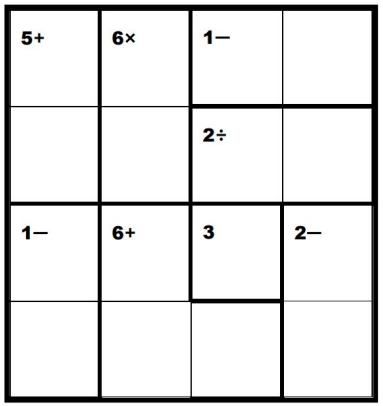
AP Psychology

Does surrounding beauty have an effect on test performance?

Parameters

- Independent variable: surrounding beauty
  - I identified four components of beauty (more on next slide)
  - Decorations and organization of objects would act as treatments
- Dependent variable: test performance
  - To measure, I used a KenKen puzzle
    - Independent from prior knowledge or classes
    - Relatively unknown
    - Varies based on external conditions
- 2 groups: 16 participants each
  - Across all grades, if possible (not recorded)
  - Convenience samples from lower cafe



Components of Beauty

Life

free beauty:
not influenced by
conceptions of its purpose

Art

dependent beauty:
influenced by conceptions
of its purpose

Color

strong historical
associations with beauty

Order

strong historical
associations with beauty

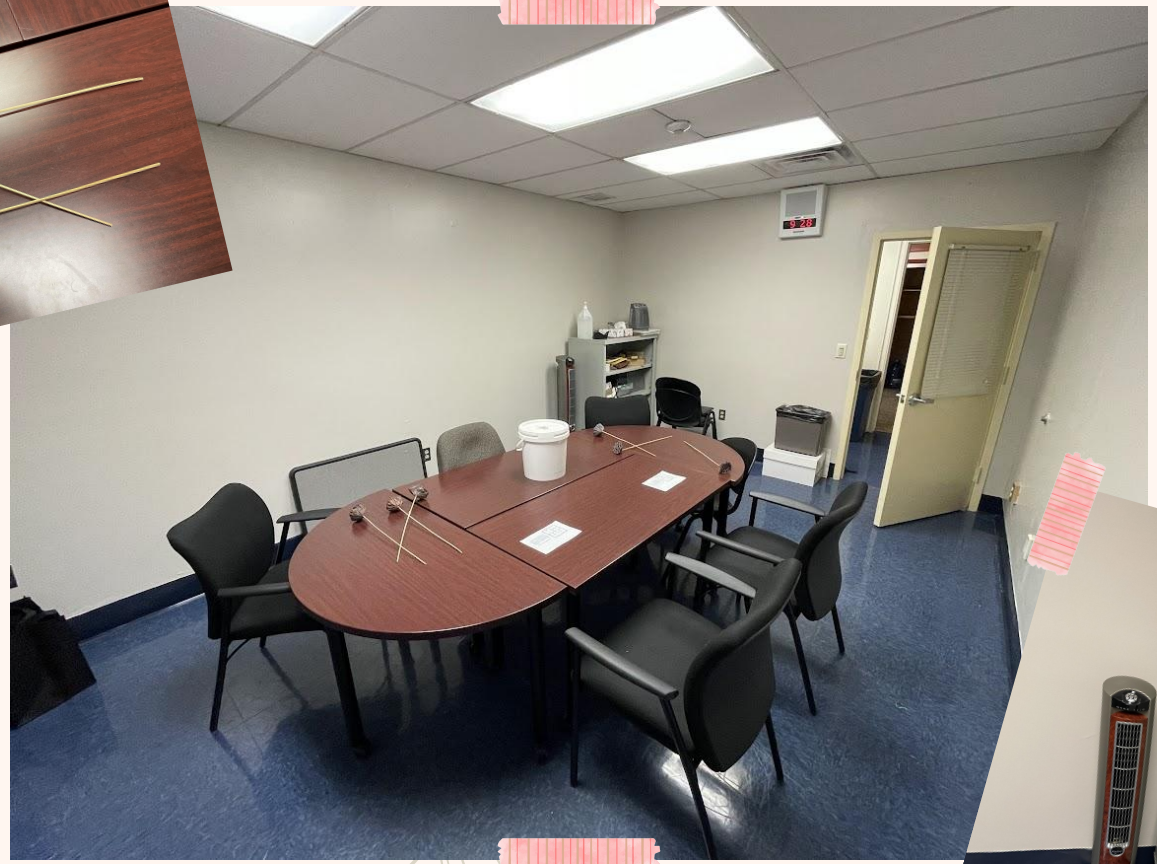
Hypothesis:

if a student's surroundings include elements of beauty, then they would perform better on an academic test.

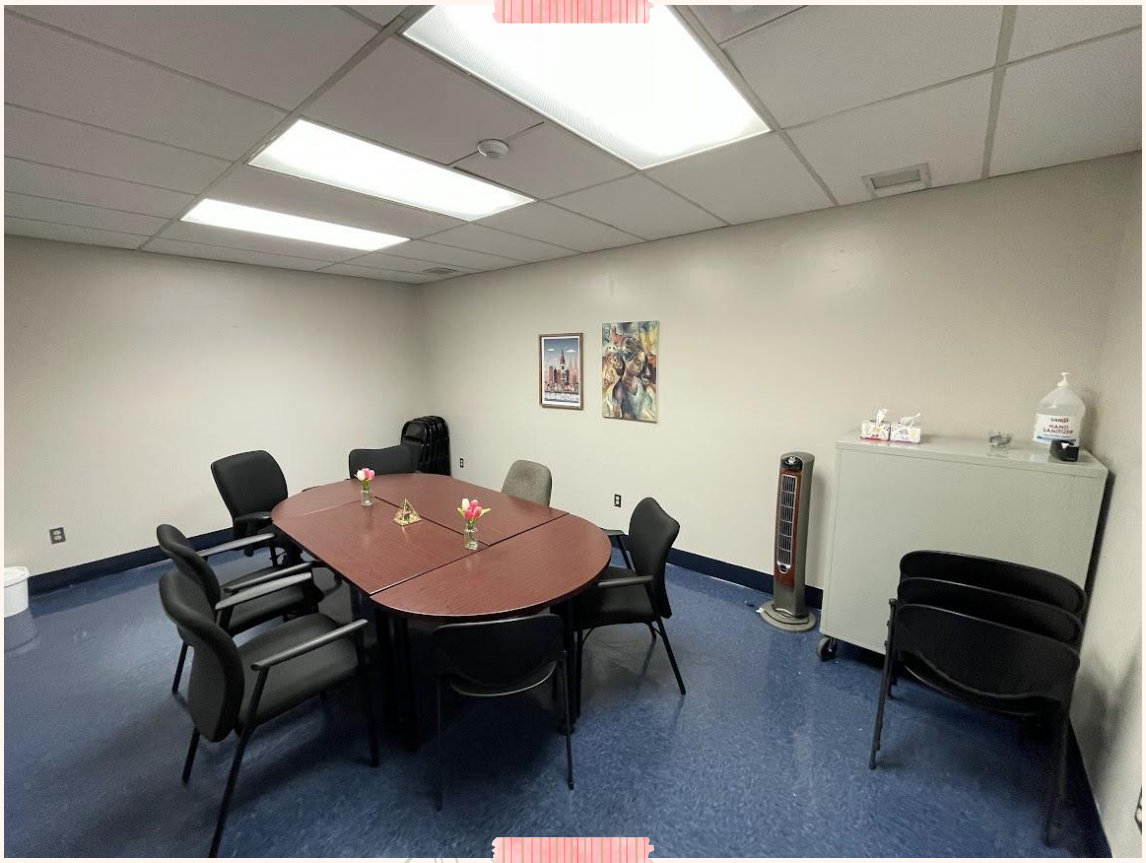
Experimental Design

Room 119

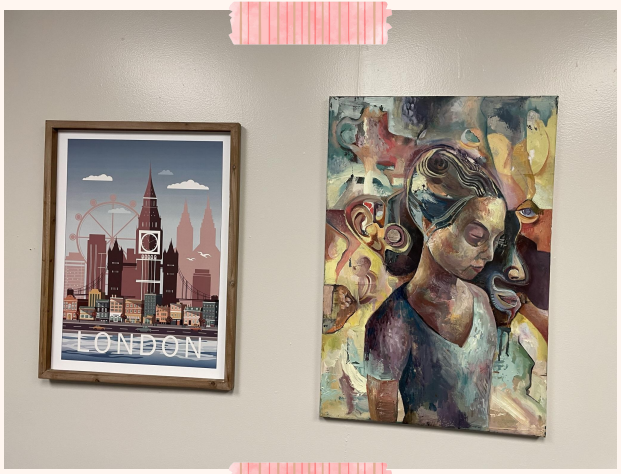
- Conference room
- Blank, able to decorate
- Low levels of noise and outside distractions
- No prior mental associations



The “ugly room”



The “beautiful room”



The “beautiful room”

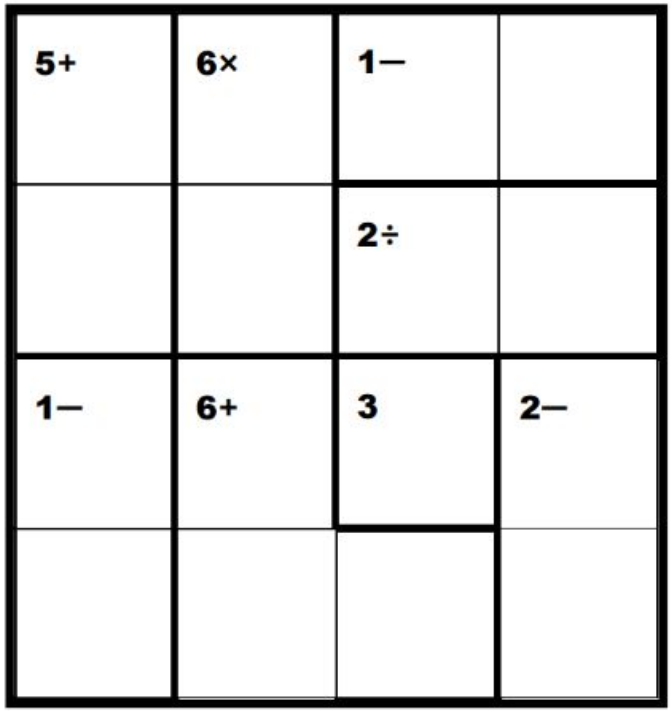
Procedure

- In pairs for expediency; no names were collected
- First asked if they had any prior knowledge of the puzzle in front of them, which was called a KenKen puzzle.
    - One participant from each group had recognized the type of puzzle, but neither had any prior knowledge as to how it was completed.
- Given a brief verbal description of the rules of the puzzle, and an opportunity to ask questions.
    - All instructions were also listed on the puzzle sheet.
- Informed that they had five minutes to complete the puzzle, and directed to note the analog clock to their right.
    - All participants received the same puzzle.

Group: _____

Your goal is to fill the whole grid with numbers. Every row and column should contain every number 1, 2, 3, and 4. In the heavily outlined areas (“cages”), you have to reach the number in the corner using only the operation in the corner. Cells with no operations given are freebies, you can just write down the number already given in the corner.

You have 3 minutes to complete the puzzle.



KenKen puzzle sheet given to participants.
The “3” in the last sentence was crossed out to write “5”.

Procedure (cont.)

- Puzzles were collected, given a second sheet of paper to report the beauty of the room on a seven-point scale.
    - Intended to verify that participants indeed viewed the “beautiful room” as being more beautiful than the “ugly room”
- Beauty score sheets were collected, participants were debriefed on the purpose of the experiment and given an opportunity to ask questions.
- Instructed to not share information regarding the objective of the experiment
    - They could report to peers that they had to “complete a logic puzzle”

Group: _____

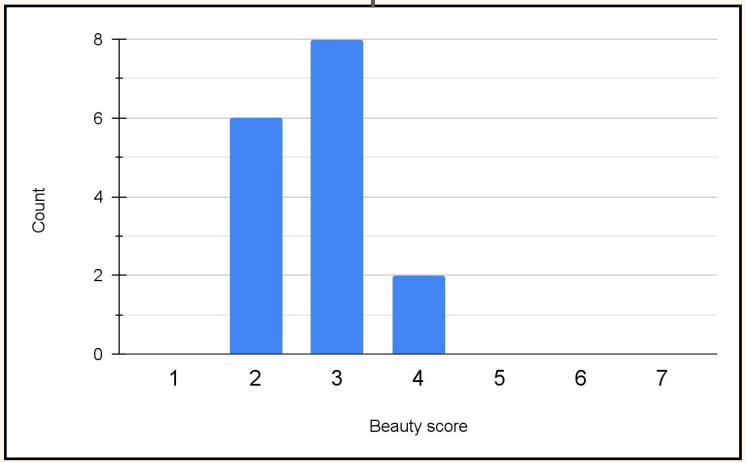
In terms of beauty, how would you evaluate the room you are in?
(1 being ugly, 4 being neutral, 7 being beautiful)

1	2	3	4	5	6	7

Beauty score sheet given to participants

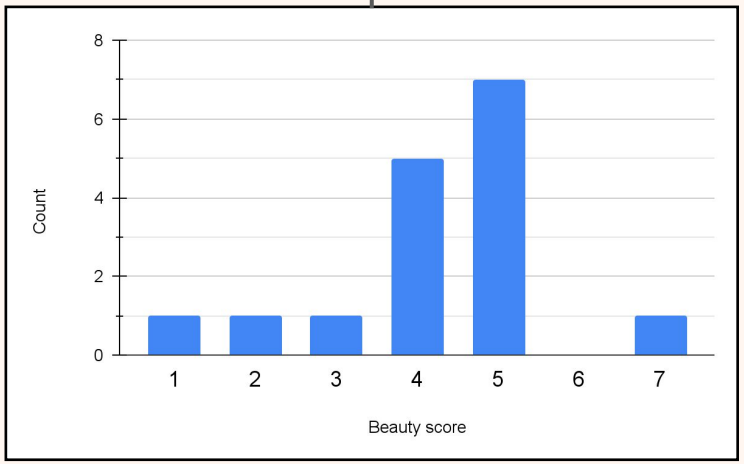
Results

p<0.001



Distribution of beauty scores for the “ugly room”

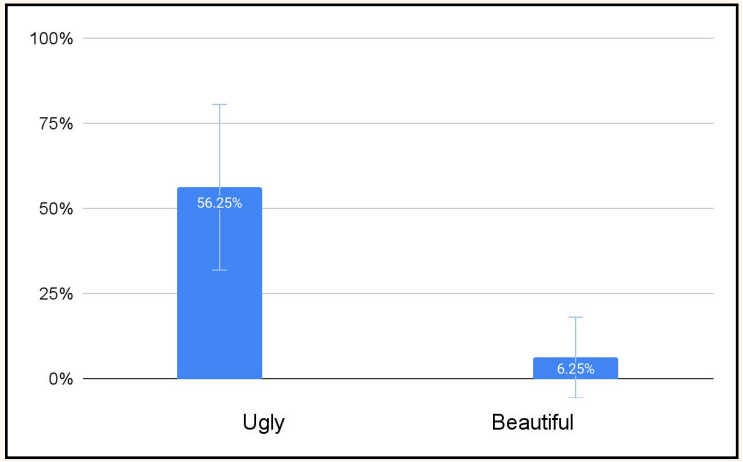
Average = 2.75

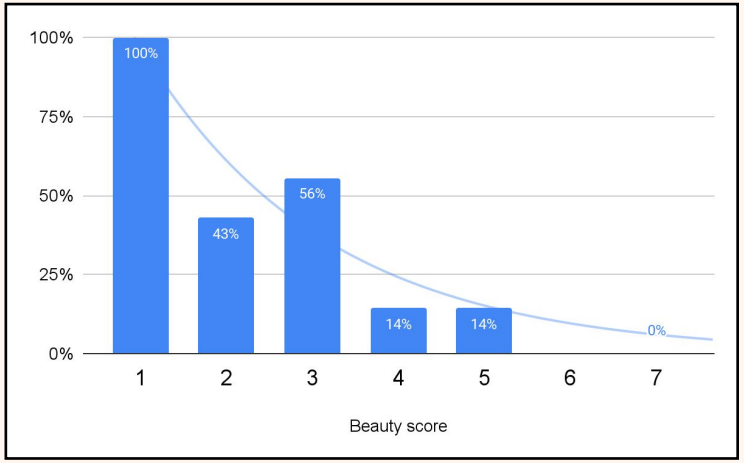


Distribution of beauty scores for the “beautiful room”

Average = 4.25

p=0.002





Proportion of puzzles correctly completed in each room

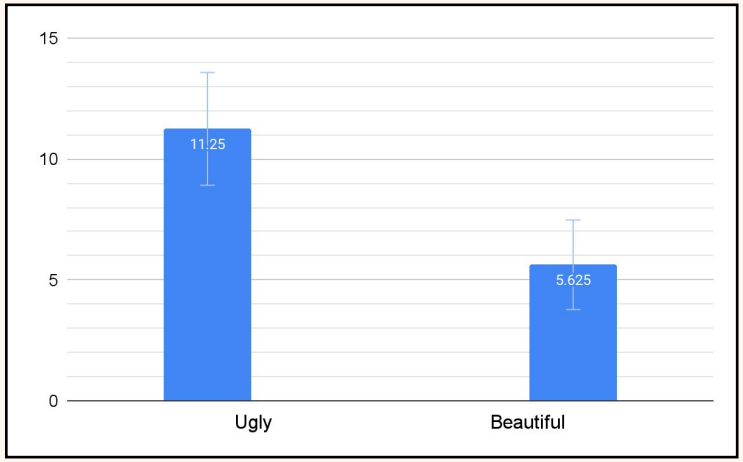
Bars depict 95% confidence intervals

Proportion of puzzles correctly completed for each beauty score

$y = -0.971e^{-0.464x}$

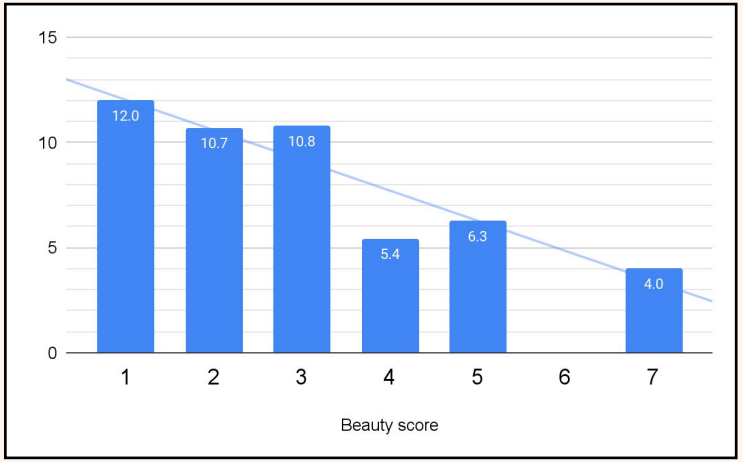
$R^2 = 0.892$

p=0.002



Mean number of cells correct in each room, out of 15 possible cells

Bars depict 95% confidence intervals



Mean cells correct for each beauty score, out of 15 possible cells

$y = -1.44x + 12$

$R^2 = 0.854$

Conclusion

Confounding variables?

Different times

Ugly room:
Periods 2–4,
Tuesday, May 17

Beautiful room:
Periods 4 & 5,
Thursday, May 19

Beauty scores impacted by performance

Because evaluation of beauty happened afterwards

Hypothesized confounding impact was not observed

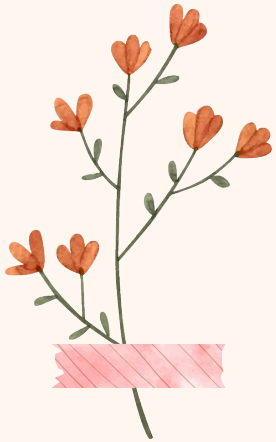
Not a confounding variable for relationship between rooms

IB French

An IB French test was occurring in a nearby room during the latter portion of the collection for the beautiful room.

May have impacted comfort or focus

The experiment provided convincing evidence that the inclusion of elements of beauty in one's surroundings **hinders** test performance.



Thank you!