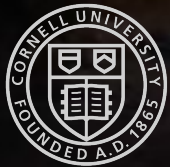
A photograph of a courtyard at sunset. The sun is low on the horizon, casting a warm orange glow over the scene. In the foreground, a large, circular fountain is visible. People are gathered around the fountain, some sitting on the edge. The courtyard is surrounded by buildings with dark roofs. The sky is a mix of orange and blue.

# Participatory Design: Tool for User Experience Assessment & Spatial Programming



**DESIGN+**  
Environmental  
**Analysis**  
Cornell University

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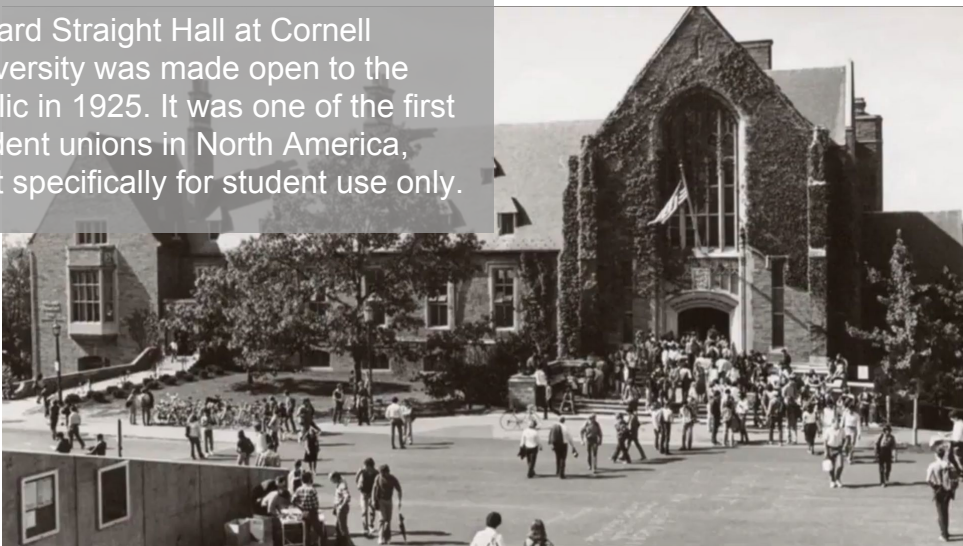
So-Yeon Yoon  
Associate Professor, DEA  
sy492@cornell.edu

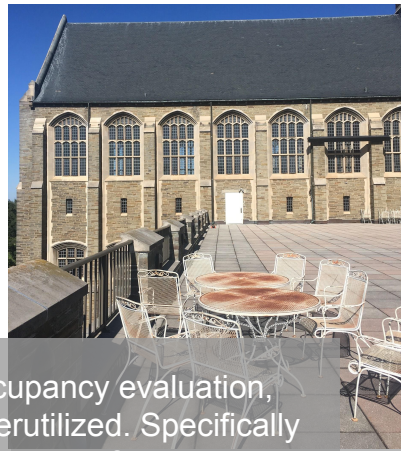




*"Make Cornell a more "human place" [&] build a student union building."  
--Willard Dickerman Straight*

Willard Straight Hall at Cornell University was made open to the public in 1925. It was one of the first student unions in North America, built specifically for student use only.





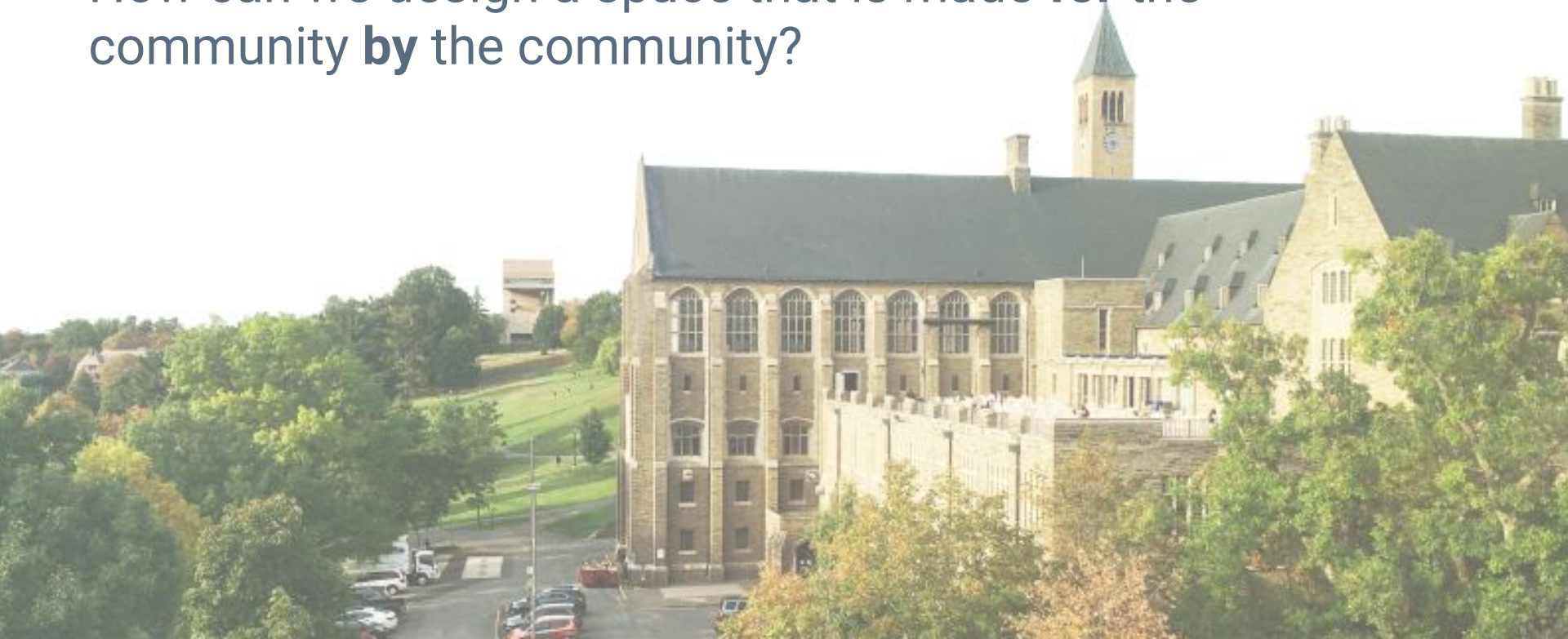
Now it's 2018, after performing a post-occupancy evaluation, the space has been found to be very underutilized. Specifically the terrace space in the back is closed for most of the year because of seasonal changes, furniture is rusted and heavy, and there's not enough places to sit.

However, it still provides a beautiful view of Ithaca, NY, serves as an escape from the stresses of school, and shows potential for reviving the initial goals of the space.



# Design Question

How can we design a space that is made **for** the community **by** the community?



# Process Overview

The design intervention of Willard Straight Hall--Terrace undergone three main design phases. Each phase emphasized participatory design; essentially including as much community input as possible. The hypothesis was, **if the Cornell community is given open opportunities to express personal changes to Willard Straight Hall, then the produced design intervention would improve place attachment and attendance on campus.**

## Design Charrette

### Evaluate Campus Culture

Student Location Preferences

Place attachment survey



## Intervention

### 2-Day Pop-Up Event

Place attachment survey

Behavior mapping & traces

Interviews



## Post-Survey Analysis

### External Effects

Social media

*Future Work*



# Phase 1

## Design Charrette

### Participatory Design

*Goal:* Expose public to preliminary ideas and gauge perception

### Measures

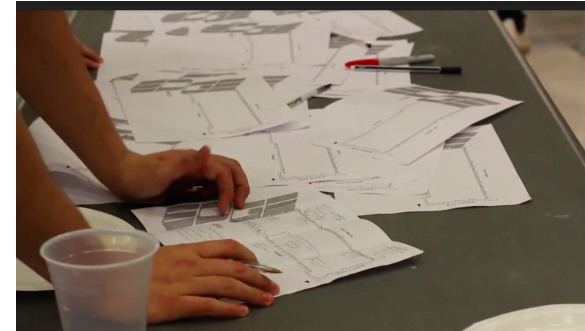
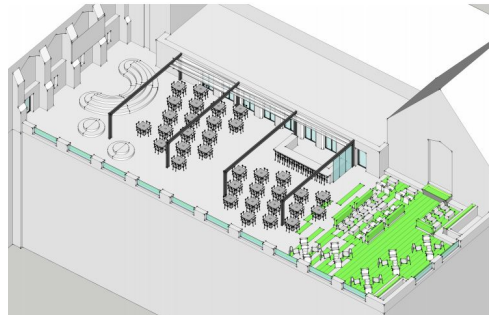
Student Location Preference on Campus

Virtual Reality Experience

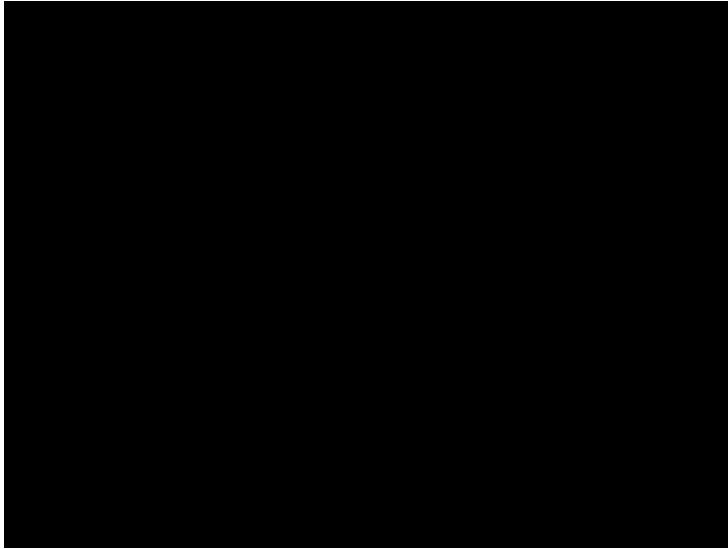
Place Attachment Survey



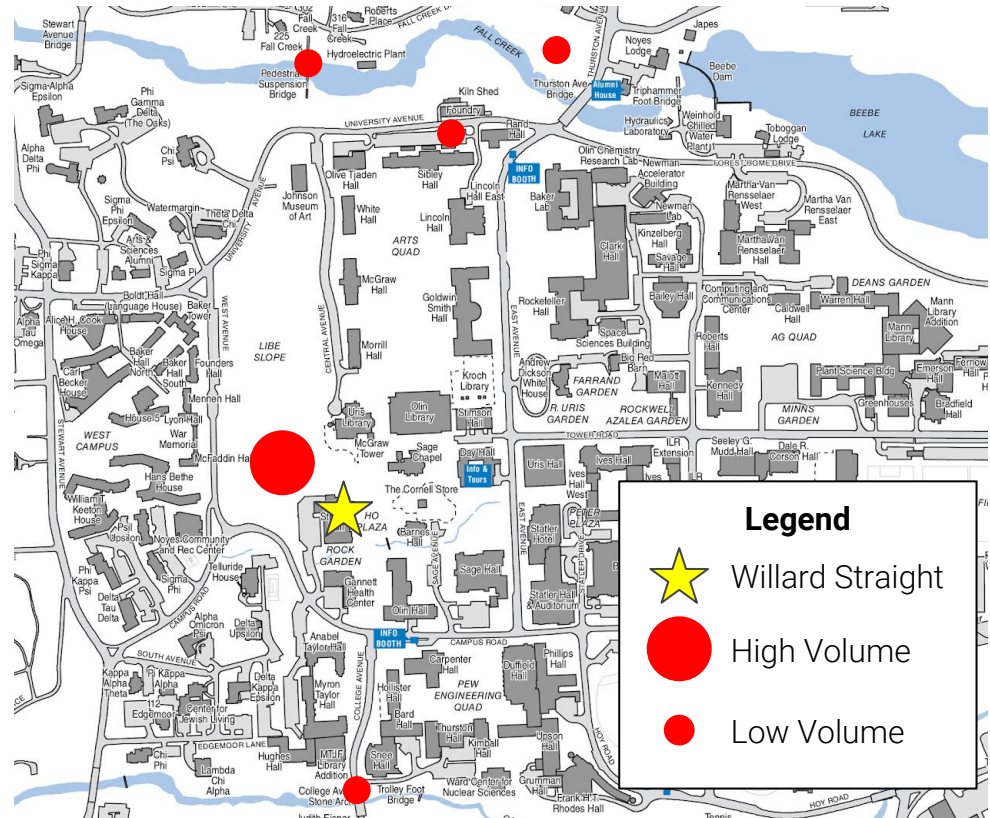
SUMMER LAYOUT



# Design Charrette



## Students Location Preference on Campus



## PARTICIPATORY DESIGN





# Phase 2

Design Charrette

Intervention

## 2-Day Pop-Up Event

Observation/Informal Interviews

Physical Traces

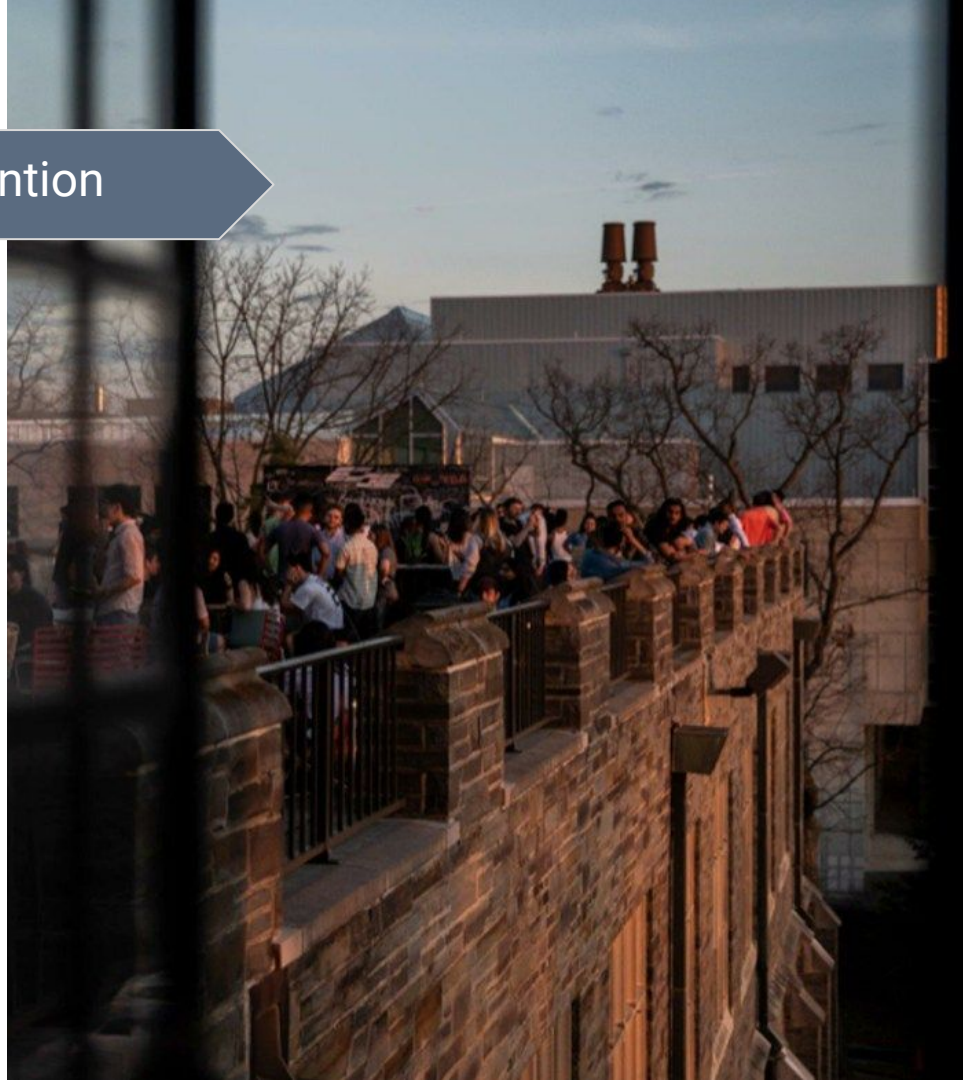
- Heat Mapping

Place attachment survey (n=58)

- 5-point Likert scale  
*\*Raymond, Brown, & Weber's (2010)  
place attachment questionnaire*

Attendance

- Demographics
- Beverage sales





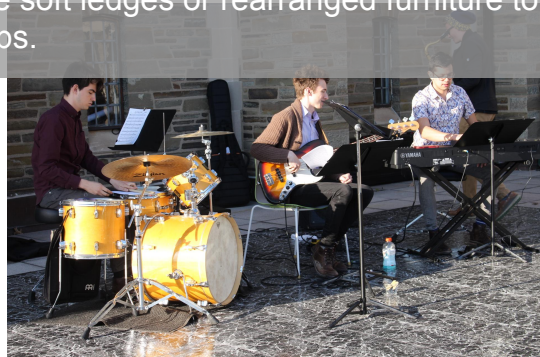
On April 30th and May 1st, students and community members from all walks of life came together at Willard Straight Hall--Terrace to indulge themselves with friends, strangers, outdoor activities, a cash bar, live performances, and the sun.

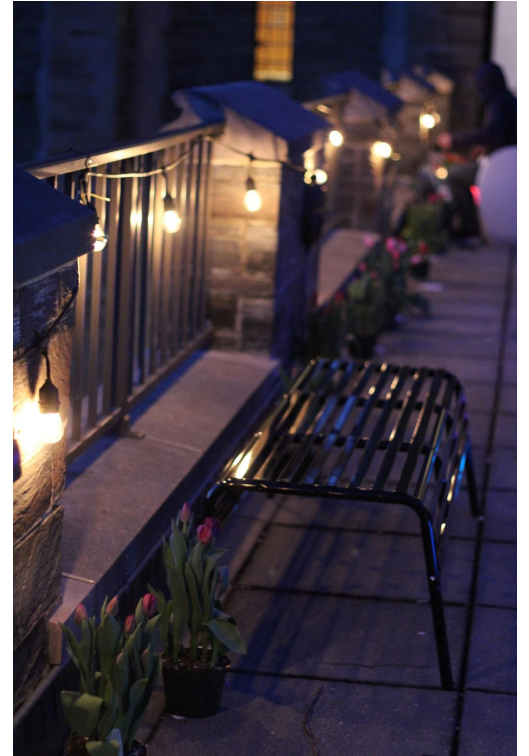
Over 900 people came and went across this two-day pop up event. The furniture and activities were ideas created by students from the Design Charrette.





Students and community members brought their own lunches to the terrace. When they couldn't find a seat, they made the most of the soft ledges or rearranged furniture to fit their friend groups.





# Physical Traces

Furniture was utilized wherever it was accessible which created a myriad of different types. A clear egress line was also eliminated.

Before



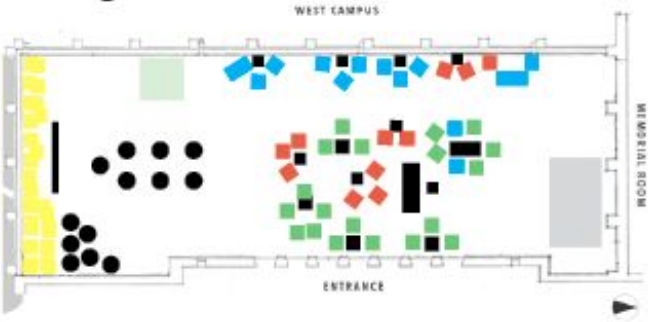
During

Heat Map Surveillance

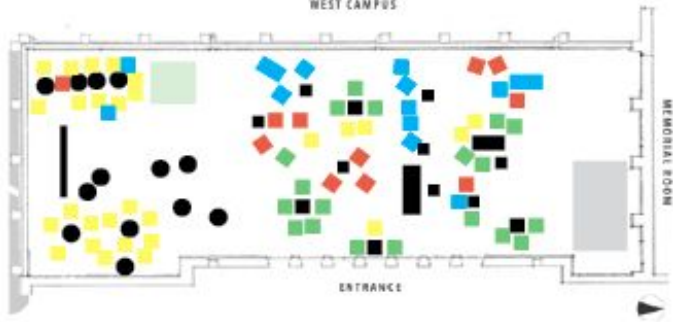


Seek Thermal CompactPRO

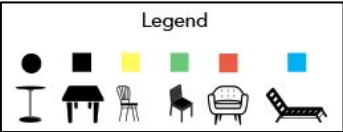
After



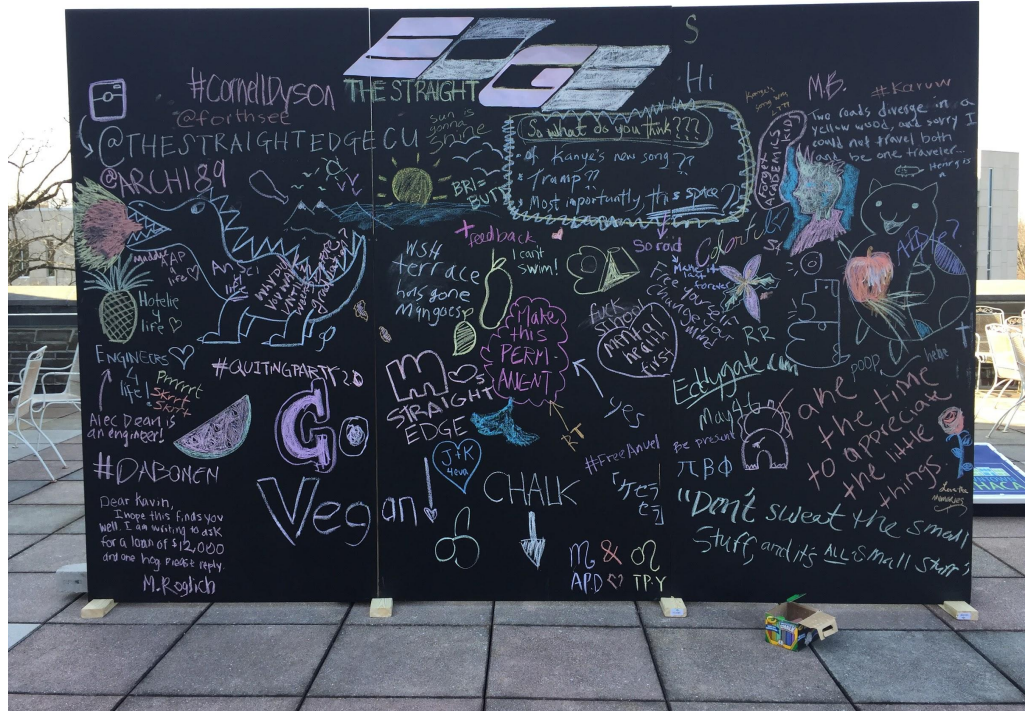
Environment | Static



Environment | Dynamic



# Physical Traces



# Place Attachment Analysis

## Participants

58 total participants (39 female, 18 male, 1 other)

- **67%** female, 31% male
- **80%** students
- **100%** have been to Willard Straight before

## Conditions

1. Charrette
2. Intervention Day 1
3. Intervention Day 2

## Place attachment survey

- Between-groups one-way analysis of variance (**ANOVA**) with **Tukey HSD**
- **Three-way full factorial model**  
Respondent variables (i.e. gender, age, experience on campus) x the four place attachment dimensions.

Table 3 Place attachment variable by environmental condition

	Degrees of Freedom	Sum of Squares	Mean Square	F ratio	Significance Prob>F
Place Identity * Condition	2	2.906	1.453	0.617	0.5430
Nature Bonding * Condition	2	23.059	11.529	4.944	0.0106*
Place Dependence * Condition	2	20.626	10.313	4.044	0.0230*
Friend Bonding * Condition	2	10.030	5.015	2.525	0.0893

Tukey HSD reported both **nature bonding** ( $p < 0.007$ ) and **place dependence** ( $p < 0.02$ ), had a significant effect on place attachment when compared to Phase 1 and Phase 2 (Day 2)

Table 4 t-test evaluating interaction between place attachment variables and gender.

	T-ratio	DF	Prob>t
Place Identity by Gender (Environment 2—dynamic)	2.282	7.117	0.0279*

\*\*Males scored significantly higher on place identity in

Phase 2 (Day 2)

# Attendance

**67%** female, 31% male

**80%** students

**~900** people in total  
attendance

## **Beverage Sales**

Day 1 | April 30

275 wristbands

360 bottles of beer sold

336 glasses of wine sold

Day 2 | May 1

400 wristbands

360 bottles of beer sold

288 glasses of wine sold

*\*\*1 hour of no sales, over limit for capacity by Cornell Dining*

**Total Wristbands: 675**



# Phase 3

Design Charrette

Intervention

Post-Survey Analysis

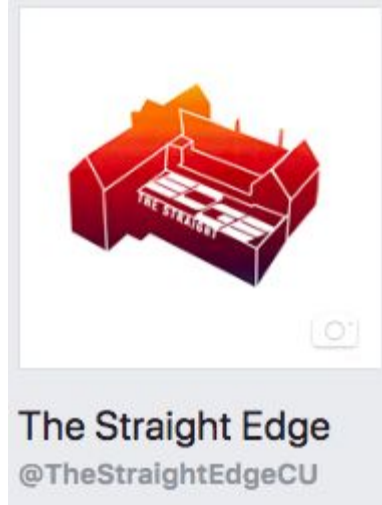
## Post-Analysis Evaluation

### Social Media

- Facebook Marketing
- Facebook Live
- Instagram

### Employee Interviews

- Key stakeholders



## Future Work

Full implementation

Post Occupancy Evaluation (POE)

Place Attachment Assessment

Campus Evaluation

- Mental health
- Community engagement

# Social Media



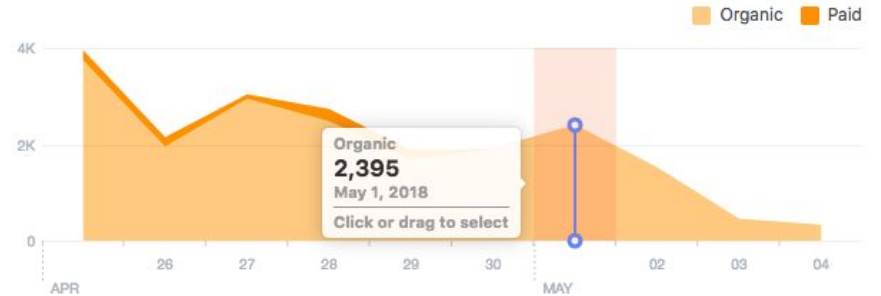
**morgan.n.cohen** • Follow  
The Straight Edge

morgan.n.cohen Pop up bar at Willard Straight was pretty cool — though my facial expression reveals my slight discomfort of taking photos in front of a large sum of people, but golden hour on the slope compels me to bring my camera #fujifilmxt1

93 likes  
MAY 2

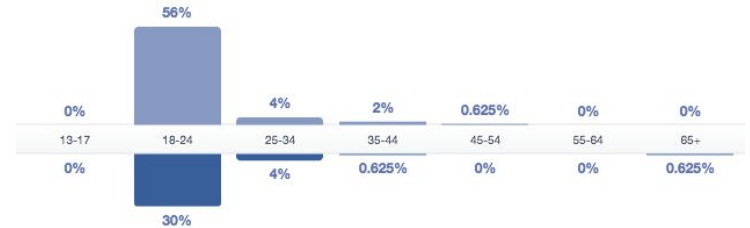
## Total Reach

The number of people who had any content from your Page or about your Page enter their screen.



## Women

63%  
Your Fans



# Discussion

## Results


- Old vs. New Environment  
Tukey HSD reported both **nature bonding** ( $p < 0.007$ ) and **place dependence** ( $p < 0.02$ ), had a significant effect on place attachment (Phase 1 vs. Day 2)
- **Males** scored significantly higher in **place identity** on Day 2 ( $n=20, t < 0.02$ )

## Design Guidelines

- **Nature bonding** and **place dependence** (fit within environment) are variables that need to be considered for student activity centers
- **Participatory design** that involves physical and virtual experiences are effective for improving place attachment in student activity centers

## Future Work for Place Attachment

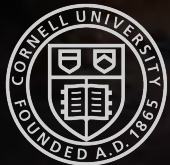
- The four dimensions were highly correlated; consider other measures
- Post-place attachment evaluation, test for longitudinal effect



# Participatory Design: Tool for User Experience Assessment & Spatial Programming

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