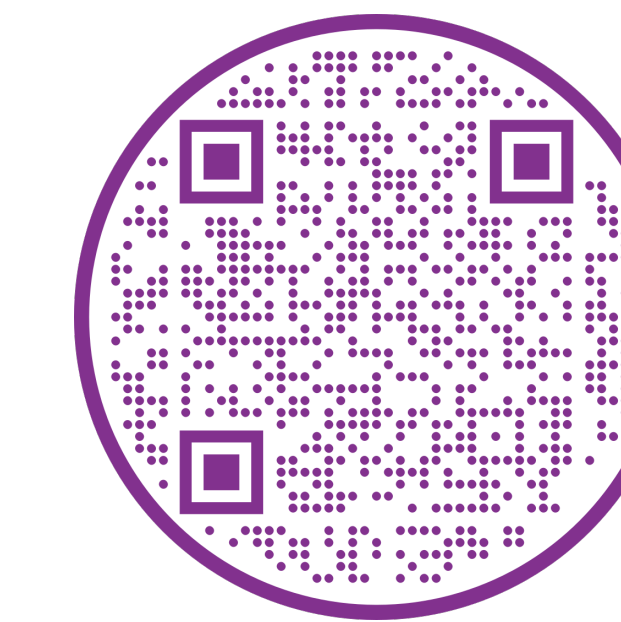# The Impact of Peer Recognition on Content Sharing Social Network Platforms

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## Motivation

- Social network platforms that feature user-generated content (UGC) need **low-cost ways to motivate content providers**
- Scant field research has causally examined the effect of **peer recognition on recipients' motivation**
- **Diffusion of peer recognition** on a social network is critical for quantifying and maximizing the value of peer recognition

## Research Questions

- **Production effect**: Does receiving peer recognition **booster content production**?
- **Diffusion effect**: Does receiving peer recognition lead content providers to **give more recognitions**? If so, peer recognition can also have **cascading effect** on production via diffusion
- **Global effect**: How to quantify the overall effect of peer recognition **on the entire social network**?

## Main Findings

- **Field experiments (N=1,671,766):** receiving peer recognition boosts users' content production (**production effect**) and increases users' likelihood of giving recognition to others (**diffusion effect**), especially for stronger ties
- **Social network model + experimental data + simulation**: accounting for diffusion of peer recognition is critical for estimating and optimizing the **global effect** of peer recognition

## The Field Experiments

We conducted the main and replication field experiments (total N = 1,671,766) on a **video-sharing social network platform** (similar to TikTok). Users on the platform are peers, act as content providers and/or viewers, and can "follow" each other.

We designed "**peer nudges**" as a subtle form of **peer recognition** that followers can give to content providers.

A provider's profile page from the viewer's perspective

The icons read: "poke this provider"
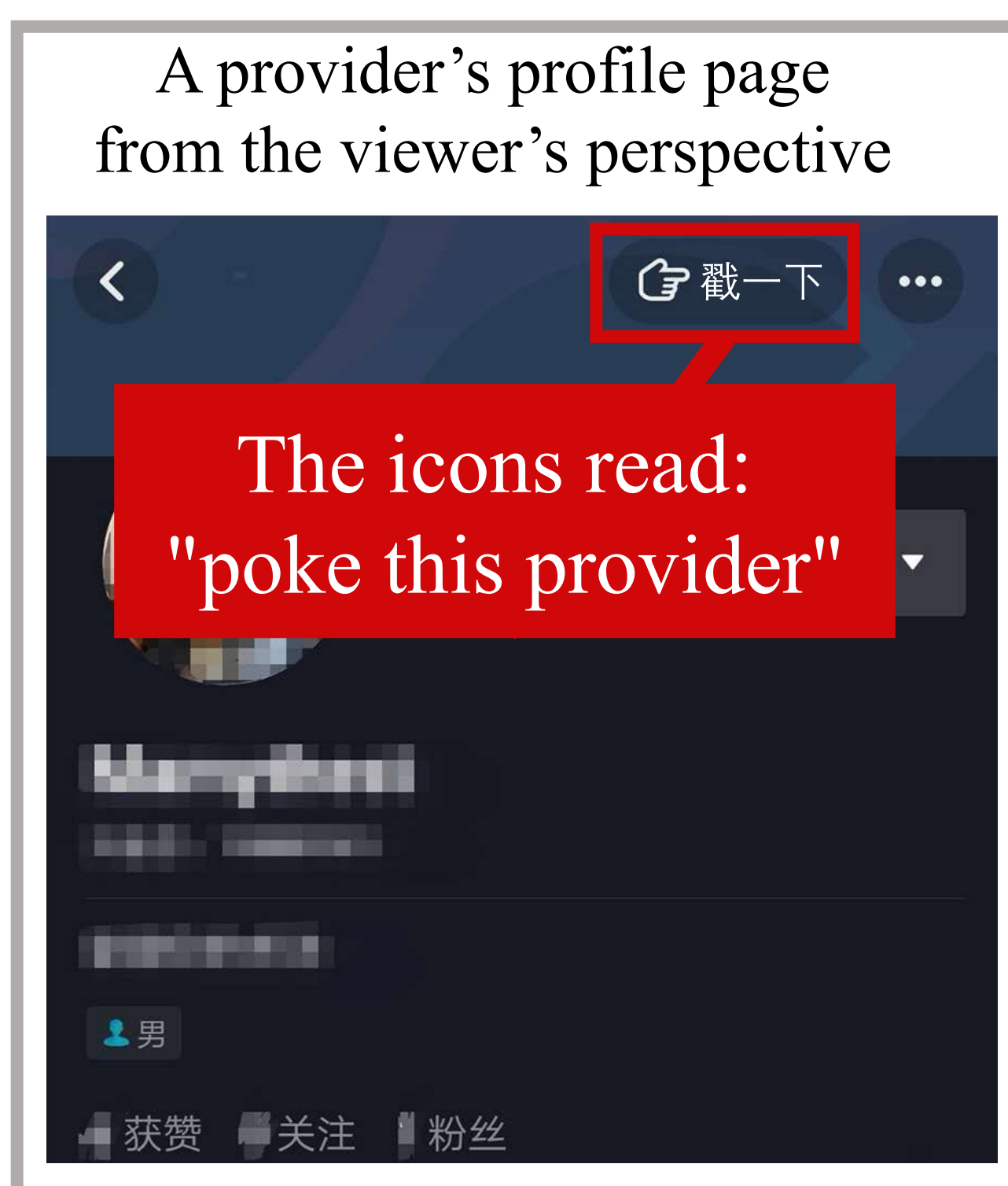
We put an icon 👉截一下 on each provider's profile page

✉ By clicking on this icon, followers sent **"peer nudges"** to content providers

Providers were randomized

| **Treatment** providers **could see the peer nudges** sent to them | **Control** providers **could NOT** (i.e., unaware of nudges) |
|---|---|

Treatment providers' message page

消息
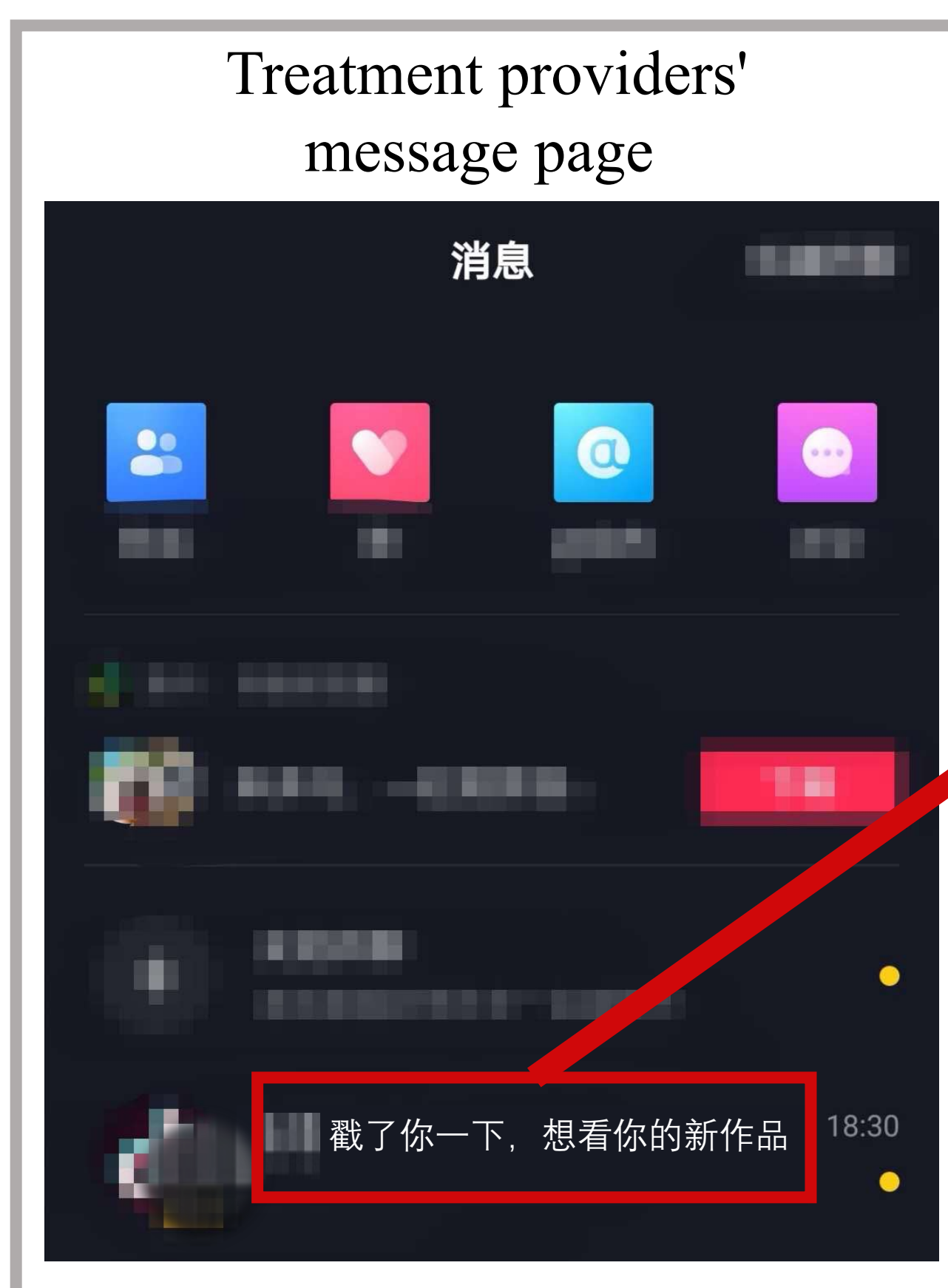
**Peer nudges read: "[nudge sender name] poked you and wanted to see your new posts"**

截了你一下，想看你的新作品  18:30

**Peer nudges** convey that nudge senders value the providers' existing work and are interested in their future work

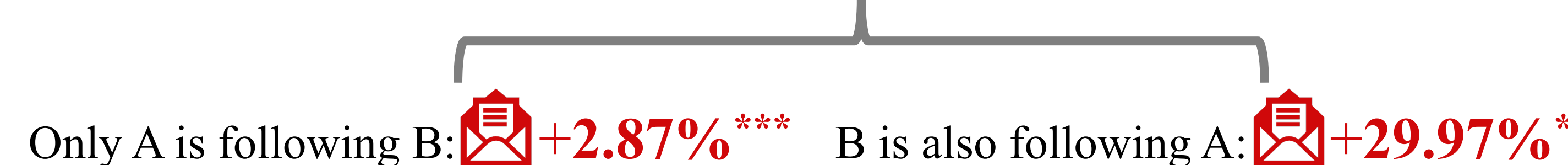## Production Effect

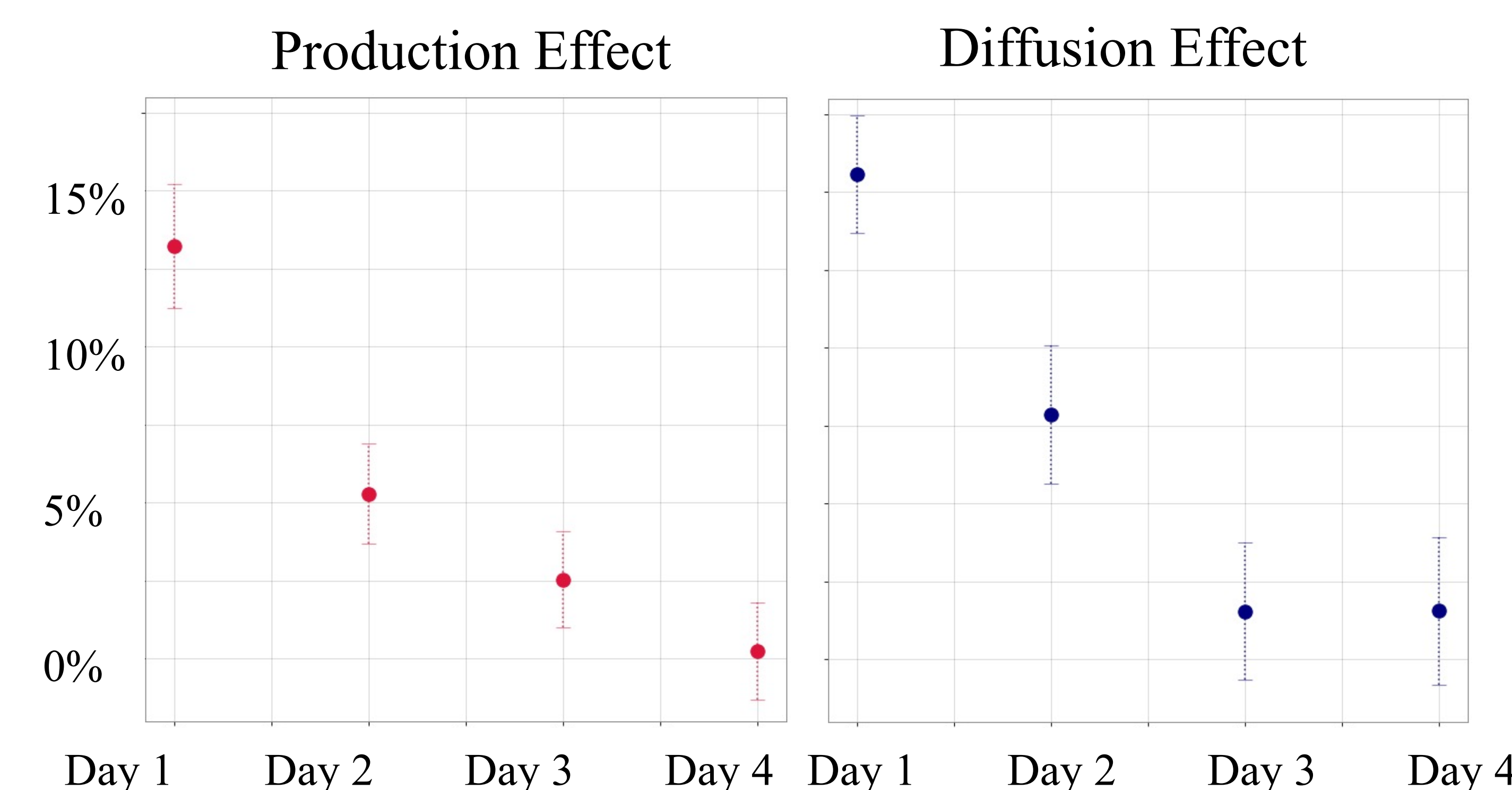Receiving one peer nudge immediately boosted video production by **13.21%***. Stronger ties have a bigger effect.

Only A is following B **+9.37%***

B also is following A **+17.39%***

A sends B a peer nudge
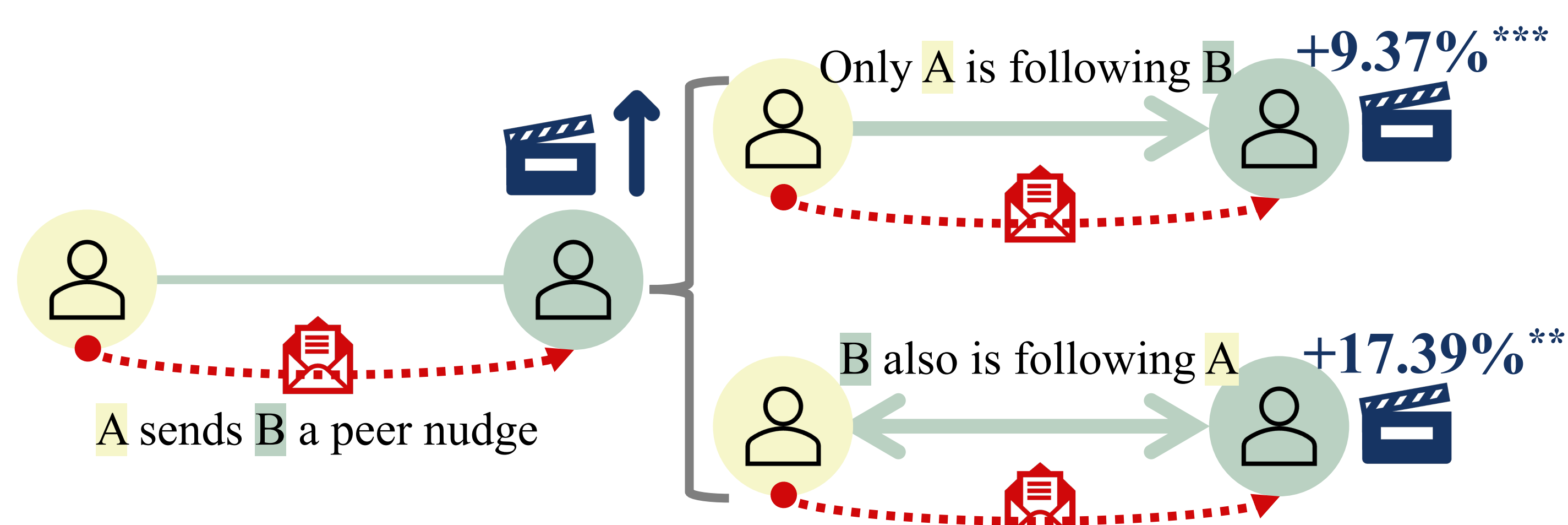
## Diffusion Effect

Receiving one peer nudge immediately increased nudges sent out by **15.57%***. Stronger ties have a bigger effect.

Only A is following B: **+2.87%***   B is also following A: **+29.97%***

## Effects Over Time

Production Effect

Diffusion Effect

Day 1  Day 2  Day 3  Day 4   Day 1  Day 2  Day 3  Day 4

15%  10%  5%  0%

## Global Effect & Social Network Model

$$n_e(t) = \mu_e + \sum_{s=1}^{t} \alpha_d^{t-s} \sum_{l \in E:\, l_d = e_o} d_{le}\, y_l(s) + \varepsilon_e^y(t), \forall e \in E$$

**Number of nudges on edge $e$ in period $t$** = baseline number of nudges on edge $e$ + boost of nudges due to diffusion from period 1 to period $t$ + random noise

$$v_i(t) = \sum_{s=1}^{t} \alpha_p^{t-s} \sum_{e \in E:\, e_d = i} p_e\, n_e(s), \forall i \in V$$

**Boost of videos on node $i$ in period $t$** = Sum of (**number of nudges of on edge $e$ in period $s$** * production effect in period $s$) from period 1 to period $t$

Deriving the equilibrium: $n_e^*, v_i^*$

Approximating $n_e^*, v_i^*$ via a feasible numerical way

**Causally estimating** $\mu_e, d_{le}, p_e, \alpha_d, \alpha_p$ using the **experimental data**

Calculating the global effect

**Ignoring the diffusion effect** of peer nudges **underestimates** their overall production boost by **22%**

Our social network model can be used to **seed and target** peer nudges to maximize their global effect

Motivate A to send B a nudge
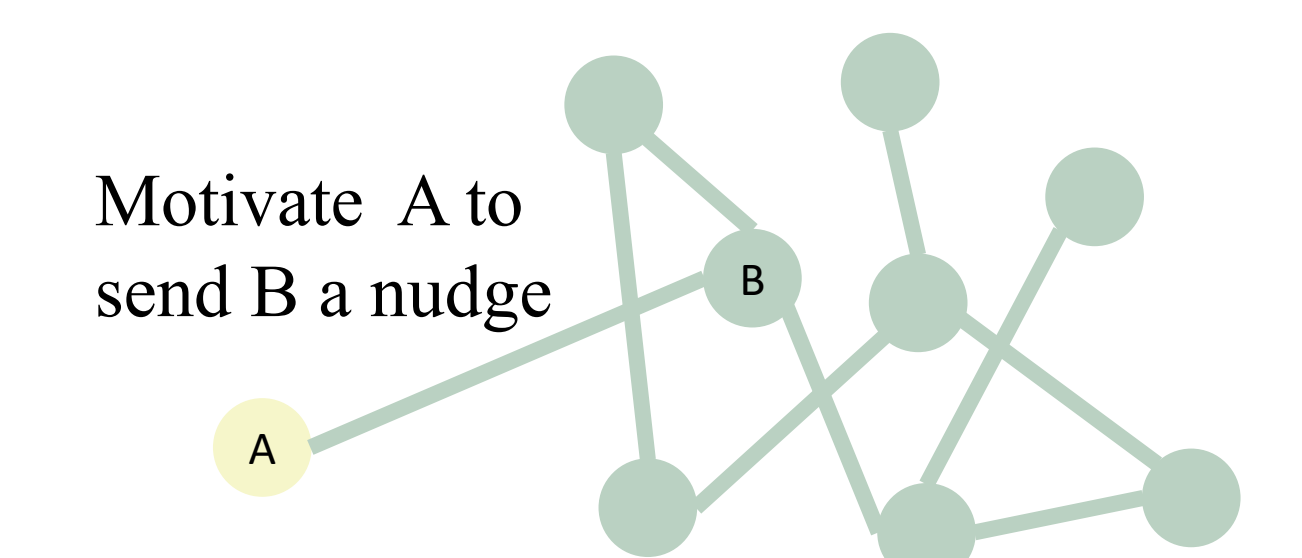
## Insights

- Peer nudges can be a low-cost lever to boost UGC production
- Peer nudges can have cascading effects on production
- Overlooking the diffusion effect of peer nudges leads to underestimation of their global effect
- Our work has broad implications for estimating & optimizing the global effect of peer-based interventions on social network

Note: ***: p-value<0.001; *: p-value<0.05