

Effect of Anipang Adoption on Kakao Usage Times

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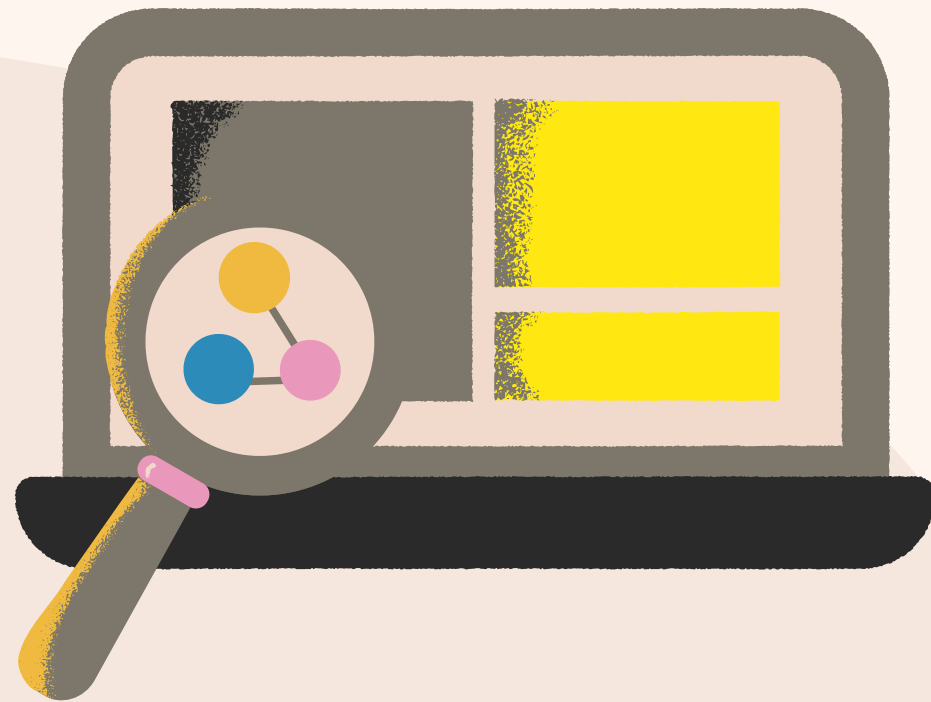
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Business Problem

Provide effective strategies for mobile app platform owners and app developers after a popular app has been released on a platform.



Data

Individual-level weekly panel data of app usage time spent on Android-based mobile devices.

Focal Mobile Platform

kakao

Focal Popular App



of Users in the Sample

N = 849

Timeframe: 2 weeks

July 23 - August 5, 2012

Demographic Profiles

Age, Gender, Education, &
Monthly Income

Variables

Variable	Description	Variable	Description
ii	1: If a user adopted Anipang at or before the current week; 0: Otherwise	t_anipang	Usage time of Anipang (in seconds)
t_kakao	Usage time of Kakao Platform (in seconds) = t_kakao_talk + t_kakao_story + t_kakao_game	t_non_kakao_talk	Usage time of communication apps outside Kakao platform (in seconds)
t_kakao_talk	Usage time of Kakao Talk (in seconds)	t_non_kakao_story	Usage time of social networking apps outside Kakao platform (in seconds)
t_kakao_story	Usage time of Kakao Story (in seconds)	t_non_kakao_game	Usage time of game apps outside Kakao platform (in seconds)
t_kakao_game	Usage time of Kakao Game (excluding Anipang) (in seconds)	t_non_kakao	Usage time of all apps outside Kakao platform (in seconds)

Research Questions

RQ1

How has Anipang's adoption affected the usage time of the **overall Kakao Platform**?

RQ2

How has Anipang's adoption affected **Kakao Talk's** app usage time?

RQ3

How has Anipang's adoption affected **Kakao Story's** app usage time?

RQ4

How has Anipang's adoption affected **Kakao Game's** app usage time?

RQ1

How has Anipang's adoption affected the usage time of the overall Kakao Platform?

Dependent Variables

- t_kakao

Independent Variables

- ii

Control Variables

- panel_id
- week
- t_kakao_talk
- t_non_kakao_talk
- t_non_kakao_story
- t_non_kakao_game
- t_non_kakao

RQ2

How has Anipang's adoption affected **Kakao Talk's** app usage time?

Dependent Variables

- t_kakao_talk

Independent Variables

- ii

Control Variables

- panel_id
- week
- t_kakao_story
- t_kakao_game
- t_non_kakao_talk
- t_non_kakao_story
- t_non_kakao_game
- t_non_kakao

RQ3

How has Anipang's adoption affected **Kakao Story's** app usage time?

Dependent Variables

- t_kakao_story

Independent Variables

- ii

Control Variables

- panel_id
- week
- t_kakao_talk
- t_kakao_game
- t_non_kakao_talk
- t_non_kakao_story
- t_non_kakao_game
- t_non_kakao

RQ4

How has Anipang's adoption affected Kakao Game's app usage time?

Dependent Variables

- t_kakao_game

Independent Variables

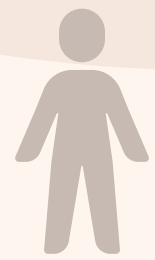
- ii

Control Variables

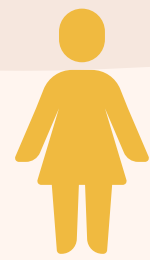
- panel_id
- week
- t_kakao_talk
- t_kakao_story
- t_non_kakao_talk
- t_non_kakao_story
- t_non_kakao_game
- t_non_kakao

Descriptive Statistics

Demographics



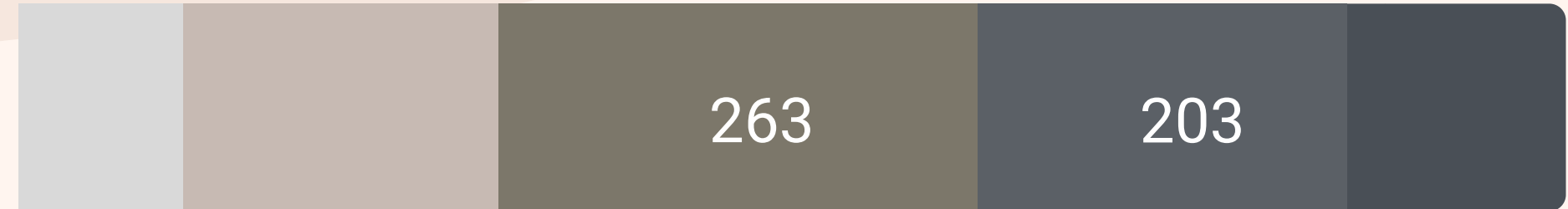
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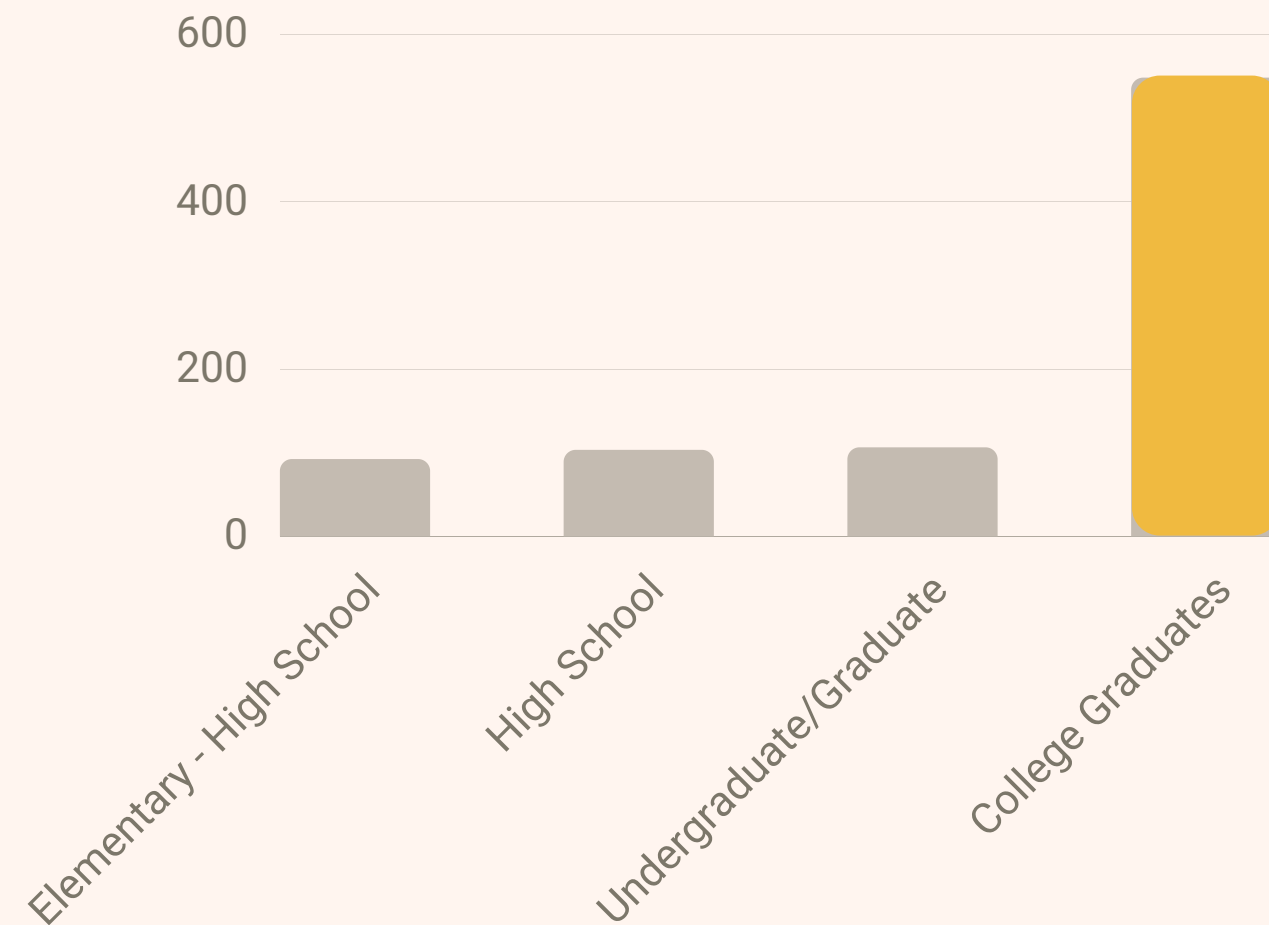
381

Age:

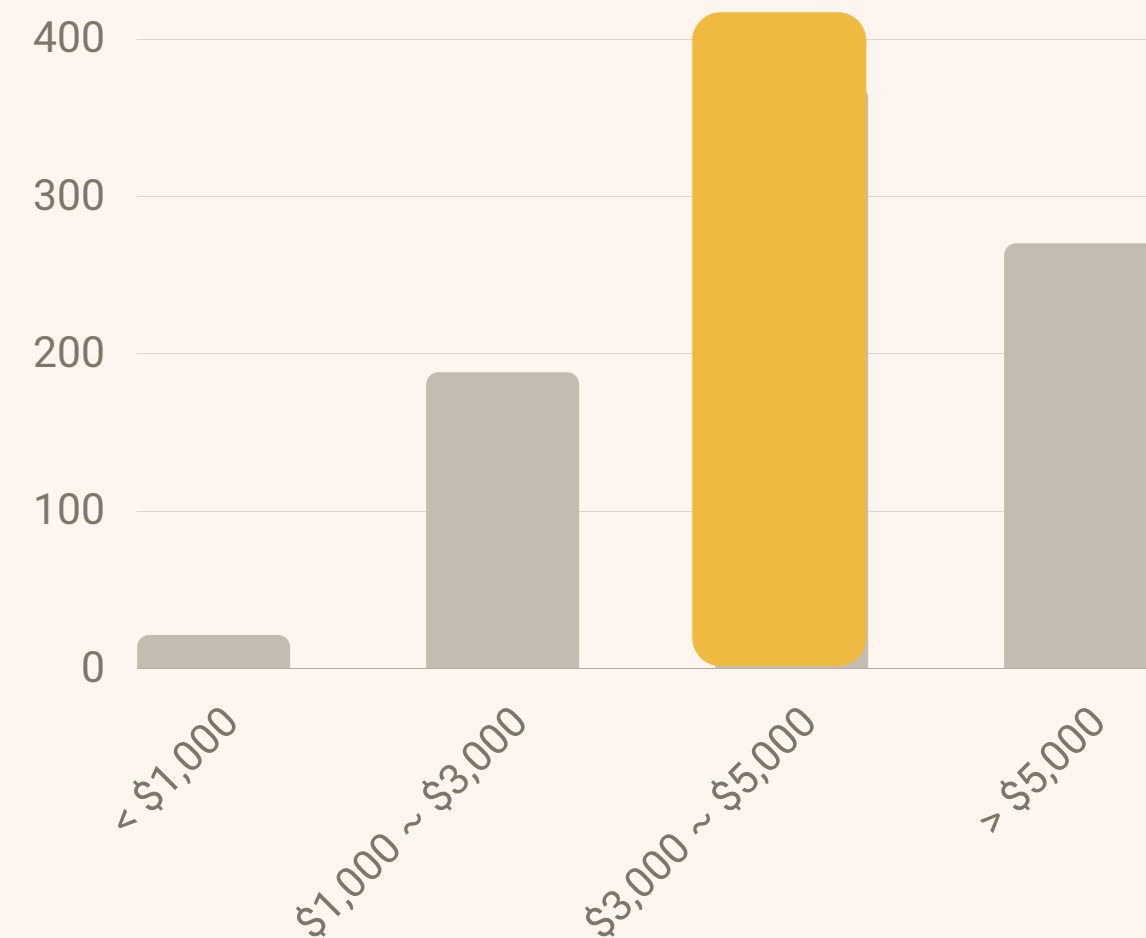
7 ~ 18 19 ~ 29 30 ~ 39 40 ~ 49 50 ~ 69



Education



Income

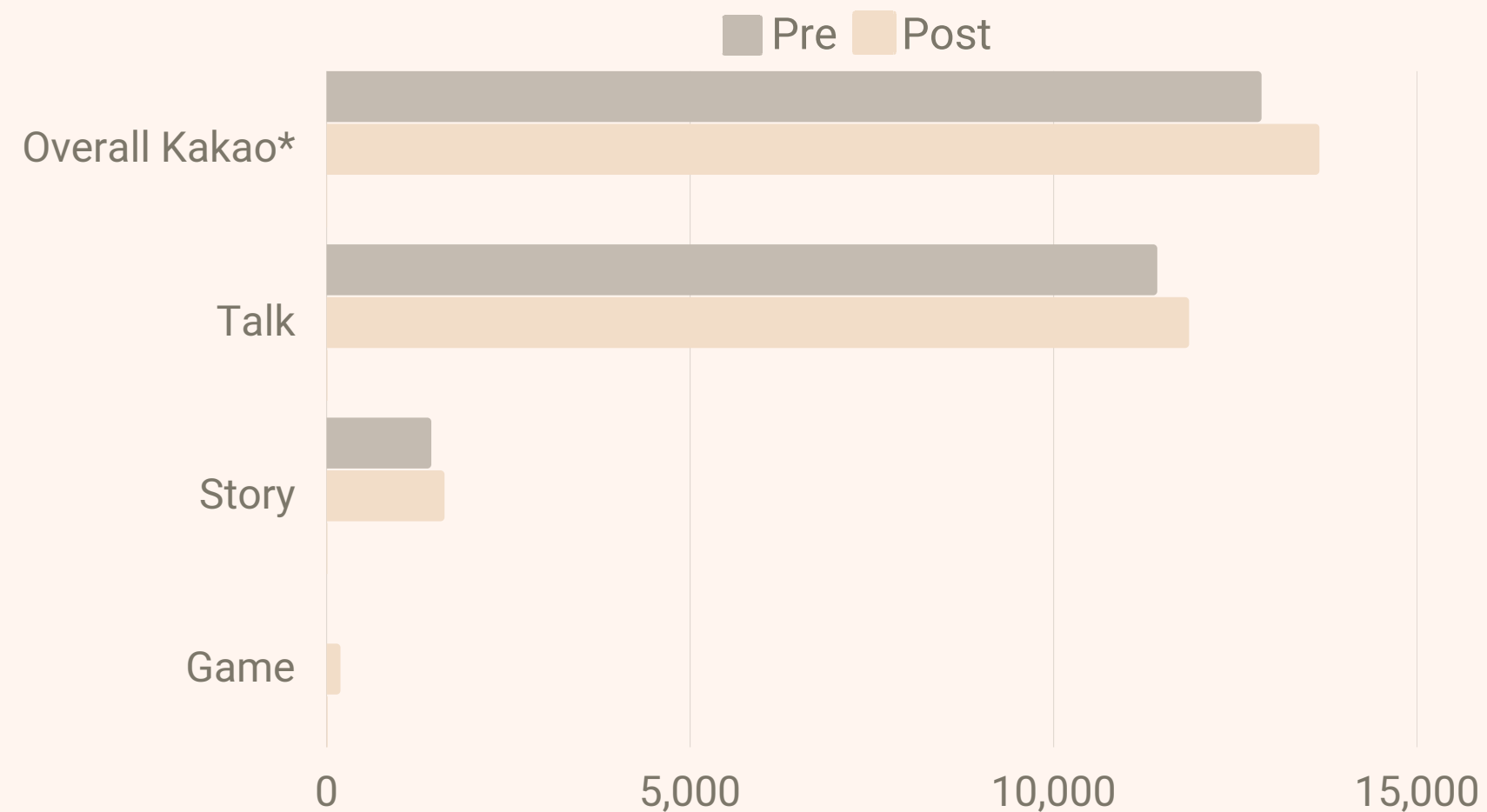


Descriptive Statistics

User Behavior

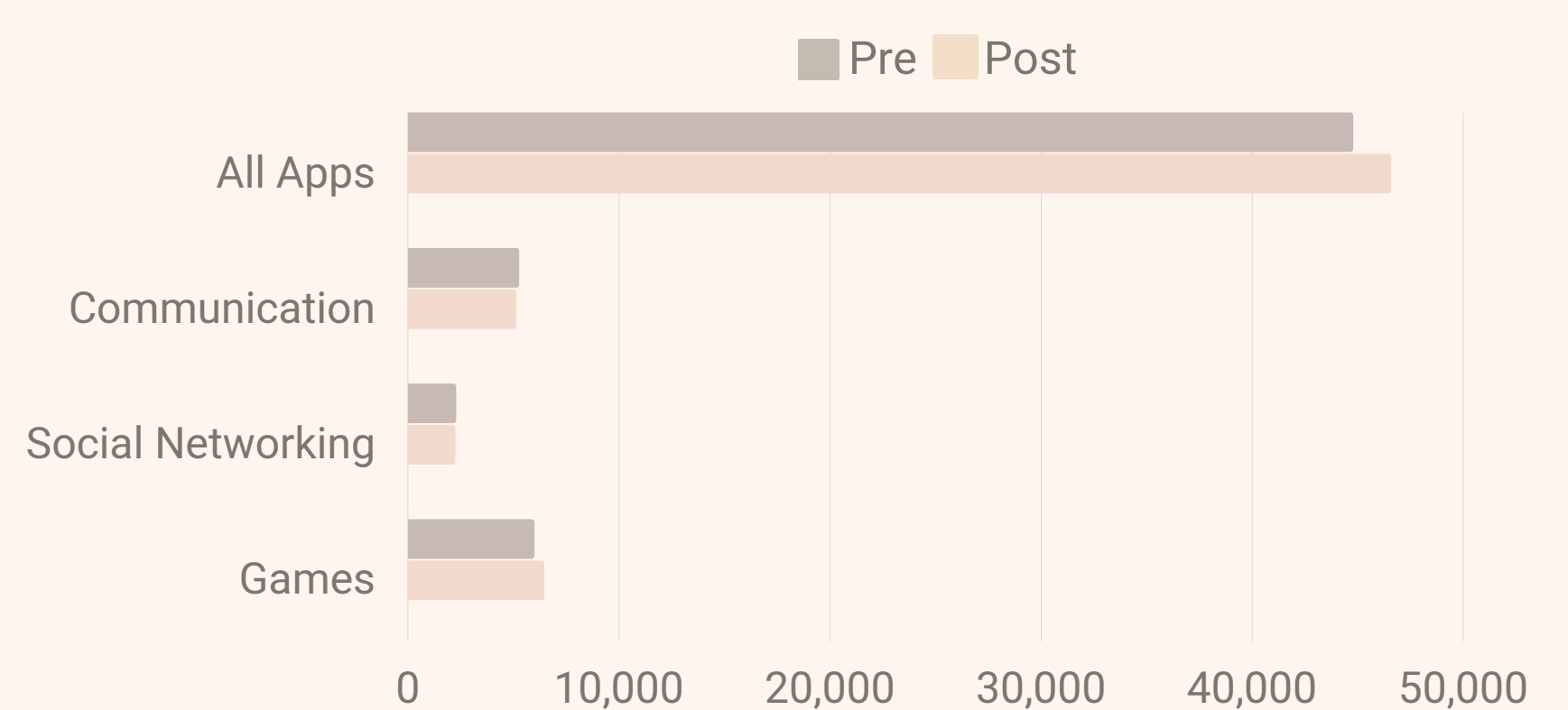
Average Usage Time on Kakao Platform

12,852.93 sec



Average Usage Time outside Kakao Platform

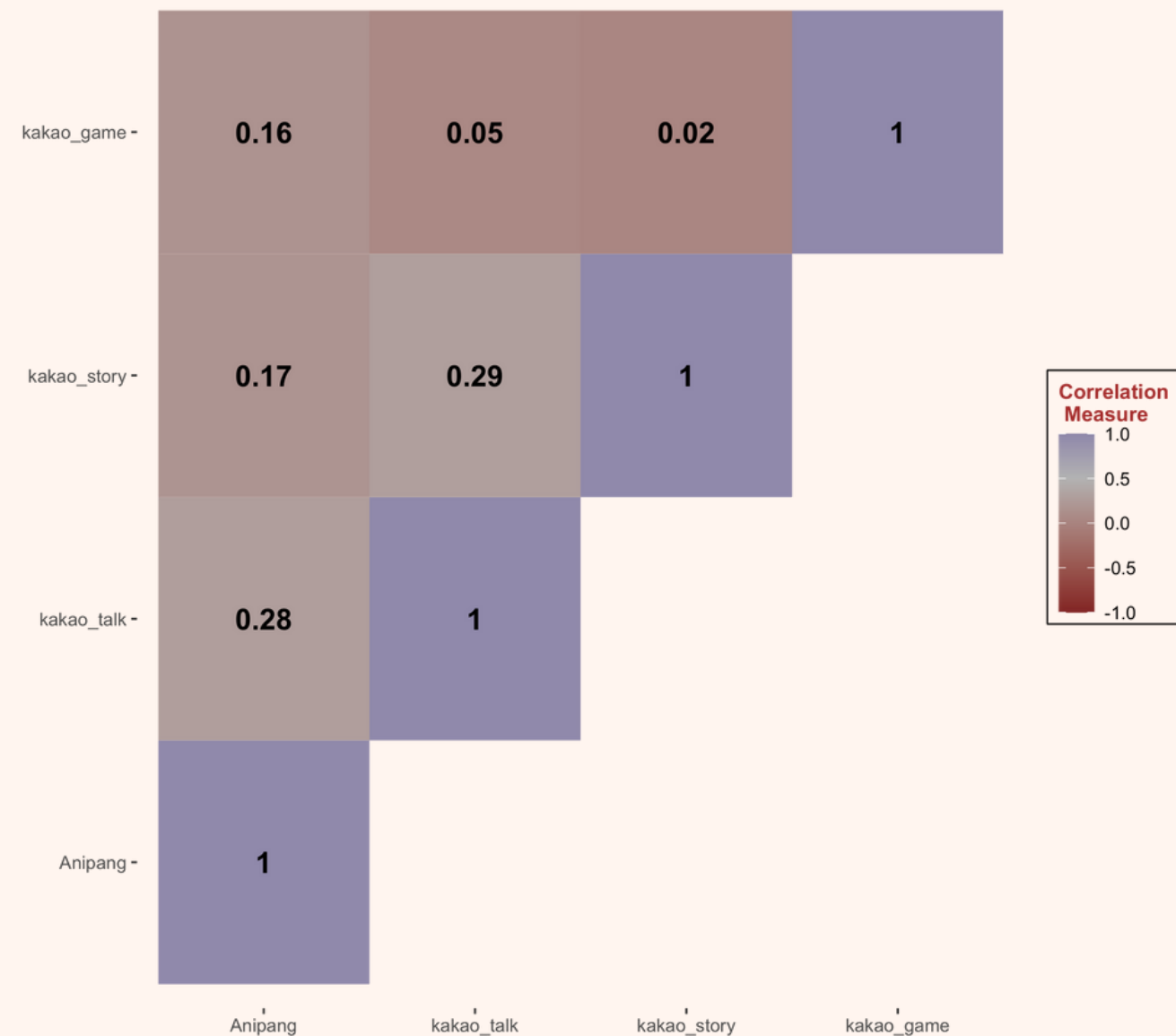
5,242.411 sec



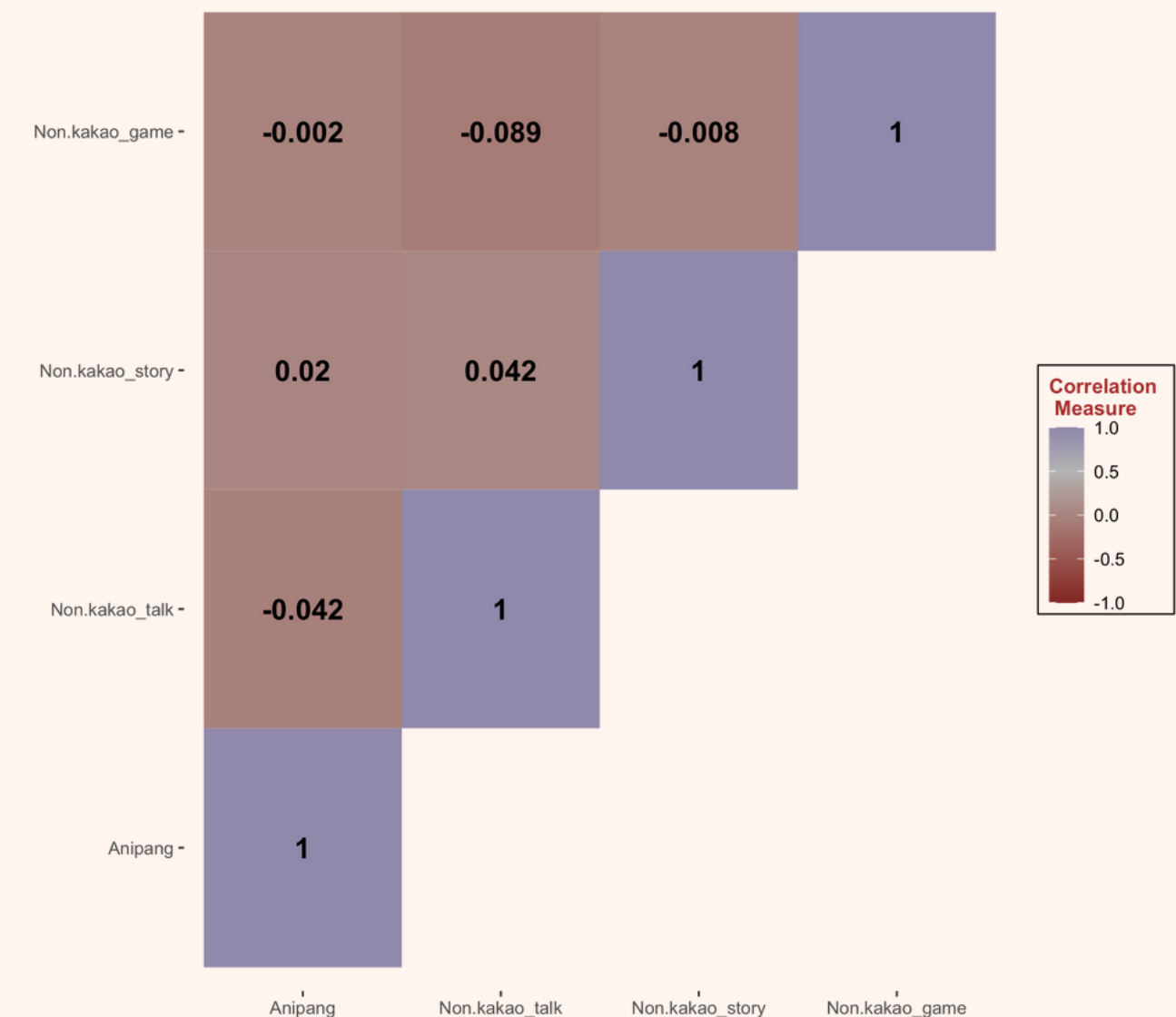
Descriptive Statistics

Correlation

Correlation between App Usage Time Kakao platform of Anipang Adopter



Correlation between App Usage Time outside Kakao platform of Anipang Adopter



Matched Samples

We used PSM to reduce selection bias and increase the causality of treatment effect. We evaluated the quality of our 10 matched samples by comparing the distributions of propensity scores between treatment group and control group, between raw and matched samples.

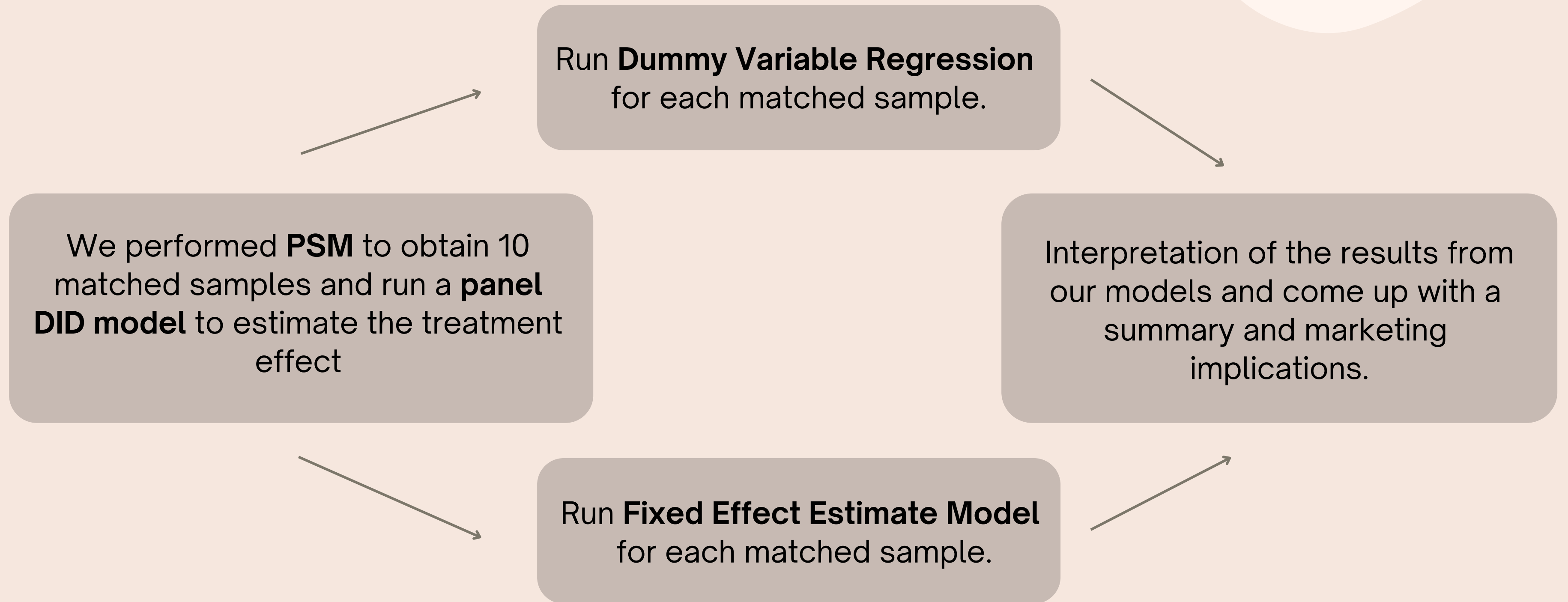
Matching Variables

Observations collected during the time period before Anipang's release

- Week - 1: before the release of Anipang (July 23 ~ July 29, 2012)

Time Varying Variables	Time Invariant Variables
t_non_kakao	Age
t_kakao_talk	Gender
t_kakao_story	Education

Models



Results

*** Significant at 0.01%, ** Significant at 1% , *Significant at 5%

Research Question - 1			Research Question - 2		Research Question - 3		Research Question - 4	
Matched Sample (Ratio, Replacement, Caliper)	Dummy Variable Regression	Fixed Effects Estimation	Dummy Variable Regression	Fixed Effects Estimation	Dummy Variable Regression	Fixed Effects Estimation	Dummy Variable Regression	Fixed Effects Estimation
1 (1:1, Without, 0.05)	3535.03*	3535.03*	1155.95	1155.95	1010.29	1010.29	2092.60	2092.60
2 (1:1, Without, 0.1)	1929.11	1929.11	3625.80	3625.80	-224.32	-224.32	1973.50*	1973.50*
3 (1:1, Without, 0.2)	1847.73	1847.73	4041.67	4041.67	-194.93	194.93	1874.95*	1874.95*
4 (1:1, With, 0.05)	3139.60*	N/A	-344.72	N/A	1123.04	N/A	1583.14	N/A
5 (1:1, With, 0.1)	3021.00*	N/A	-127.0	N/A	1053	N/A	1547	N/A
6 (1:1, With, 0.2)	2875*	N/A	736.18	N/A	900.8	N/A	1579	N/A
7 (2:1, Without, 0.05)	3785***	3784.65***	2112	2112.17	1308	1307.9	2126**	2126.42**
8 (2:1, Without, 0.1)	2533*	2532.8*	4024	4024.18	434	433.99	1896**	1895.94**
9 (2:1, Without, 0.2)	2224*	2224.2*	4812	4811.9	255	255	1789**	1788.85**
10 (2:1, With, 0.05)	2692*	N/A	2556	N/A	651	N/A	1728*	1728.05*

Summary of Results

For the interpretation of our results we are assuming that our matched samples are correct. Both models have consistent results confirming the **robustness** of our findings.

Research Question 1 - Overall Kakao Platform

- 8/10 of our matched samples show that Anipang Adopters have a **significant** effect on the usage of the overall Kakao Platform.
- For example, for Anipang Adopters the usage of the overall Kakao Platform increases by **3,535.03** seconds more than non-Adopters (Matched Sample 1)

Research Question 2 - Kakao Talk

- **None** of our matched samples show that Anipang Adopters have a significant effect on the usage of Kakao Talk.

Research Question 3 - Kakao Story

- **None** of our matched samples show that Anipang Adopters have a significant effect on the usage of Kakao Story.

Research Question 4 - Kakao Game

- 6/10 of our matched samples show that Anipang Adopters have a significant effect on the usage of Kakao Game.
- For example, for Anipang Adopters the usage of Kakao Game increases by **2,126** seconds more than non-Adopters. (Matched Sample 7)

Marketing Implications

1

Since the adoption of a popular game app doesn't seem to have a significant effect on the usage of Kakao's communication or social networking apps



Mobile app developers shouldn't invest in developing games as a way to increase usage and/or engagement on other applications within the ecosystem.

2

Since the adoption of a popular game app does seem to have a significant effect on the usage of the overall ecosystem



If mobile platform developers want to continue to increase the overall ecosystem usage time and engagement of users (loyalty), they should invest in developing additional games for consumers to spend their time in.

3

Since the adoption of a popular game app does seem to have a significant effect on the usage of other Kakao gaming apps



Game developers could potentially invest in developing additional games that complement an existing game ecosystem to increase its usage and engagement.

Limitations

- **Practical Limitations:** including all possible matching variables to increase power of predicted propensity score
- **Low External Validity:**
 - Research only focuses on one mobile platform and one app
 - Only included Android-based mobile devices
 - The data time frame only spans for two weeks back in 2012
- We can't rule out all possible variables that have an effect on the usage time of the overall ecosystem and its different apps

Future Research

- Include additional mobile devices (iOS), platforms, apps, and audiences from different cultural backgrounds
- Explore whether the same effects apply today, 10 years after the initial data collection period
- Include additional control variables that might influence the usage time of the platform and its applications
 - Platform related elements like UX
- Study the effect of having Kakao Talk ID as a requirement for Anipang adoption
 - Would it make sense to have it as a requirement for other apps within the ecosystem as well?

Thank You!

Any questions?

