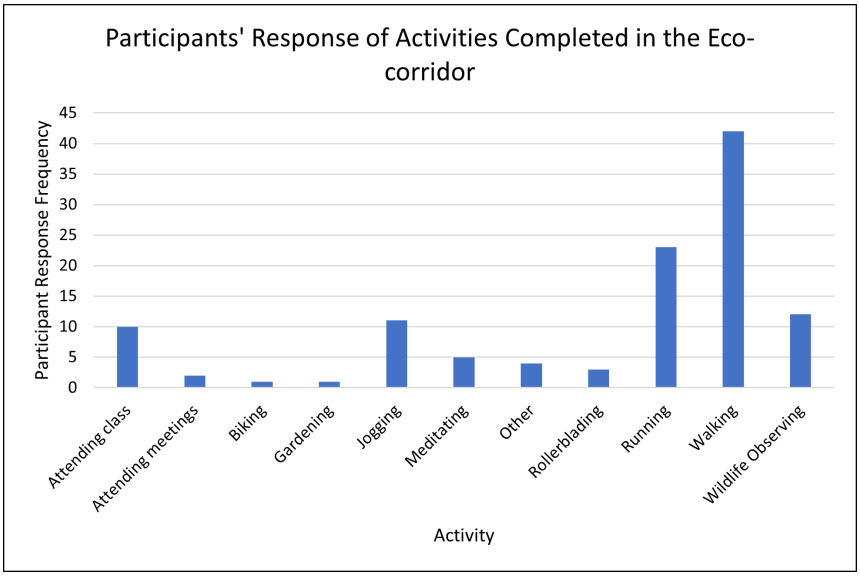
The majority of participants (82%) responded that they did not regularly go to the Eco-corridor prior to the renovation project. However, since the renovation, 39 out of the 45 participants responded that during a normal week they spend at least one hour at the Eco-corridor. The most common number of hours spent in the Eco-corridor during a normal week were between 2 and 3 which 23 participants responded was how much time they spent (See **Figure 2**).

Figure 2.



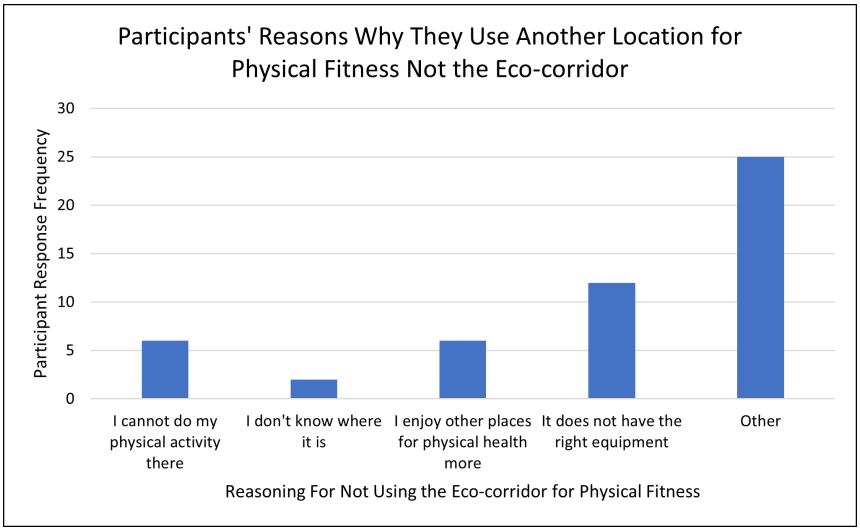
Almost all participants reported that when they used the Eco-corridor, walking was one of the activities they participated in (42 out of 45 respondents, each respondent could answer with multiple selections). Running and wildlife observing were number 2 and 3 respectively, besides jogging and attending class all other remaining activities had less than 10 people report they used the Eco-corridor for that purpose (See **Figure 3**).

Figure 3.



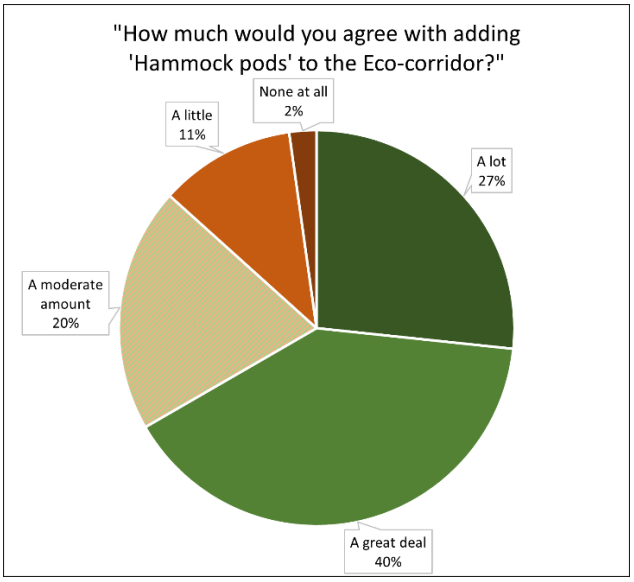
Participants when asked about why the Eco-corridor may not be their primary location for physical fitness had a multitude of answers, the most popular option was “Other” (25 responses). This could describe any other reason not previously listed as an option, including that the Eco-corridor is their primary location for exercise. (See **Figure 4**).

Figure 4.



After analyzing the responses to the proposed additions to the Eco-corridor, the 3 most favored and 3 least favored options are reported below. The most agreed upon proposal is the addition of hammock pods to the Eco-corridor, 67% of participants responded with either "a great deal" or "a lot" (See **Figure 5**). Recliner chairs or Adirondack chairs and a Fire pit were also both highly agreed upon as good additions (62% of participants). (See **Figure 6** & **7**). The least favored proposal an addition of an Outhouse/compositing toilet, 62% of participants responded either "None at all" or "A little" (See **Figure 8**). Recreational guides/trip leaders and birdwatching stations were also not well liked proposals (58% and 41% of participants respectively choosing "none at all" or "a little"). (See **Figure 9** & **10**).

Figure 5.



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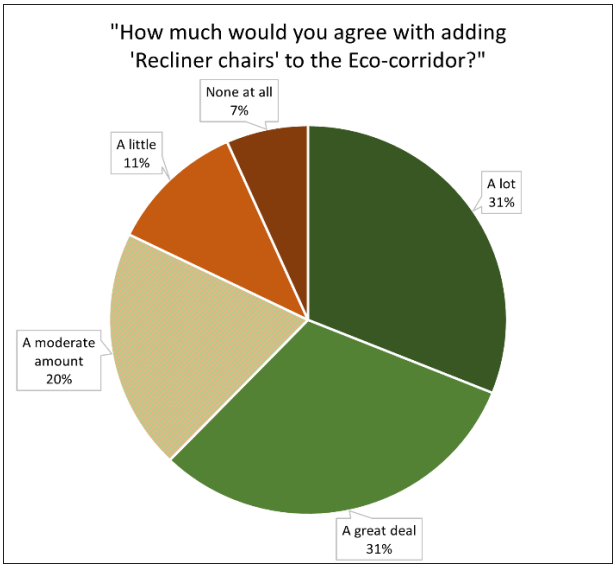

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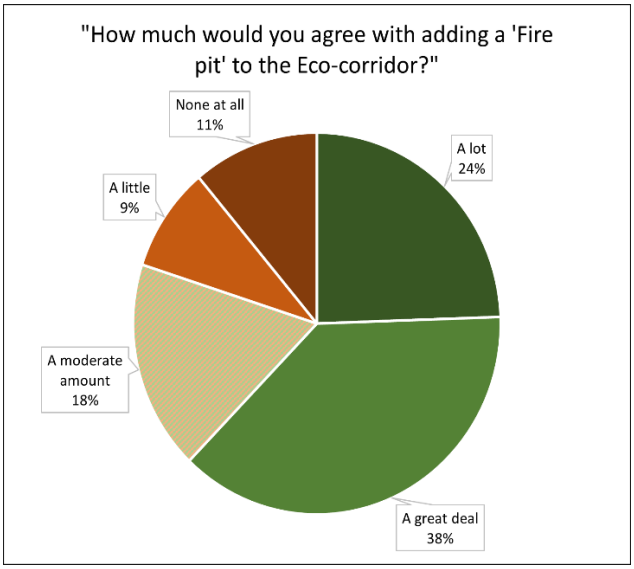

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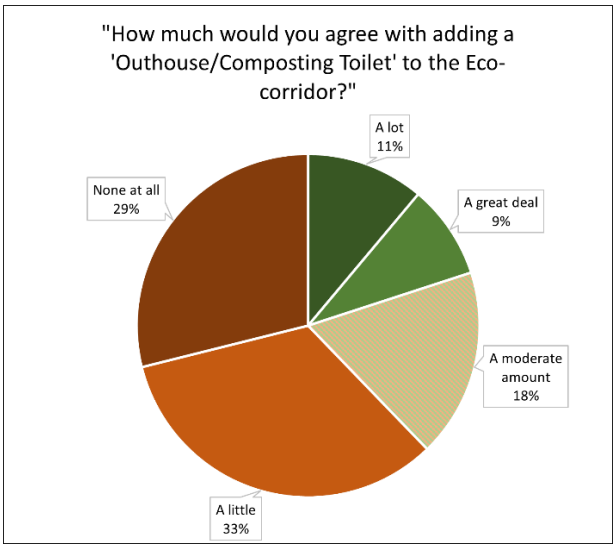

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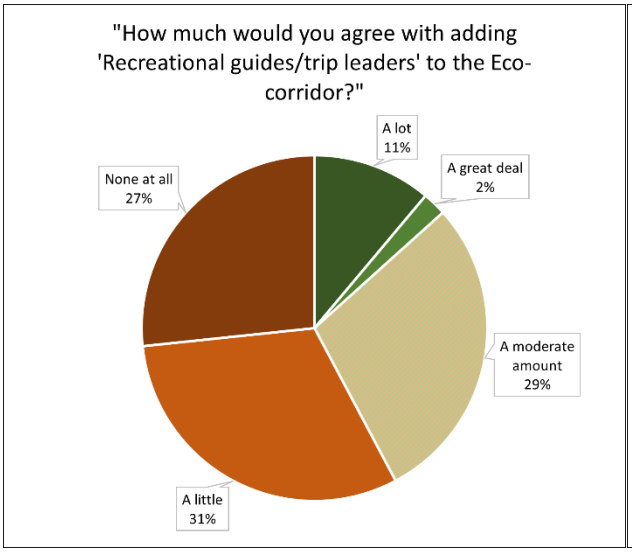
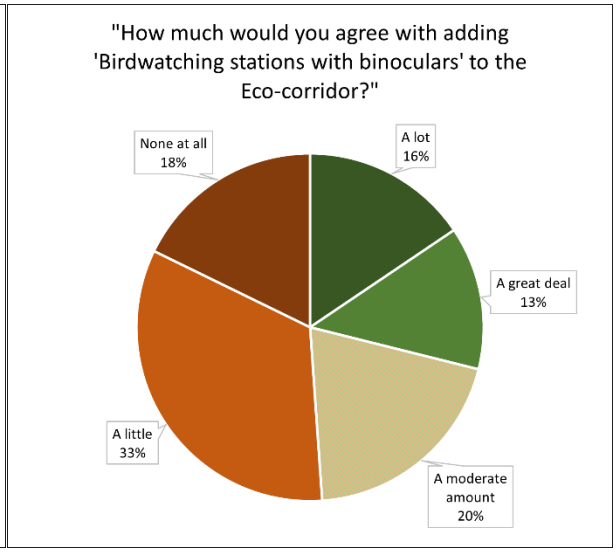
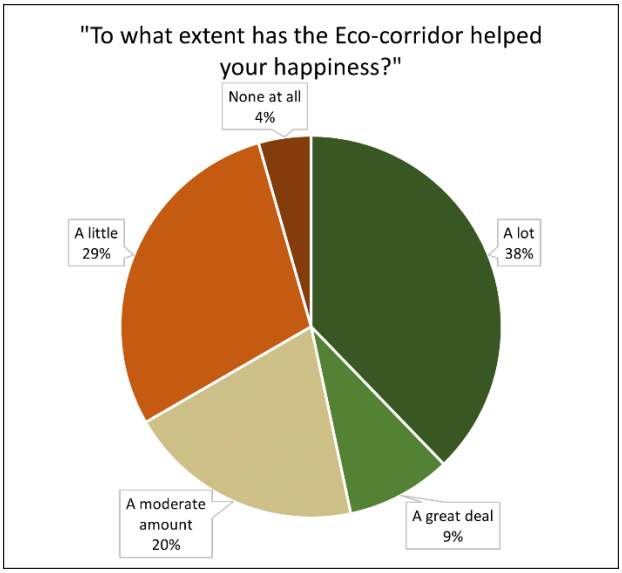


Figure 10.



Participants were asked "To what extent has the Eco-corridor helped your happiness?", the most popular response was "A lot" which accounted for 38% of the responses (See **Figure 11**). The Affect Balance Scale (ABS) was added to the Satisfaction with Life Scale (SWLS) to create a combined happiness score for each participant. These scores were then compared to participants' responses to the extent which the Eco-corridor has helped increase their happiness. A very weak positive correlation was observed (r2 = .1253), meaning that those which rated that the Eco-corridor helped "a lot" to increase their happiness, also had higher general happiness ratings (See **Figure 12**). However, using a Univariate Analysis of Variance (ANOVA) test, this correlate was not statistically significant (p>.05).

Figure 11.



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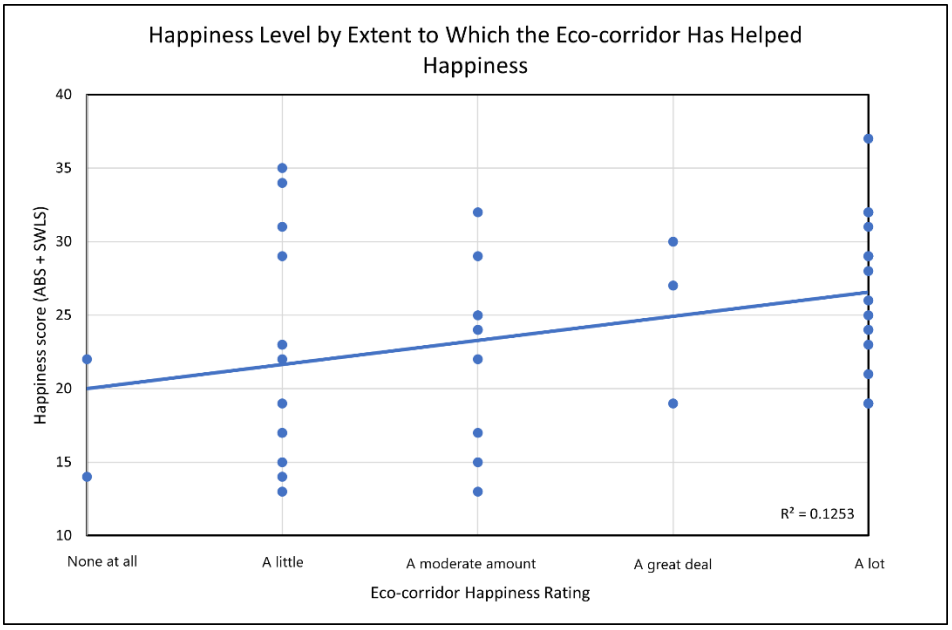
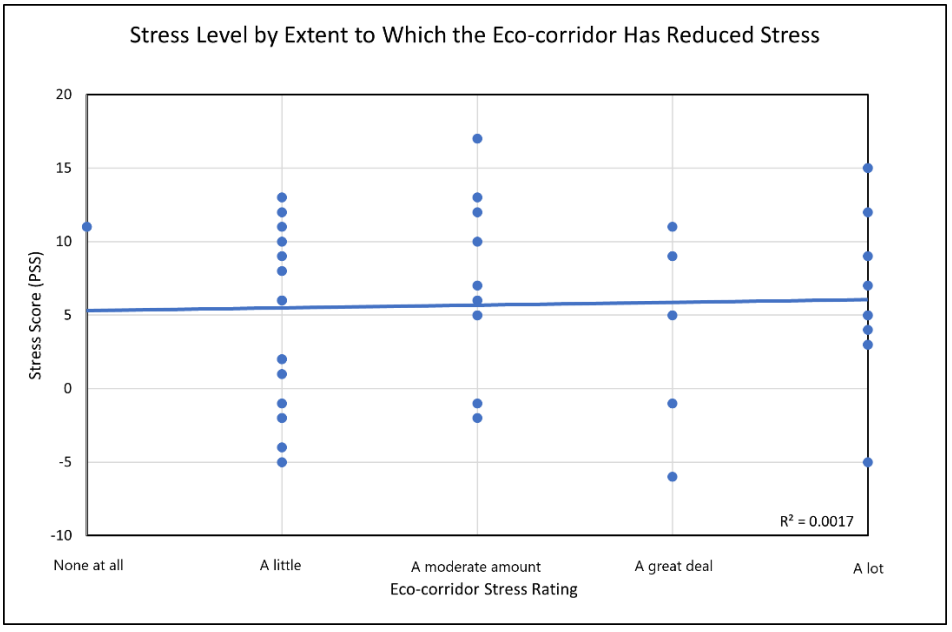


The Perceived Stress Scale (PSS) was scored, participants scores ranged from -6 to 17, these scores were then compared to participants' responses to the extent which the Eco-corridor has helped reduce their stress. No correlation was observed (See **Figure 13**).

Figure 13.



Discussion

This discussion is broken down into four parts: first, a brief discussion on the observational study's results, second, explanation of the survey's results, and third, limitations and implementations of this study, and fourth, the final conclusion.

Observational Study

The observational study component of this project provides a base line estimate of how many people utilize the Eco-corridor on a given day. The most important finding of this study was that on average 35 people visit the Eco-corridor every hour. Of course, this is just an average but if you multiply that by 10 to represent a range of 8am to 6pm, then 350 people visit the Eco-corridor every day. Also, interesting to note is that temperature, day of the week, and time of day were strong factors in determining how many people would visit in a certain hour. Meaning that there tended to be more people in the Eco-corridor on warm sunny days, usually on the weekends, and in the afternoon. This most likely relates to the activities which people use the Eco-corridor for, most likely less people want to walk, run, or bike through the Eco-corridor when it is pouring rain, or extremely cold, or when they have class or work. The largest demographic of users being non-student adults was not what had been hypothesized. However, this means that the renovation project was important not just for students but even more so for adults who live nearby, because they utilize the space more often than students do.

Understanding how many and which people use the space is important for management of the area and guidance of future additions. If more adults use the space then it would be important to hear from them about why they enjoy using it, what they would like to change, and how they feel about the proposed additions to the Eco-corridor. Not only is it important to understand the number of people but also the motivations and desired outcomes that visitors have (Rice, Taff, et al., 2020). Therefore asking individuals those individuals through the survey was an important step, but even deeper questions relating to the motivations could have been more effective.

Survey

The survey component of this project is the major piece to provide evidence of the Eco-corridor's effectiveness as a cultivated wild project. The first point which suggests this to be an effective project is that 82% of survey respondents answered that prior to the renovation project, they did not go to the Eco-corridor. After the renovation, every respondent had gone to the Eco-corridor at least once, with most people spending more than one hour per week there. Taking this statistic into account, this increased attendance in the Eco-corridor from 18% to 100% of participants. Most likely the individuals who responded they went to the Eco-corridor before the renovation had gone there as part of a class and not for recreational use. Based off this information, one could say that the Eco-corridor renovation has effectively provided a new space for outdoor recreational activities which had previously not been used for this purpose. However, this does not mean that individuals do not have other places to do their activities which they do in the Eco-corridor, only 2 individuals noted that they would never do the activity had the Eco-corridor not been restored. These activities ranged, but the most popular items walking, running, and wildlife observing follow the similar uptick observed by Rice et al. (2020b). Which suggests that this project is effective for the COVID-19 era because individuals have been searching for local places to go for a nature walk or run and just enjoy local nature spots. The Eco-corridor provides a spot for individuals to do this, which is especially important for urban and suburban areas that continue to lose touch with nature as land development increases (Berg et al., 2007; United Nations, 2012).

In terms of reducing stress and increasing happiness, the project was slightly influential in happiness but not stress. When asked about how much the Eco-corridor has increased their

happiness, the most popular response was “A lot”, and the majority of responses said “a moderate amount” or higher. Therefore, there is a perceived value of happiness that can be attributed to the Eco-corridor that cannot be accounted for by another factor. However, there was no correlation to this rating and their happiness score, which means that an individual who rated “A lot” did not necessarily have a higher happiness score in general. The lack of a correlation means that while the Eco-corridor can provide people with happiness, there must be other factors which contribute to happiness that the Eco-corridor cannot provide. Stress on the other hand, was irrelevant to the Eco-corridor, not many individuals believed that the Eco-corridor helped reduce their stress, and the rating which they gave was not correlated to their perceived stress score. This suggests that although the Eco-corridor can provide happiness effectively, it does not seem to provide as much stress relief. This result may be because college students are typically stressed throughout the semester and many find it difficult to reduce stress, but increasing happiness is easier for some students. This is not to say that the Eco-corridor cannot reduce stress, there are people who responded that it did in fact helped, but the majority of people did not attribute the Eco-corridor as a major stress reducer.

The proposed additions to the Eco-corridor provided mixed results. As previously stated, the top three most favored items were hammock pods, recliner/Adirondack chairs, and a fire pit. But there were 3 items that were not well liked as well, an outhouse/composting toilet, recreational guides/trip leaders, and birdwatching stations with binoculars. The rest of the proposed items fell somewhere in between, with individuals on both sides sharing opposing feelings. However, these findings are interesting, the top 3 choices seem to suggest that individuals want more tools which help them relax and enjoy the outdoor space. The addition of hammock pods and chairs could lead to individuals using the Eco-corridor as another study and workspace, similar to how the addition of Adirondack chairs outside the Boatwright Library has led students to work in a new space. Whereas the fire pit suggests that students wish for a space to relax with friends by a fire, potentially to cook food like marshmallows, which would add a component to campus that is currently nonexistent. On the other hand, individuals do not want an outhouse for this space, most likely because bathrooms are nearby, nor guides to the area, most likely because of the size of the Eco-corridor, individuals do not need guidance, nor birdwatching stations, most likely because it would be difficult to know where to place them. Therefore, this project has the following recommendations of items to be added to the Eco-corridor: hammock pods, Adirondack or lawn chairs, a fire pit, a treehouse, and a meditation area. These items were most favored from the list and show the best use of the space moving forward, allowing for additional activities in the Eco-corridor that currently cannot be done.

Limitations & Implementations

Observational studies like this one can be useful for getting a very basic understanding of frequency of use, but they have several limitations and design flaws. First, using random days and times can be useful in getting a random selection, but it is much less accurate than collecting data daily at all hours. Taking the limitation of one observer with limited time in account this was the most effective method available in the time frame of the study. If this information proves valuable to the governing body of the Eco-corridor, then further collection of daily visitors would be important. It would also be interesting to note how many visitors are regular users and how many are new or sporadic. Second, the use of identifying individuals through observation is flawed because of the observer bias, where one observer may mark each individual differently than another when determining age group, and the ambiguity of some individuals proves difficult

to observe. Third, there are two entrances to the Eco-corridor, so when observing from one end, individuals may come in through the other but not go all the way through thus being left unmarked but still present on the trail. Fourth and final, deciding to not observe during rain may have been helpful in keeping the observer safe, and makes logically sense that less people would have been there, it still leaves out the possibility of knowing how many individuals will use the Eco-corridor even when conditions are not ideal. Despite these flaws, the observational study supplies important data about daily usage that shows how popular the Eco-corridor currently is, an estimated 350 individuals per day using the trail is important for making decisions about whether or not the trail should be maintained. This data shows that regardless of the actual number of people who use the trail, there is use that most likely was not there before, and it is important for the Eco-corridor to be properly maintained to uphold this activity. It shows that people are using the Eco-corridor now because it has value to them, just as previous literature has suggested (Anderson, 1981; Jr et al., 1969; Ribe, 2002).

Although the survey provides valuable information to get a better understanding of the effectiveness of the Eco-corridor as a restorative cultivated wild project, there are some limitations and goals that were not met in the distribution of the survey. The survey was only given out to students via Spiderbytes and social media, which did not reach a large audience, and most likely was filled out by individuals with a passion for the Eco-corridor or the environment. This means that the survey most likely has collected a small subset of the UR student population that is not an accurate sample makeup of all students, an abundance of environmental majors and individuals who know a lot about the Eco-corridor (40 survey participants responded they were moderately knowledgeable or higher about the Eco-corridor). The survey would need many more responses than 45 to get a more accurate representation of the 3,000+ students at the University of Richmond. The survey was intended to be sent to faculty and staff as well as students, however, there was complications in sending out the survey through Spiderbytes and only students were sent the message. Getting faculty and staff perspective on this project would have been interesting as well, as they would most likely have differing opinions than students on the proposed additions and most likely would not attribute the Eco-corridor to increase their happiness since most do not live on campus and can utilize other outdoor areas closer to home. If local adults were given the same survey that was sent to students via Spiderbytes, then it would be interesting to know how many people would regularly go to the Eco-corridor prior to the renovation. This would then give a more accurate result as to the effectiveness of this project from turning a location from unkept wild to a cultivated one, the crux of this project. Most likely students who responded that they went to the Eco-corridor prior to the renovation went there for a class and not for the same use that they use it for now. But adults are less likely to have had a reason similar to class to go to the Eco-corridor for, and more likely did not know about its existence prior to the renovation. Getting this data would potentially give even more proof of the effectiveness of the Eco-corridor to use the space that they did not use before. Interesting questions to add to this survey would include how much COVID-19 and the new opening of the Eco-corridor has increased specific activities such as nature walks, running and others which can be done in the Eco-corridor because it is a nature spot. One would expect to find similar results to Rice et al.'s (2020, 2020a, 2020b) three-part survey, finding that local activities such as walking around the block have increased and the new opening of the Eco-corridor has become a popular spot for walking around. Another interesting question would be whether individuals feel the ability to use the Eco-corridor and its easy access have a positive effect on reducing the

feeling of burnout discussed by Queen & Harding (2020), especially from “COVID/Quarantine burnout”.

Conclusion

The effectiveness of the Eco-corridor as a “cultivated wild” renovation project to enhance human health and interaction in the area is a difficult question to answer. However, the results of this study suggest that the Eco-corridor’s restoration has led to a major increase in daily visitation, adding to many students’ happiness, and provided some students stress reduction. The project has effectively given individuals at the University of Richmond and its neighbors a new space to do some of their favorite outdoor recreational activities and to explore some new ones. Listening to the suggestions of students, this paper has highlighted some proposed additions which may enhance the effectiveness of this project. The opening of this project could not have been timelier, providing city people an appropriate nature space to breathe and relax from the stress of the COVID-19 pandemic. Projects like the Eco-corridor are necessary for human health as cities continue to expand and infrastructure develops, nature provides an essential restorative space for all and the Eco-corridor exemplifies what it means to cultivate the wild.

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