

Can Viewing Landscape Paintings Reduce Stress?

The pandemic has exponentially worsened the emotional health of individuals across the board, from stress-filled environments for front-line workers and employees of essential industries, to housebound elderly, educators teaching on-line, and students learning from home. Nature exposure has been associated with stress-reduction, but can landscape paintings—a nature surrogate—deliver the same effect?

This study compares the ability of nature viewing in a live setting (a Frederick Olmsted-designed Park – see photo Figure 1) with nature depicted by historically important landscape paintings from the Hudson River School by artists including Frederic Church at the New Britain Museum of American Art in central Connecticut (see Figure 2 for an example). Landscape paintings such as those in the Museum’s permanent collection continue to draw admirers to their wondrous, sublime, and, frankly, relaxing evocation of natured spaces. This study engaged research participants in gallery viewing of Hudson River landscape paintings on display and in viewing live nature from the Museum’s outdoor terraces to help understand whether people could derive similar benefits of stress-reduction and attention restoration from the proxy nature representation as from experiencing live nature in situ.

Approach

Visitors to the museum were informed of the study being conducted as a participatory art-as-science lecture. A total of 33 study participants were self-selected and agreed to wear the NeuroLynQ biometric sensor throughout the lecture experiment to monitor

their galvanic skin response (GSR) levels. Participants were randomly assigned to one of two sides of the lecture room, which determined the order of treatment.

Participants were exposed to a five-minute montage of New York City traffic designed to simulate a stressful experience. After exposure to the traffic montage, one treatment group moved to be seated in a nearby gallery in the museum to observe landscape paintings for seven minutes, while the other group moved just outside the lecture room to sit in an actual outdoor landscape for seven minutes. After the viewing period was over, participants returned to the lecture room for a five-minute reset. After the reset, participants were exposed to the traffic montage again for five minutes, and then the groups swapped landscape observation settings, with the first group going outside to experience the outdoor landscape for seven minutes and group two going to the gallery to observe landscape paintings for seven minutes under the same conditions as before.

The NeuroLynQ system allowed for very quick analysis. Each group was monitored by a separate Shimmer NeuroLynQ system which provided real-time analysis



Figure 1: Park designed by Frederick Olmsted



Figure 2: Frederic Edwin Church, West Rock, New Haven, 1849, New Britain Museum of American Art, John Butler Talcott Fund, 1950.10

of the response rates of the group. Response rates were calculated by analyzing the galvanic skin response of each participant and classifying their response in three levels: none, some, and high. The individual results were then aggregated by calculating the percentage of the audience in each category at each moment.

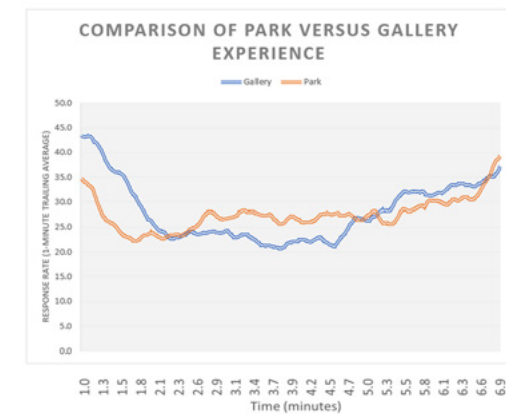


Figure 3: Comparison of park and gallery experiences

Results

The analysis of data from this study is ongoing, and the results are planned to be published in a peer reviewed journal. However, the technology used provided analytics in real-time, allowing us to share some qualitative observations here. The real-time analytics are based on the percentage of the audience having a measurable reaction at any given time (response rate). Figure 1 shows a comparison of the two experiences (park versus gallery) with a one-minute trailing average of the response rates.

Our qualitative observations include:

- **No order effects.** The experience of both groups appears to be quite similar, suggesting that order effects in the exposure were negligible.
- **Traffic videos are not relaxing.** Not surprisingly, the response rates were higher for the traffic videos than either the park or gallery.
- **Park and gallery are similarly relaxing.** In both the park and the gallery environments, participant responses rates initially increased as they were settling in and then dropped, suggesting similar stress-reduction patterns.
- **It took longer to relax in the gallery.** It seemed to take longer for the participants to relax in the gallery. Perhaps the gallery was a less familiar environment, even for a museum-going audience.
- **The gallery's lower response rates after the initial period suggest deeper relaxation.** Perhaps this is because the gallery was truly static, whereas there was movement in the park, both from wind and people moving in the distance.
- **Over time stress reduction returns to baseline with both experiences.** This may well have been an anticipatory effect as people knew there was a specific time limit for each experience. However,

the effect was earlier and more pronounced in the gallery. Two explanations may account for this mid-point increase in the gallery GSR: either boredom with a completely static environment, or—as was expressed by some study participants in a post-experiment talk-back—the initial overall viewing of the painting was followed by more stimulating scrutiny of details.

Cognitive processing of art occurs in stages, where a comprehensive digestive phase of the work gives way to minute processing of individual details which make up the whole. The original relaxation phase can be overridden by an active cognitive uptake phase to a positive level of stimulus-response. This type of response is called affect circumplex and is well documented among art viewing participants.

Conclusions

Several conclusions are suggested by these observations:

- Natural landscapes and landscape paintings seem to have similar stress-reducing effects.
- Over time, these effects may wear off.
- The addition of some movement/change may extend the relaxation effect.

These analyses are based on an exploratory study using the NeuroLynQ real-time metrics. As such they need to be confirmed with additional statistical analysis of the raw data and additional studies. However, at a minimum, having the very quick results is useful for directional analyses and generating hypotheses to explore more completely with rigorous statistical work.

Final Thoughts

Most of the research on the health benefits of spending time in nature has taken place in urban greenspace or has experimented with futuristic versions of nature facsimiles like VR or augmented reality. This study reaches backward to test whether a medium that predates photos can offer stress relief. For people disinclined to go outdoors for reasons of physical ability, proximity, or just plain dislike, GSR demonstrated that Frederic Church had the same impact as Frederick Olmsted! Future research directions might test synthetic nature among broader audiences beyond older museumgoers, or those working or living in institutional settings, or break areas in hospitals and schools.

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