

# 利他性を促進するナッジエージェントの開発

## Designing nudge agents that promote human altruism

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**Abstract:** Previous studies have found out that Nudge is a key technology to promote altruism in human-human interaction. It seems that Nudge is a potential and effective mechanism for promoting the Altruistic behavior. But in the field of human-agent interaction (HAI), there is still a lack of study on confirming the effect of Nudge to altruism. In this work, we experimentally investigated nudge techniques are useful to implement nudge agents which can promote human altruism in HAI. The experiments were conducted online with peak-end effect and multiple views as independent variables and the results were treated statistically.

## 1. Introduction

Altruism as a central issue in our evolutionary origins, social relations, and societal organization [1], it is important for us to find the proper way to enhance it in our daily life. But there still a lack research on Altruism in the field of HAI. Considering there is a lot of factor that need to verify (i.e., behavior, appearance...) and two different way for participants to engage (first-person point of view and third-person point of view), this time we investigate whether the behavior of agents can promote the human altruism by video stimulation [2] through online experiment.

## 2. Related works

In recent years, Nudge, changing people's behavior without forbidding any options or significantly changing their economic incentives[3,4], is considered to be the effective way that promotes people to do altruistic behavior. Valerio *et al.* have found that moral nudges (i.e., making norms salient) can promote altruistic behavior and even have effects over time [5]. Nie *et al.* have found that different colors may alter the altruistic behaviors of people and have shown that blue enhances altruism and red

discourage altruism. But they all did not consider the effect and the influence caused by the agent around us. In view of human-agent interaction, we consider applying the proper nudge method to promote human altruism.

Ana *et al.* divide Nudge into 23 mechanisms and position all of them into one graph along the two axes: mode of thinking engaged (i.e., automatic vs. reflective) and the transparency of a nudge (i.e., if the user can perceive the intentions and means behind; see Fig.1) [6].



Figure.1 Nudges positioned along the transparency and reflective-automatic axes [6]

Basing on the characteristic of altruism, the approp-

iateness of application to agents, and ethical questions, this time we choose two mechanisms as our factor one picked from the manipulating behavior (bottom left quadrant) —basing the memory and the other from the promoting reflective choice (top-right quadrant) — provide multiple viewpoints. The method of biasing the memory is called the peak-end rule suggesting that our memory of past experiences is shaped by two moments: their most intense (i.e., peak) and the last episode (i.e., end) [7]. The other factor is called providing multiple viewpoints which means collecting different points of view (two or more than two views) for an object or event and offering an unbiased clustered overview, also shows good performance at avoiding the confirmation bias [8] which leads us to pay little attention to or reject information that contradicts our reasoning.

### 3. Method

Basing on the factor mentioned in chapter 2, we make the following hypothesis.

**H1:** Participants who watch the peak-end positive video get a higher score than those who watch the peak-end negative video.

**H2:** Participants who watch the video contain two viewpoints get a higher score than those who watch the video only contain one viewpoint.

We first asked participants to read the introduction of the experiment. Second, the participants were asked to watch the video which was the stimulation in our study. Then the comprehension questions were asked to make sure that participants finish the video. Finally, the questionnaire for scoring the altruistic personality was asked.

The scenarios are designed by peak-end rule and providing multiple viewpoints.

For the peak-end rule, because it is hard to define the peak in the video scenario, we only use the end rule in our experiment. We design two types of scenarios, one put the altruistic behavior at the end of the video (peak-end positive) and the other one put the altruistic behavior at the beginning of the video (peak-end negative).

For the providing multiple viewpoints, this time we only consider comparing the video stimulation which contains two viewpoints to which contains only one viewpoint. The video shows both altruistic behavior and selfish behavior in the scenario of two viewpoints and shows only altruistic behavior in the one viewpoint scenario.

Basing on the factorial design we have four types of scenarios (see Table.1). For each scenario, the vertical axis

shows the property of the behavior (Altruistic/Selfish/Trivial) and the horizontal axis shows the time of the video.

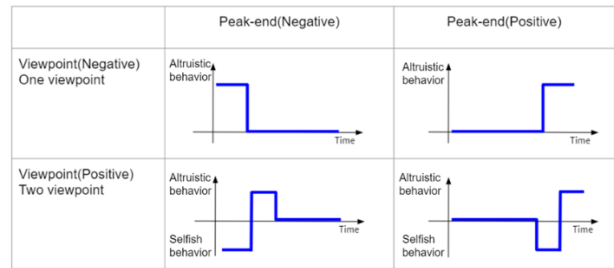


Table.1 Scenario type

After finishing the comprehension questions, participants did a questionnaire for measuring their altruistic score. The base of the questionnaire is from Philippe *et al.* [9] and this time we use the translated version by Kiguchi [10] for the Japanese participants (see Table.2). The details are as follows. Each of these ratings was to be made on a 5-point scale (Never / Once / More than once / Often / Very often). A higher score refers to a more altruistic personality.

	し た こ が な い	1 度 し た こ が あ る	数 回 し た こ が あ る	しば しば し た	いつ も し た
1.列を並んでいて、急ぐ人のために順番を譲る。					
2.お店で、渡されたおつりが多かったとき、注意してあげる。					
3.ころんだ子供を起こしてやる。					
4.あまり親しくない友人にもノートを貸す。					
5.気持ちの悪くなった友人を、保健室などに連れていく。					
6.友人のレポート作成や宿題を手伝う。					
7.列車などで相席になったお年寄りの話し相手になる。					
8.気持ちの落ち込んだ友人に連絡する。					
9.何か探している人には、こちらから声をかける。					
10.バスや列車で、立っている人に席を譲る。					
11.酒に酔った友人などの世話をする。					
12.雨降りの時、あまり親しくない友人でも傘に入れてやる。					
13.授業を休んだ友人のために、プリントなどをもらう。					
14.家族の誕生日や母の日などに、家に電話したプレゼントしたりする。					
15.見知らぬ人がハンカチなどを落とした時、教えてあげる。					
16.知らない人に頼まれて、カメラのシャッターを押してあげる。					
17.バスや列車で、荷物を網棚にのせてあげる。					
18.知らない人が落として散らばった荷物を、一緒に集めてあげる。					
19.ケガ人や急病人が出たとき、介抱したり救急車を呼んだりする。					
20.自動販売機や切符売機などの使い方を教えてあげる。					

Table.2 Altruism scale [10]

## 4. Result

A total of 128 subjects participated in our study from the YAHOO! crowdsourcing. (Gender male: 87; female: 41. Age mean:47.25; range:16~72; SD:10.7899) The number of participants is counted by G\*Power [11].

To investigate the interaction and main effects of the two factors with two-level for each, a  $2 \times 2$  two-way ANOVA (between-participants) was conducted. The result shows that the interaction between peak-end rule and providing multiple viewpoints is no significant ( $F(1,124) = 2.95, p = 0.09$ ). The main effect of providing multiple viewpoints also not significant ( $F(1,124) = 0.7691, p = 0.38$ ) which rejected H2. The main effect of the peak-end rule is significant ( $F(1,124) = 10.22, p = 0.00$ ) and it shows that participants have a higher altruism score if they watch the video basing on the peak-end negative scenario than the peak-end positive ones (see Fig.2) which rejected H2.

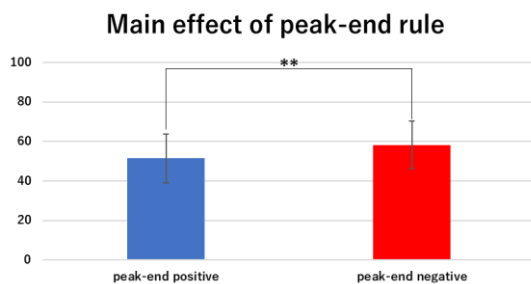


Figure.2 Main effect of peak-end rule

## 5. Discussion

The main effect of the peak-end rule shows the behavior of agents can influence human altruism. Although it rejected our hypothesis and shows that the peak-end negative scenario performance better enhances human altruism, it may also reflect the difference between human-human interaction and human-agent interaction.

## 5. Conclusion

We are looking forward to applying more tasks in this video stimulation and to see how it works on promoting human altruism which is an important issue in our evolutionary origins, social relations, and societal organization.

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