Submission No. : C000045
Interaction Design

The Babysitting Co-op Revisited
Keywords: Behavioral economics, Nudge, Interaction design...

ISASE 2019

The Babysitting Co-op Revisited

– How to Nudge People to Investing in Babies –

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Abstract: We will have a look into an existing babysitting co-operative and discuss the effectiveness of nudge theory in behavioural economics. In the co-op, parents are exchanging coupons as a currency and babysitting their own children with each other. However, at some point, the co-op faced with severe supply-demand imbalance of coupons and went into "depression". We will offer a solution to adjust the imbalance by using mobile application with applying six major techniques of the nudge theory to its design.
Keywords: *Behavioural Economics, Nudge, Interaction Design, Recession-Inflation Seesaw*

1. INTRODUCTION

We will have a look into an babysitting co-operative and discuss the effectiveness of nudge theory in behavioural economics. This example of existing babysitting co-op has a significant meaning for us who are living in the country where many parents cannot even find a nursery for their children.

Childcare shortage is still a growing trend in Japan. The government recognizes this as crucial and is now trying to grasp the actual circumstances in the supply and demand of childcare. As a measure against this problem, it introduced a "childcare concierge", a consulting service for young parents in municipalities. [1] It is now gradually showing results. However, the potential demand for childcare might be far larger than we have estimated as Shimizudani and Noguchi argue. [2]

In this paper, we will offer a solution to adjust the imbalance of supply and demand of babysitting by using mobile application with applying six major techniques of nudge theory to its design.

2. BACKGROUND:
CAPITOL HILL BABYSITTING CO-OP

Capitol Hill Babysitting Co-op is an existing co-operative located in Washington DC. It was founded in 1950's and is still active now. In the co-op, parents living in the same district are exchanging coupons called "scrip" as a currency and babysitting their own children with each other. However, at some point, the co-op faced with severe supply-demand imbalance of coupons. That is to say, so-called a "liquidity trap" in a coupon economy.

Former members of the community, Joan Sweeney and Richard Sweeney, analyzed the plight with economic theories and concluded that this plight was caused by imbalances of "recession-inflation seesaw" which is generally observed in monetary economy. [3]

Under monetary economy, the price of babysitting will be increased if the number of sitters is scarce. Which, then, will encourage more people to babysit. At the same time, the increase will mitigate the demand for sitters because of the higher price. Thus, the balance between supply and demand will be achieved.

However, the market price of babysitting is fixed permanently at the same price because they have an invariable principle: one coupon for every one-half hour of babysitting. The price will not be adjusted as it will be in monetary economy. Then, the imbalance concludes with either of following results:

Case 1) Shortage of sitters.
Case 2) Shortage of job offers.

The Case 1) corresponds with inflation in monetary economy. People have enough coupons to use but cannot find sitters. That means coupons are supplied excessively. The value of a coupon is now too low to encourage people to babysit. In other words, they are facing with the shortage of incentives.

The Case 2) corresponds with what is called recession in monetary economy. In this case, people are reluctant to

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use coupons because they are too precious to use. They want to keep them unused for future special occasions. In this situation, coupons are excessively scarce. Even if you want to get precious coupons by doing babysitting, your neighbors also think of them as so precious that job offers will be decreased.

Case	State	Coupon	Value	Shortage
1	Inflation	Oversupply	Lower	Sitters
2	Recession	Undersupply	Higher	Job offers

Sweeneys insist you need to regard even this kind of regional community as an independent economic bloc. The co-op took three measures to overcome the plight:

1. Morals: Expect members not to hoard coupons.
2. Rules: Force them to use a coupon once in a while.
3. Supply control: Control the circulation of coupons.

By these measures, the babysitting co-op managed to recover from economic crisis which then reached to "depression", far beyond just "recession".

3. DISCUSSION:
SIX WAYS TO NUDGE POTENTIAL SITTERS

As we saw, the babysitting co-op took three measures to adjust the supply-demand imbalance: morals, rules and supply control. Here, we'd like to add one more measure to them, a "nudge".

A "nudge" is a concept in behavioural economics advocated by two economists, Richard Thaler, a Nobel laureate in economics in 2017, and Cass Sunstein. According to them, a nudge "alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives". [4]

Technologies enable us to watch the supply-demand balance far more precisely than counting coupons. So, the combination of this nudge theory and a technology like a mobile application can be a powerful tool. We will look into how we can watch and control the supply-demand balance by means of them.

Nudge theory has six major techniques. We will utilize each of them as measures against either or both of recession and inflation:

1. Defaults => Inflation
2. Structure complex choices => Recession & Inflation
3. Understand mappings => Recession & Inflation
4. Give feedback => Recession & Inflation
5. Expect error => Recession
6. Incentives => Inflation

In the following chapters, we'd like to apply them to the design of a mobile application and assess the effectiveness of each technique.

3.1 Defaults: Skipping Acceptance => Inflation

Opening the application, you firstly see the timeline of your friends' posts which show daily lives of them and their children. You might recall SNS like Facebook on your mind. However, this application is slightly different from Facebook because posts you see on the timeline are job offers of babysitting.

Usually, parents pick up sitters from potential candidates, reviewing their resume. On the contrary, in this application, sitters choose babies. And all parents themselves are potential sitters.

Each recruiting post has buttons with a specific date and time which represent future schedule of your babysitting. However, the post doesn't have an "accept" button on it. You are being nudged to choosing one of presented options.
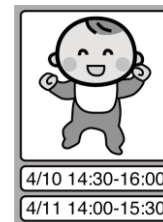
Before asking you if you accept the offer or not, it shows schedule options. Of course, you can ignore these offers if you like. If you are not in the mood, you can just leave them. However, by showing schedule options as a default, this application urges you to babysit.

Here, "defaults" work as a measure against inflation. They encourage more people to babysit when the number of sitters is scarce under inflation.

3.2 Structure Complex Choices: Filtering Algorithms => Recession & Inflation

Algorithms optimize which and to whom recruiting posts are to be shown. Which enhances the matching rate between babies and sitters. For example, the distance between babies and sitters is taken into account by the algorithms. It's easier for you to accept offers posted by parents who live in nearer places from you. "Time" is also important factor. Imminent but still open offers should be shown preferentially at higher places in the timeline.

Algorithms also should refer to indices like "education history" or "household income". The price of time is not

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always the same between people. [5] Hatred tends to arise when there is income gap between people. Referring to these indices, algorithms mitigate potential friction between parents and sitters.

This is effective against recession where the number of job offers is scarce. Which is because this enhances the security of babies and encourages more parents to recruit sitters.

These matching algorithms enable parents to show their recruiting posts to more proper sitters at more proper timing. Also, these filters narrow down wide variety of choices a sitter can face with and decrease the cost of choice.

3.3 Understand Mappings: A Histogram => Recession & Inflation

Visualization is one of efficient ways to nudge people. In this application, you can see an icon of a baby at the top of the screen. It visualizes the status of the balance between supply and demand of babysitting.

When the supply is sufficient, it shows smiling baby.

When the supply is insufficient, it shows crying baby.

The facial expression changes according to the state of the balance sheet. It directly appeals to the feelings of potential sitters. The application always shows this icon at the top of the screen so that a user can grasp the supply-demand balance any time.

The next to this baby's icon, it shows a histogram which indicates hourly forecast of the supply-demand balance of babysitting on the day.
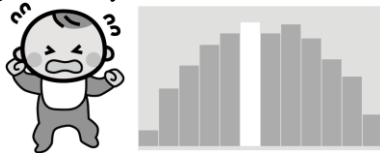
The histogram teaches you when you should babysit or use your coupon. Which naturally restrains the congestion of babies and sitters in the day.

This visualized information makes users understood what their behaviour means in a community at a certain time. You can urge people to behave more properly in a community by nudging instead of binding people with morals or rules or controlling the circulation of coupons.

3.4 Give Feedback: Point System => Recession & Inflation

This application has a point system. This "point" is nothing to do with the value of a coupon. This point system is a kind of evaluation system against a user's behaviour. The more favorably you behave in the community according to the supply-demand balance sheet, the more points you can get as a reward. In short, you can get higher points when the demand is higher and the supply is lower. Contrary, the point will be lower when the demand is lower and the supply is higher.

Demand	Supply	Points
Higher	Lower	Higher
Lower	Higher	Lower

The histogram shows the hourly forecast of the balance sheet. Which means it shows, at the same time, the rise and fall of the points you can get. A time zone with the highest column in the histogram is, thus, the best timing to earn points in the day.

You can also acquire points as a reward for your babysitting. Parents evaluate your job and give you points according to their satisfaction level. Pleasing someone can be a strong incentive for one. You will be doubly rewarded by their smiles and points.

Points represent evaluation of your behaviour from the community. This kind of feedback optimizes behaviour of a user to good direction on the whole.

3.5 Expect Error: Rating Sitters => Recession

According to the points, you will be rated as either of a "gold sitter", a "silver sitter" or a "bronze sitter". The color of your profile changes according to the ranks.

Less qualified sitter will rank lower. Inevitably, parents will be nudged to recruiting sitters in higher ranks. By reducing transaction opportunities of less qualified sitters, or "lemon" sitters in asymmetric market as you may say, you can secure the safety of babies.

This kind of ranking enables us to reduce matching errors. Expecting errors beforehand, then you can nudge people to evading them.

3.6 Incentives

In 2015, Mark Zuckerberg, a CEO of Facebook, donated billions of dollars to a charity. What did motivate him? Did he want to do something good to the world, or show off his bounty to the world? In behavioural economics, you can classify motivation into two types: external motivation and internal motivation. We need to

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think about both types of motivations to nudge people effectively.

3.6.1 External Incentives: Rankings => Inflation

External motivation is based on evaluation from others. So, showing rankings of highly rated sitters at noticeable places in the application can be effective to externally motivate them to babysit more.

People will mind other's eyes. Rankings or ratings of these kinds stimulate external motivation and give them incentives to do things seen favorable to others.

3.6.2 Internal Incentives: Growth Diaries => Inflation

On the other hand, people can be motivated internally. People have a mind to do things for others heartily and voluntarily even if it's sometimes accompanied by pains. How can sitters be motivated internally?

For example, it is viable by showing daily diaries of babies to them. Once you babysit, their diaries will be unlocked to you. The more you babysit, the more posts you will be able to see. Sitters will be kept connected with babies after their job. Seeing babies on daily posts can be great incentives for sitters. Sitters can share a feeling of raising the baby collaboratively with the parents by seeing the process of the baby's growth.

Some research shows that the satisfaction level of IKEA's customers tends to be higher than other furniture makers'. After buying a piece of furniture at IKEA, you need to assemble it by yourself. It deepens your affection to it. This "IKEA effect", which is also known as an "endowment effect" in behavioural economics, explains that the more time and effort you pour into it, the deeper your affection will be. To put that theory into babysitting, sitters tend to have more affection into a baby they have babysat than others.

Sitters invest their time and effort in babies. For them, the growth of a baby itself is equivalent to the return on investment. Seeing the process of their growth will nudge them and motivate them internally. Thus, a nudge promotes more efficient and healthy investment in babies.

4. CONCLUSION

In discussions above, we applied nudge theory into the design of mobile application and assessed the effectiveness of its six major techniques:
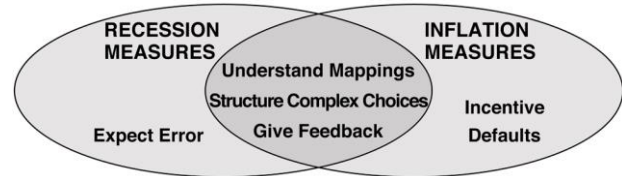
iNcentives (3.6)
Understand mappings (3.3)
Defaults (3.1)

Give feedback (3.4)
Expect error (3.5)
Structure complex choices (3.2)

As you can see, the initial alphabets of each technique can be read as "NUDGES". As we discussed, each of them is effective for either or both of recession and inflation in a babysitting community.

By applying these techniques into the design of an application consciously, you will be able to control behaviour of users more effectively for their own good.

In the age of Sweeneys, these theory and technology didn't exist. However, they are now available and awaiting for us to utilize them to run a mutually supportive community like the babysitting co-op more effectively.

NOTES

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