



Nudges for a New context

- Context: A multinational textile manufacturer in China
- Problem: Workers were unresponsive to the factory's rules and monetary incentives to throw waste in trash cans, rather than on the floors.
- Motivation to address: To work without pause under a piece-rate wage system
- Countervailing motivation: To keep the floors uncontaminated by waste
- Nudge proposed: Golden coin decals
- Cognitive mechanism:
 - The shared belief that golden coins are an omen for fortune and luck
 - A repellant; change idea of the floor as a waste-space to a space where waste was inappropriate

Experimental Design

- Six production departments of a textile factory in Suzhou, China.
- Using a stepped wedge repeated within-group design, we randomized which days the coin nudge was implemented, removed, and re-implemented in each department over a period of 5 months.
- Collected and coded daily pictures ($N = 7,927$) to tracks waste on the floors before, during, and after coin nudges.
- RAs rated waste amount (1 = no waste on floor to 5 = a lot of waste on floor).



Fig 1. Two photographs of the nudge implementation.

Randomization Schedule

Department	Baseline	First nudge implementation	Removal of nudge	First nudge duration	Second nudge implementation	Measurement completion	Second nudge duration
Department 1	Aug 5	Sep 7	Oct 12	5 weeks	Dec 7	Dec 25	3 weeks
Department 2	Aug 5	Aug 31	Nov 9	10 weeks	Dec 7	Dec 25	3 weeks
Department 3	Aug 5	Oct 5	Oct 26	3 weeks	Dec 7	Dec 25	3 weeks
Department 4	Aug 5	Sep 14	Nov 16	9 weeks	Dec 7	Dec 25	3 weeks
Department 5	Aug 5	Sep 28	Oct 19	3 weeks	Dec 7	Dec 25	3 weeks
Department 6	Aug 5	Sep 21	Nov 2	6 weeks	Dec 7	Dec 25	3 weeks

Results

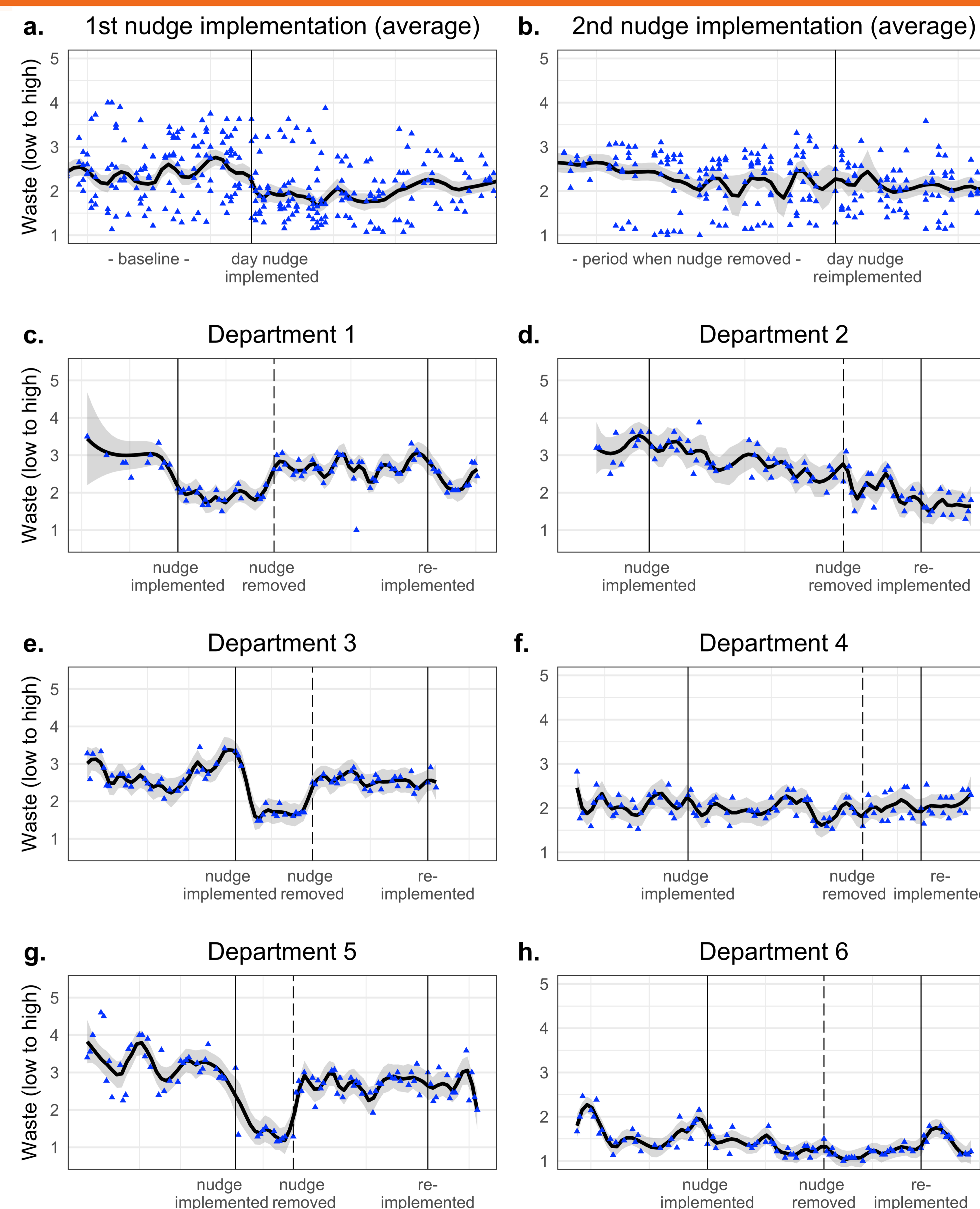


Fig 2. Amount of waste (y-axis) as a function of days (x-axis) during the total experimental period in each experimental department. Panels a and b depict average time trends in all six departments before and after the first and second coin nudge implementations, as a function of a standardized intervention start day. Panels c to h illustrate individual departments' daily waste amount across time. Each data point represents the average amount of waste for all the pictures taken on a single day in a department. Error bars represents 95% confidence intervals. Y-axis represents the amount of waste on the production floors on a 5-point scale as coded by independent judges (1 = no waste on floor to 5 = a lot of waste on floor).

Results

- The coin nudge was effective in repelling waste behavior when it was initially implemented on the production floors ($M=2.48$, $SD=1.23$; $M=1.95$, $SD=1.01$), reducing waste by an average of 20%; $\beta=-0.31$, $CI=[-0.43, -0.19]$, $p<.001$.
- The average treatment effect of the first coin nudge did not decay over time when it was implemented.
- Waste bounced back after removal of the first nudge, not distinguishable from the baseline; $M=2.35$, $SD=1.17$; $\beta=-0.19$, $CI=[-0.55, 0.18]$, $p=0.32$.
- The second coin nudge had average null effect on changing behavior, possibly due to workers' changed construal of the decals; $M=2.17$, $SD=1.13$; $\beta=-0.01$, $CI=[-0.09, 0.12]$, $p=.80$

Discussion

- Nudges work when they are aligned with people's motivation and are designed with the context in mind.
 - The images of golden coins created a strong countervailing motivation—to respect a symbol of cultural and religious meaning by not defacing it with waste.
- Results underline the importance of construal, or subjective interpretation, in the success of nudges and choice architecture.
 - Coin nudge used to be a repellant, but ceased to be when the re-implementation changed its meaning.
- Individuals' response to a nudge is not static, but a dynamic process influenced by their motivation supporting the behavior and their perception of the nudge intervention.
- In addition to thinking about the cognitive principles that have given rise to many successful nudges, we'd think about the motivational forces behind behavioral patterns.

Acknowledgement

We thank Paige Amormino, Rachel Lim, Aneesh Rai, Calvin Yu for research assistance. We thank the Canadian Institute for Advanced Research and Fund for Experimental Social Sciences from Princeton University for funding.

Contact: Sherry Jueyu Wu (jueyuw@princeton.edu)