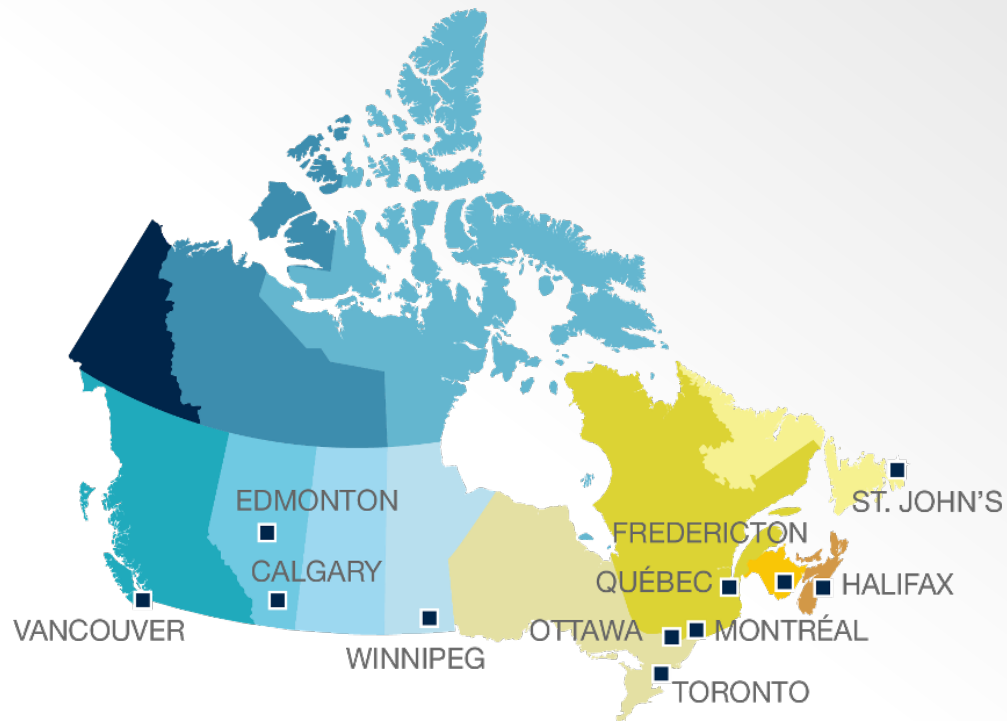


Change it up: Inactivity and Repetitive Activity Reduce Creativity

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2019 Times Higher
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Rankings: 251–300

2020 QS World University
Ranking: 211

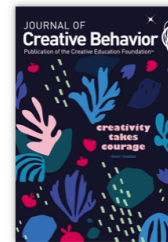


Original Article

Change it Up: Inactivity and Repetitive Activity Reduce Creative Thinking

Kelley J. Main, Hamed Aghakhani ✉, Aparna A. Labroo, Nathan S. Greidanus

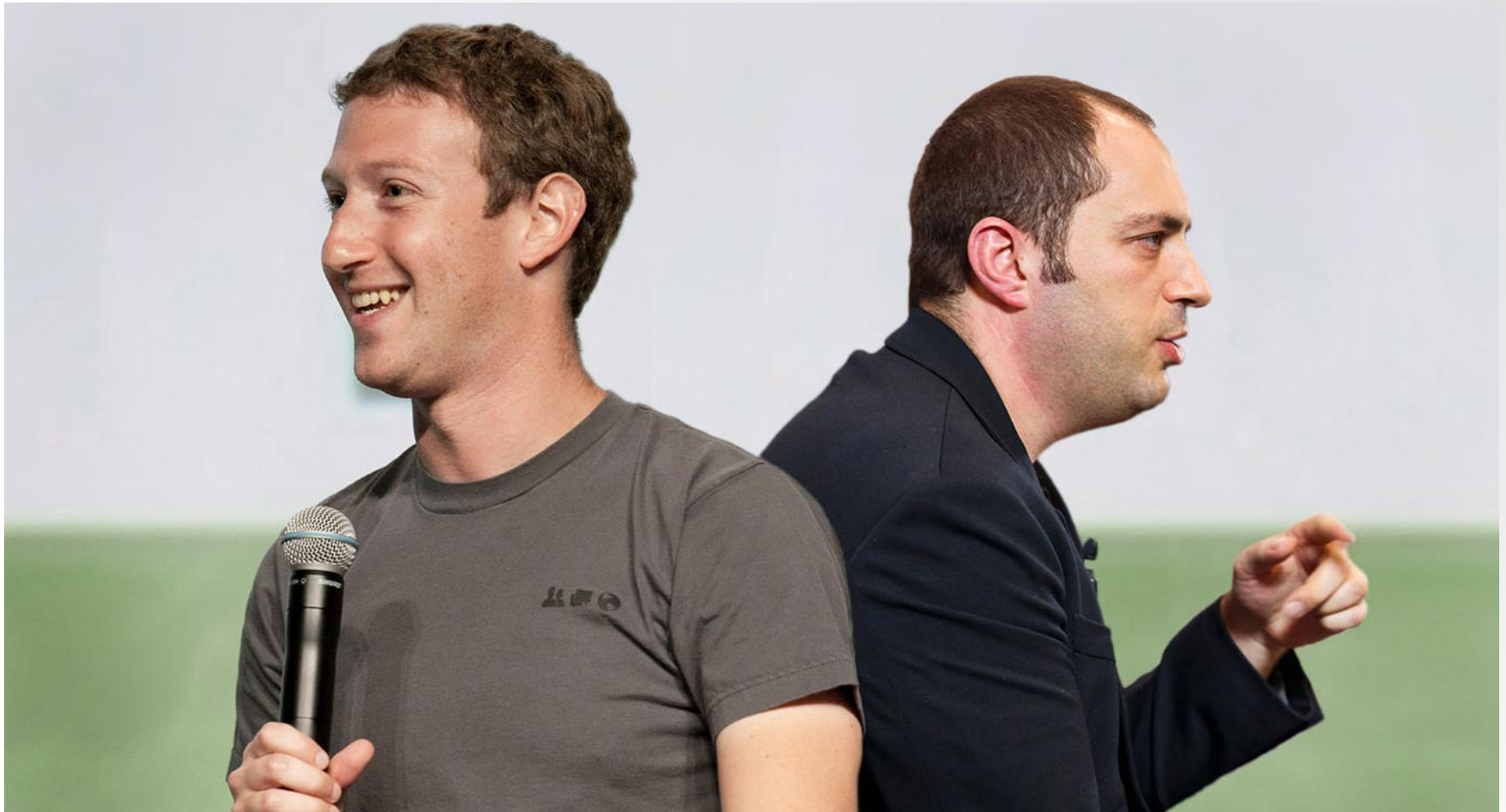
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Without change there is no innovation, creativity, or incentive for improvement.
William Pollard

Exercise improves not just physical health (Warburton, Nicol, and Bredin 2006)

- but also mental health (Lautenschlager et al., 2008)
- and creativity (Blanchette, O'del & Michael, 2005).
 - participants who engaged in aerobic exercise were more creative on tests of divergent thinking.
 - Opezzo and Schwartz (2014) similarly found that participants who walked as compared to those who sat showed enhanced creativity on the Guilford's Alternative Uses test.

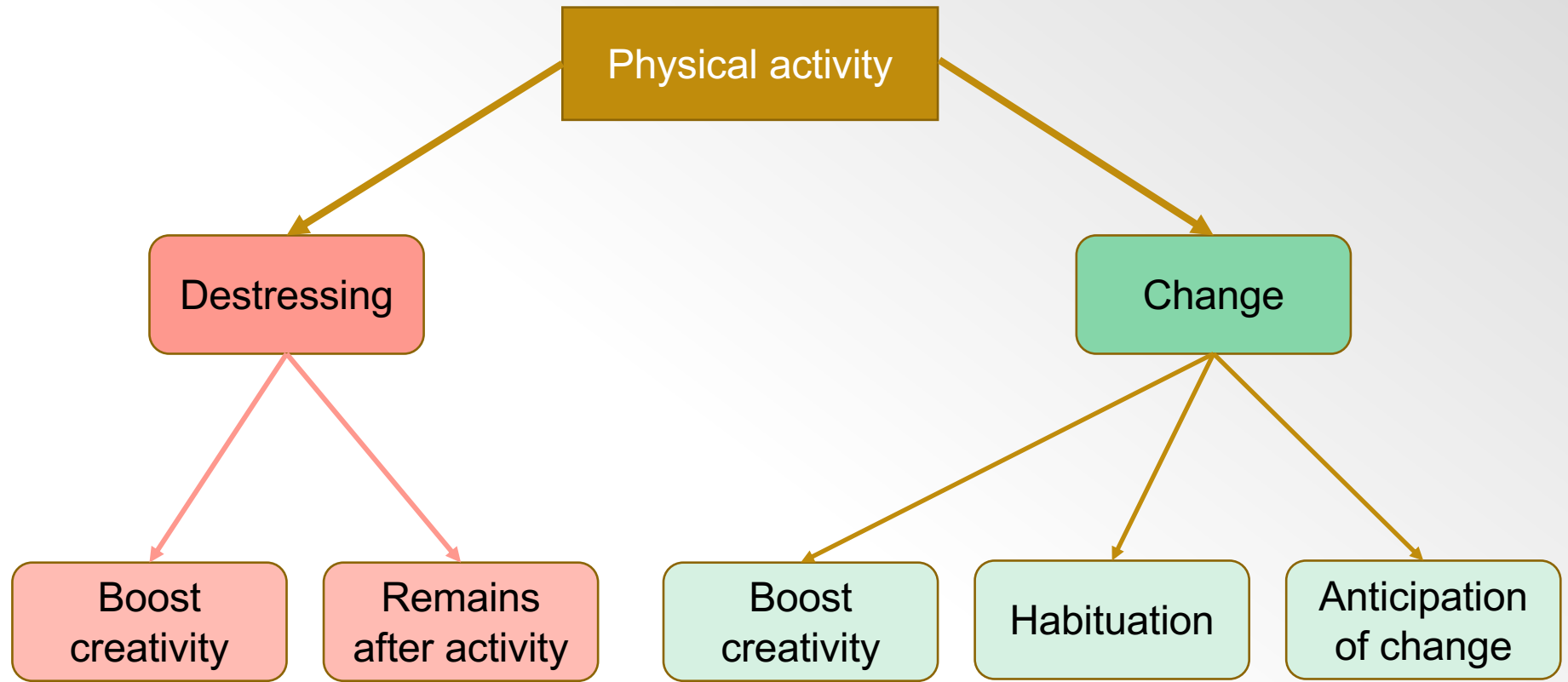


Physical activity and destressing

- Reducing stress (Hamer & Chida, 2008; Taylor & Katomeri, 2007).
- Improves mood (Robertson et al. 2012).
- Boosts mental health (Lautenschlager et al., 2008).
- Allowing people to focus on the distal, more abstract, big picture (Labroo & Patrick, 2009).

Physical activity and change

- When people move to a new country and experience change, they become better at solving creativity puzzles because they are geared toward dealing with new situations (Maddux & Galinsky 2009).
- Firming muscles can non-consciously cue thoughts about willpower (Hung & Labroo, 2011).
- “Stepping outside a box” can increase thoughts and desire to be more creative (Leung et al., 2012).
- Standing tall can increase feelings of power (Riskind & Gotay, 1982).
- Creativity increased only when walking freely, as opposed to in a fixed path (Leung et al., 2012).



- H1: Creativity will be enhanced by a positive or negative change, rather than only an increase, in physical activity (sitting to walking; standing to sitting).
- H2: Creativity benefits of motion and any spillover effects will diminish over time with the repetition of the same activity.
- H3: Merely anticipating an impending physical change can also boost creativity.

Experiment 1

- Undergraduate students ($N = 29$, $M_{\text{age}} = 20.4$ years; 52% male) were each compensated \$10 to complete a study allegedly testing the quality of recording devices.
- Experimental manipulation of being seated or walking while engaged in a creativity task.

- Reported their mood using the PANAS (Watson, Clark, & Tellegen, 1988)
- Participants were randomly assigned to a seated or walking condition in the experimental manipulation phase.
- Alternative Uses Task (Guilford, 1967; Tan & Qu, 2015)



- After completing the uses generation task, each participant reported mood again, feeling of accomplishment, energy level, and evaluated quality of the recording device, consistent with the cover story.

Phase I: 8 minutes
(during activity)

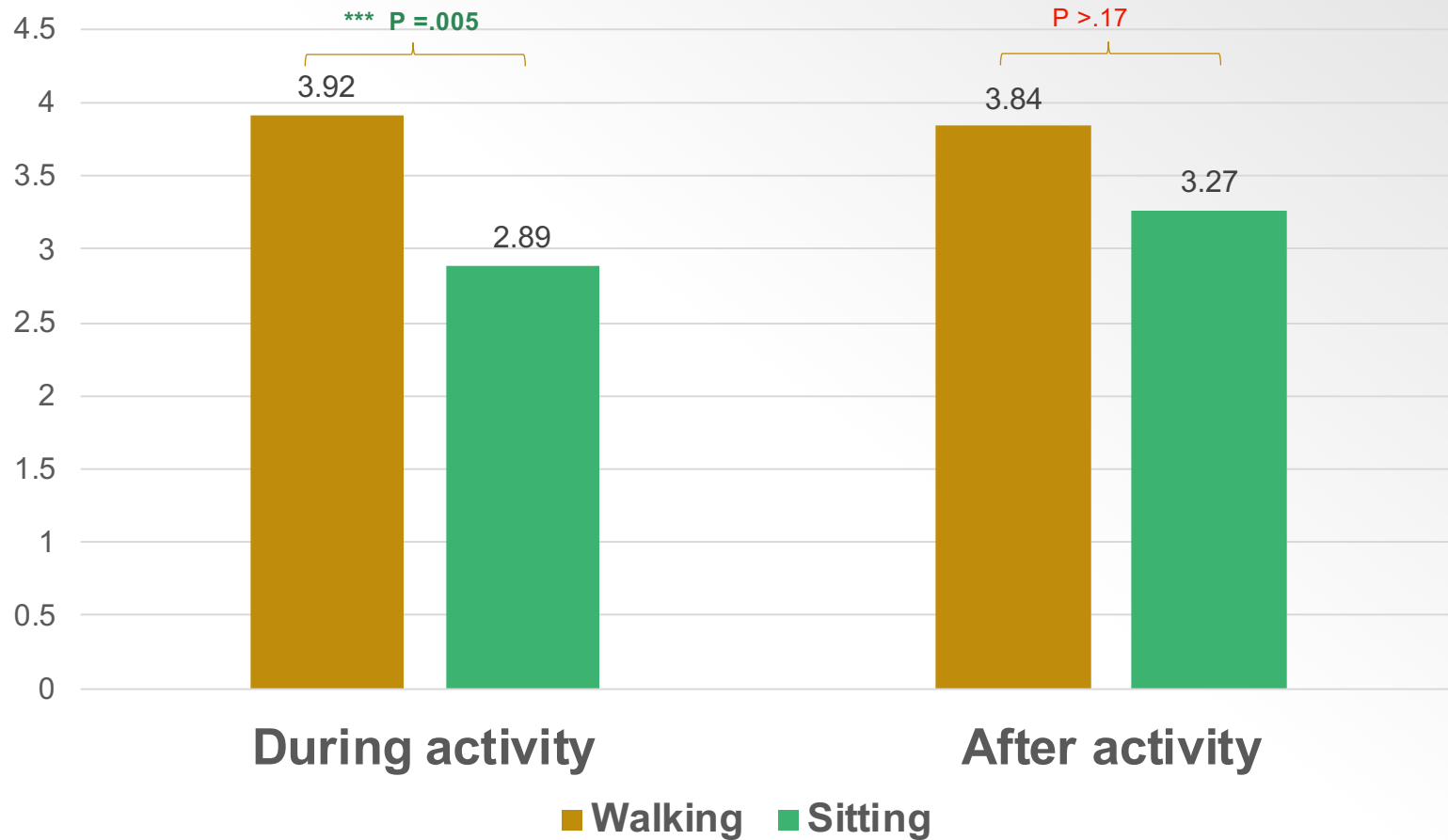


Phase II: 8 minutes
(after activity)



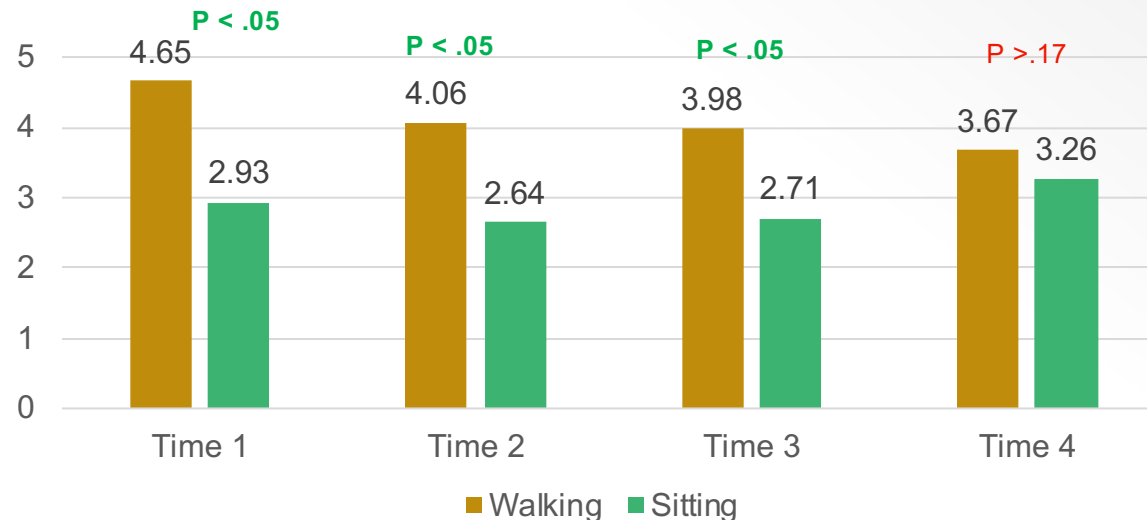
- Generated over 1000 unusual uses.
- 2 coders rated each unusual uses from 1 (not creative) to 10 (very creative).
- Krippendorff's $\alpha = .72$
- 2 (condition: sitting vs. walking) x 2 (idea generation: during vs. after) repeated-measures ANOVA with condition as a between-participants factor and timing as within-subjects factor revealed the predicted interaction ($F(1, 27) = 4.38, p = .046$).

Overall creativity



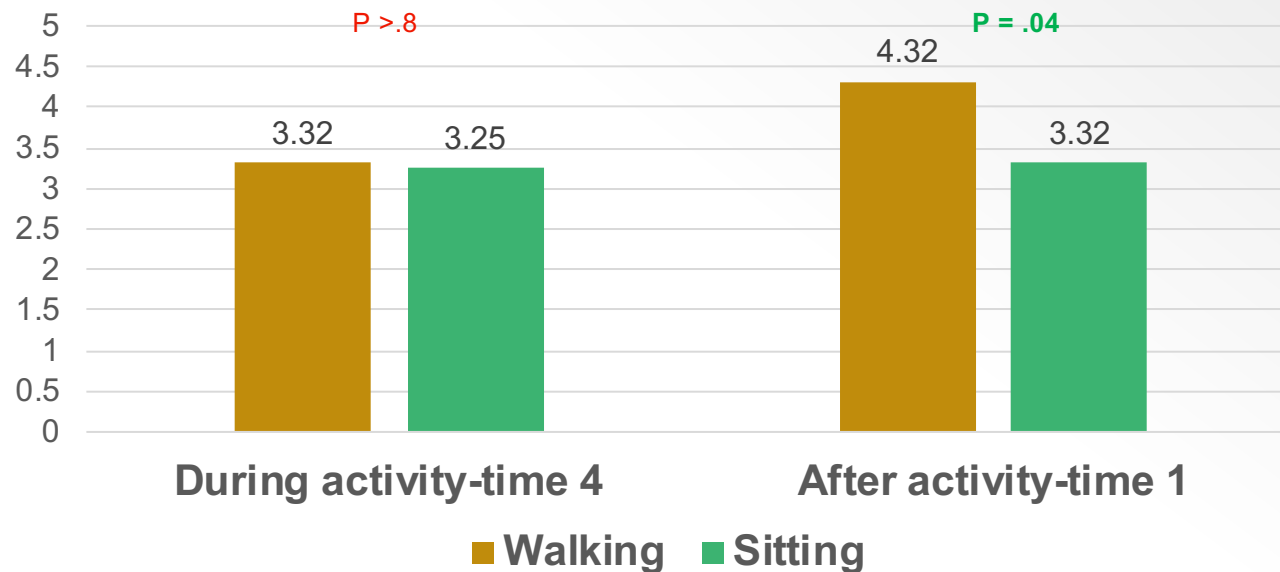
Creativity across each 2-min

- 2 (condition: sitting vs. walking) x 4 (during motion timing: 2 minutes, 4 minutes, 6 minutes, 8 minutes) mixed ANOVA with condition as a between-participants factor and timing as within-participants factor for the unusual uses generated in the during activity phase. The analysis revealed only a significant linear contrast interaction ($F(1, 26) = 4.76, p = .039$).



Change in activity

- Furthermore, to examine the transition from walking to sitting, we ran a 2 (idea generation: phase 1, time 4 vs. phase 2, time 1) x 2 (condition) mixed ANOVA which revealed a marginally significant main effect ($F(1, 26) = 3.55, p = .07$) and interaction ($F(1, 26) = 2.74, p = .1$).



Discussion

- Walking as compared to sitting increases creativity (H1).
- This difference dissipates over time, after approximately 6 minutes of walking (H2).
- Change in activity boosts creativity (H1).
- Visual stimuli!!!



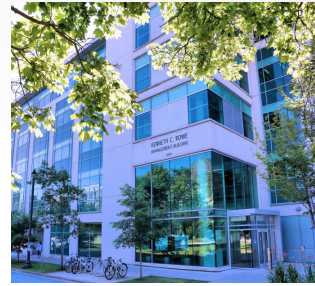
Experiment 2

- Fifty-six participants ($M_{\text{age}} = 23.5$ years; 52% male) were each compensated \$10 to complete a study allegedly testing the quality of recording devices.
- Experimental manipulation of being stand still, walking on treadmill, or walking while engaged in a creativity task.

Phase I: 8
minutes
(practice
activity)



Phase II: 8
minutes (during
activity)



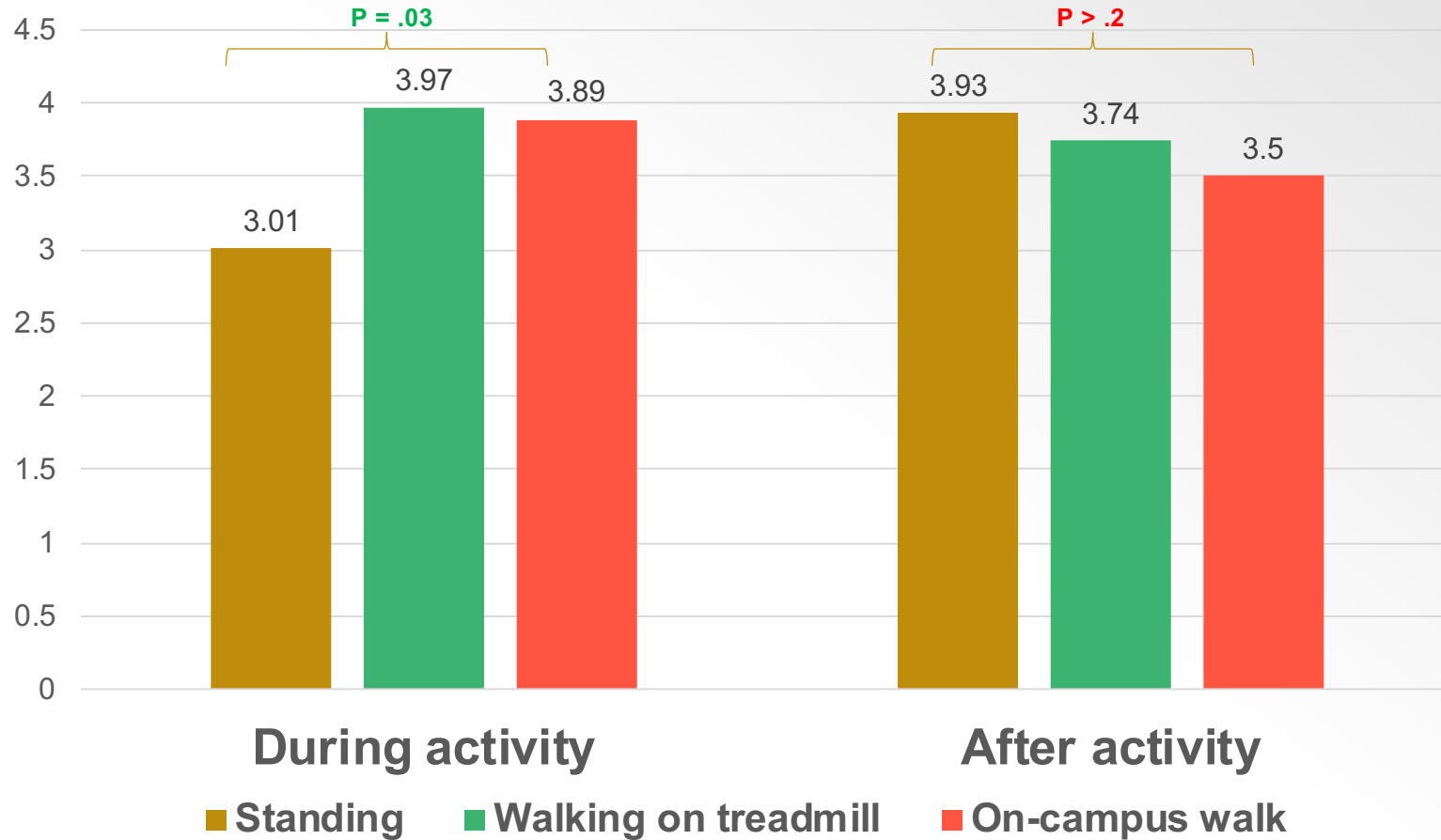
(following Berman, Jonides, & Kaplan, 2008)

Phase III: 8
minutes
(after activity)



- Generated over 1500 unusual uses.
- 2 coders rated each unusual uses from 1 (not creative) to 10 (very creative).
- Krippendorff's $\alpha = .68$
- 3 (condition: walk campus vs. walk treadmill vs. standstill observe movement) x 2 (idea generation: phase 2 vs. phase 3) repeated-measures ANOVA with condition as a between-subjects factor and timing as within-subjects factor revealed only the predicted interaction ($F(2, 53) = 4.59, p = .02$)

Overall creativity



Creativity across each 2-min- during activity

- A 2 (condition: walk vs. standstill observe movement) x 4 (during motion timing: 2 minutes, 4 minutes, 6 minutes, 8 minutes) repeated-measures ANOVA with condition as a between participants factor and timing as within-participants factor conducted.



Discussion

- Walking as compared to standing increases creativity (H1).
- This difference dissipates over time, after approximately 6 minutes of walking (H2).
- Change in activity boosts creativity (H1).
- Results is not due to the visual stimuli.

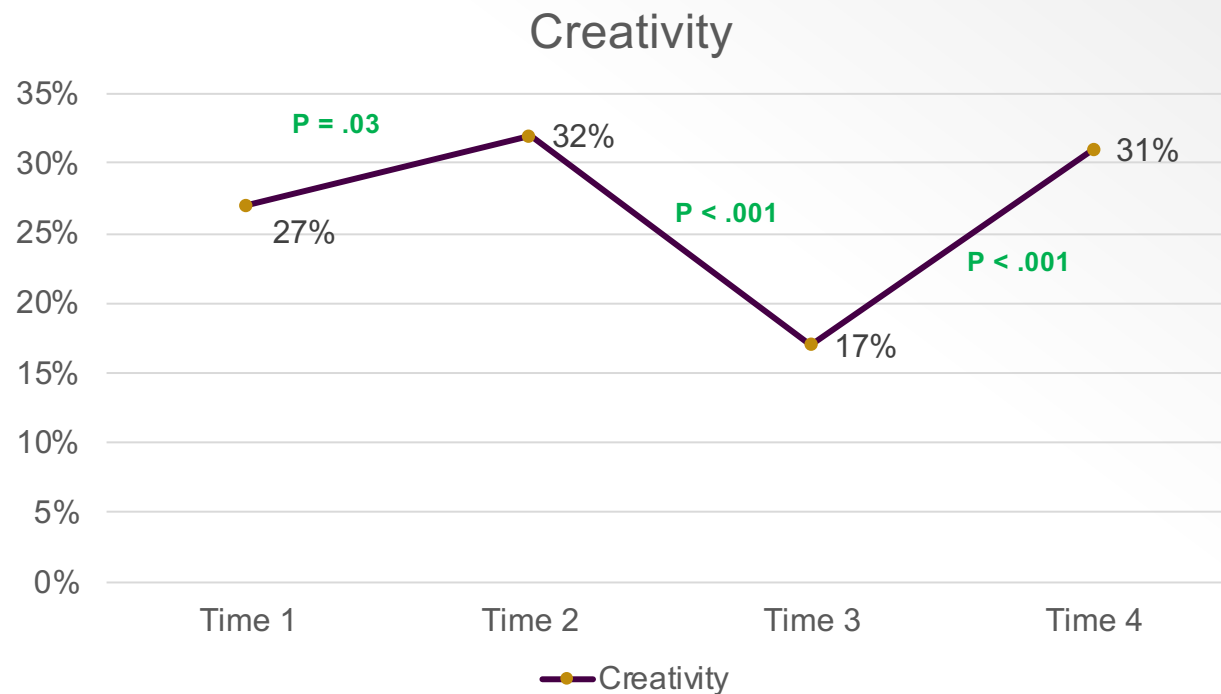
- What about anticipation of physical change?
- It would add robustness to utilize a different measure of creative thinking!!
- Sample size!!

Experiment 3

- Adults (N = 50, 58% male) were each compensated \$10 to complete a study allegedly testing the quality of recording devices.
- The experiment was a within-participants experiment with one movement condition (with four stages of 2-minute periods).
- Participants were told to walk on the treadmill for 8 minutes.
- Remote Association Test (RAT) (e.g.; cottage, swiss, cake, solution: cheese).
- Unlike S1 and S2, participants were told about 4 stages and the background has been changed for every 2 minutes, so they could understand that they are approaching the end of experiment.
- DV: Proportion of correct answers.

Results

- A repeated-measures ANOVA with time as a within-participants factor shows a significant difference in creativity across the four phases ($\eta_{Hyunh-Feldt} = .88$, $F(2.65, 122.87) = 15.21$, $p < .001$).



Discussion

- Replicate the prior findings, and show a larger effect size using a different creativity task and an increased sample size.
- Using non-student sample.
- Anticipation of change boosts creativity (H3).

- The benefits of physical activity begin to arise when a person engages in physical activity, yet the beneficial effects of motion are limited.
- A change from one activity to another results in another boost in creativity that again fades over time.
- Merely viewing physical activity does not result in similar benefits to creativity.

