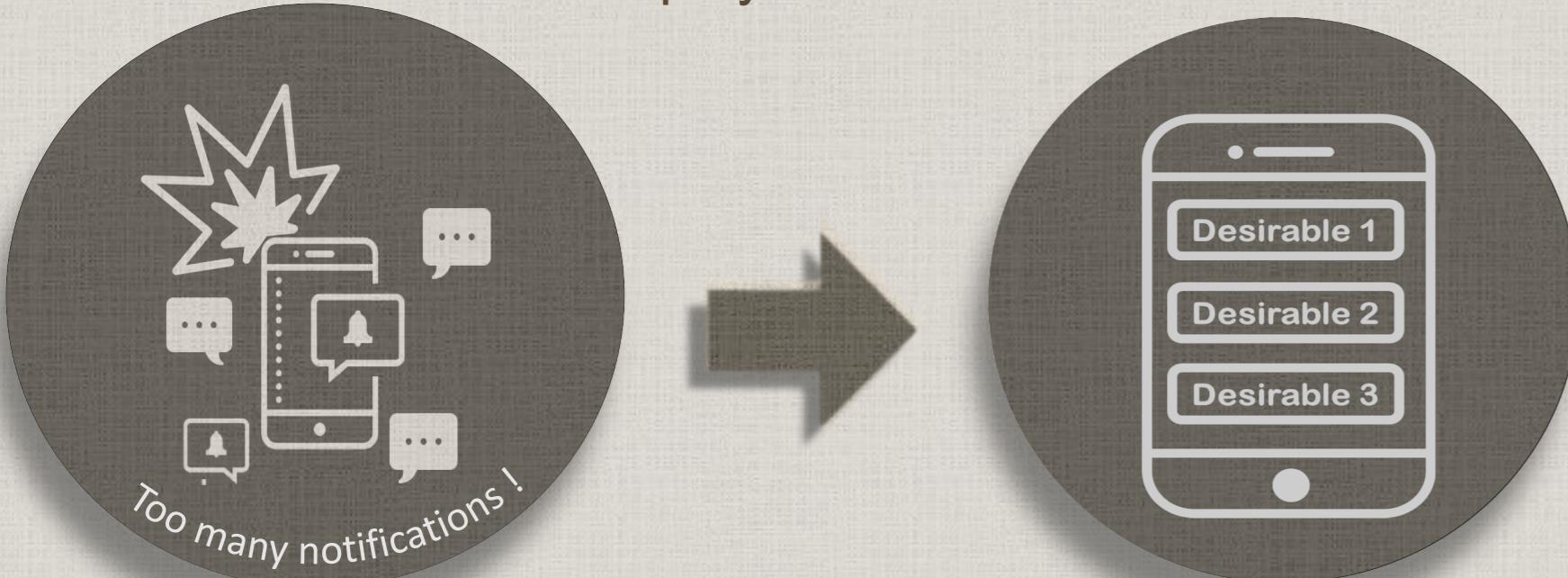


# A Preliminary Investigation of the Mismatch between Attendance Order and Desired Display Order of Smartphone Notifications

## Introduction

People receive hundreds of notifications in a day. If leaving too many unhandled, the notification drawer is unable to show all of them. To optimize the drawer, we want to understand which notification users want to attend first and what is their desired display order for drawer.



We present NotiSort which allows users to sort notifications to reflect their desired order. Four factors that may affect this order are proposed: importance, urgency, sender/app attractiveness, and content attractiveness.

## Research Question

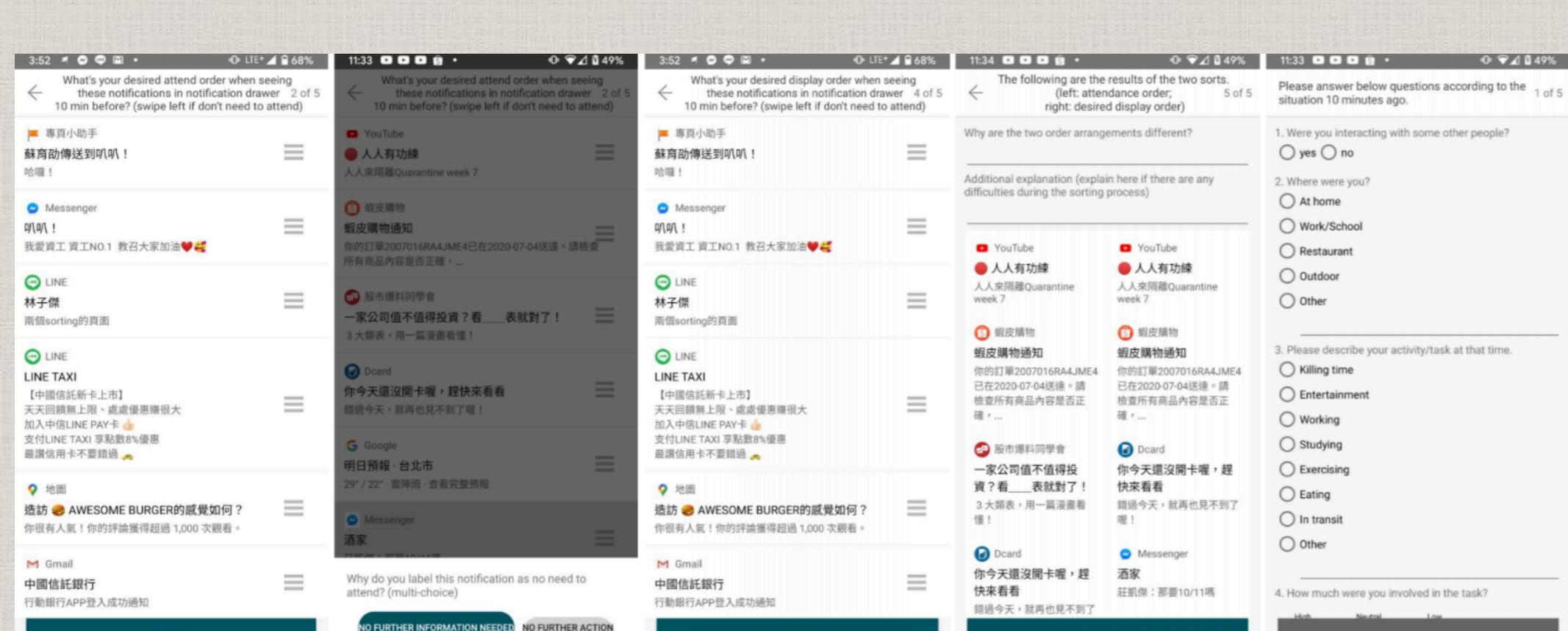
1. In what order do users attend to their notifications across various settings?
2. In what order do users desire their notifications to be presented in these settings?
3. In what situations are this attendance order and this desired display most likely to match or fail to match, and why?

## Method



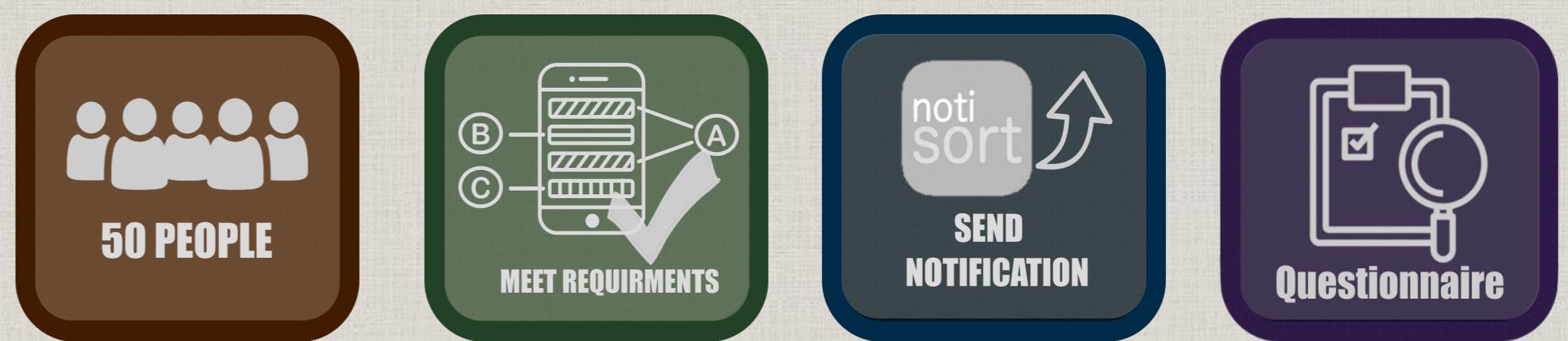
Collects contextual data and allows users to directly sort notifications.

- NotiSort records current active notifications. Users are prompt to sort them
- Via drag-and-drop, users can sort these notifications based on their attendance order/ desired display order
- After users sort the notifications, rate each notification in terms of the degree of four factors in a 5-point Likert scale question
- Users then will answer a questionnaire collecting the contextual information at that time
- If the attendance order and desired display order does not match, we would ask the behind reasons



## Data Collection

We used an experience Sampling method (ESM) study with 50 users to collect smartphone users' desired order and the degree of the four factors of notifications from users.



NotiSort sampled moments when the participant's notification drawer contained more than six notifications from more than three different applications. At up to five such moments per 24-hour period, it prompted the participant to answer a series of questions regarding notification order and their perceptions of the notifications that were present on his/her phone at the time.

## Results

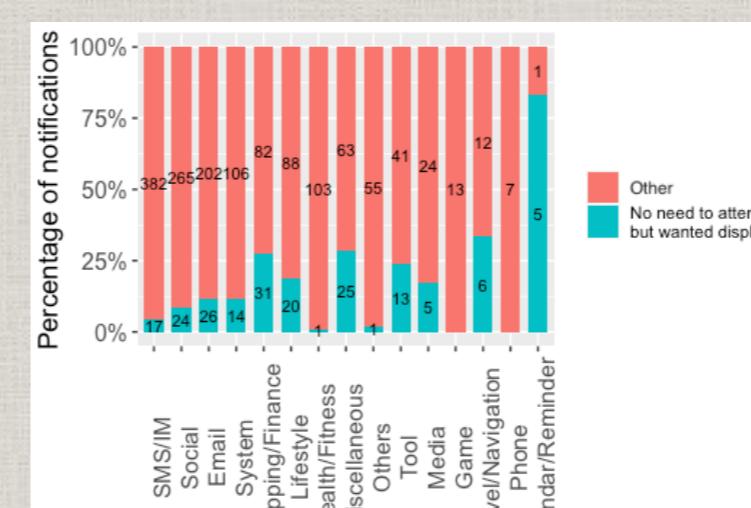


Figure 1

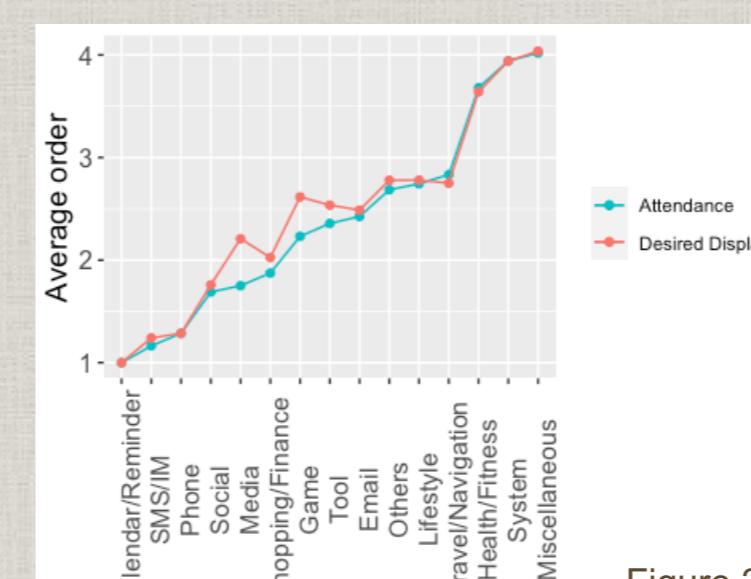


Figure 2

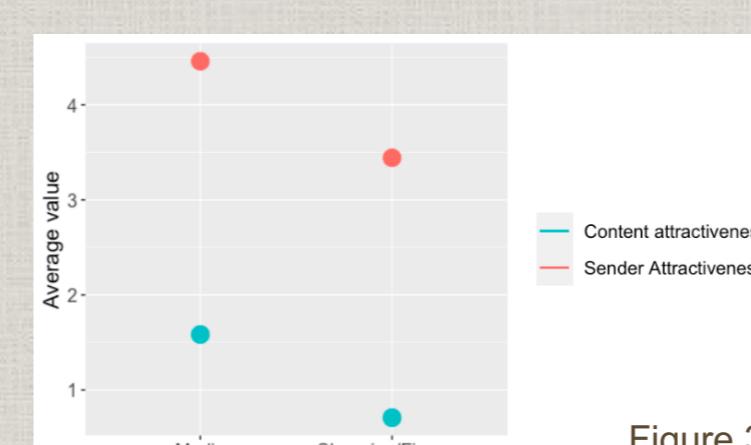


Figure 3

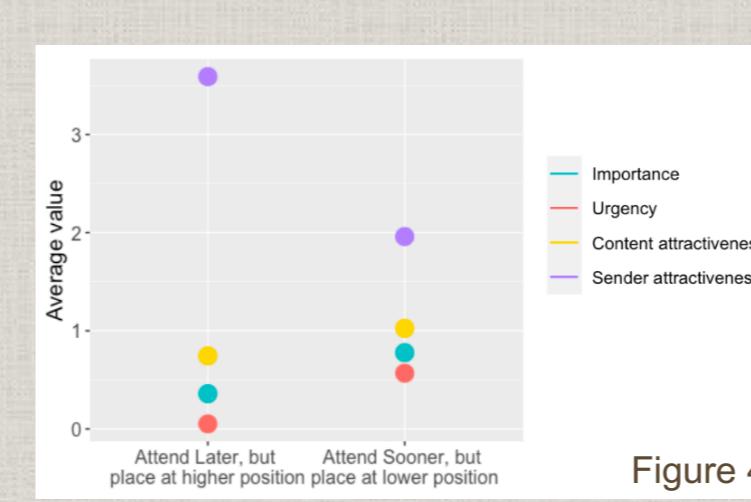


Figure 4

This is a preliminary result of 3 users.

Shopping/Finance and Calendar/Reminder categories contained the highest percentages of notifications that fit "no need to attend but still desired display". (Figure 1)

Within most notification categories, the averages of the attendance and display ranks were quite similar, confirming our intuitive assumptions. However, in four categories – Media, Shopping/Finance, Game, and Tool – the two ranks often differed from each other. (Figure 2)

By looking more deeply to these notifications, Media's content attractiveness and sender/source attractiveness were both rated more highly than Shopping/Finance notifications. Users did not always desire notifications to be displayed at a lower position simply because they were less attractive. (Figure 3)

Despite the fact that the participants would – in practice – click on notifications which sender attractiveness is relatively high later than they would on others, wanted to position these notifications with attractive senders prominently, probably to remind themselves that they had come in. (Figure 4)

## Future Work

Our preliminary results, despite being based on a small sample, show clear patterns of occasions in which users' desired display order for their notifications and their actual attendance to them differ. We expect that, once more participants are recruited, the full results of our ESM-based study will help to dramatically improve understandings of how notifications should be sorted.