

Understanding the Perception of Effectiveness and Acceptability of Nudges in Japan

○Luiza CULAU, Katsuya YAMORI, Genta NAKANO

In Japan, the national and the local governments have attempted to prepare citizens for potential natural disasters by improving the school curriculum, organizing activities such as evacuation drills and enacting rules and regulations such as building standards. There is however, an alternative approach to disaster risk reduction (DRR) efforts that does not necessarily include education or laws: approaches known in behavioral economics as “nudges.” In order for an intervention to be considered a nudge it must cause behavior change in a predictable way; it must not forbid any options or make a significant change in economic incentives and finally it must be easy and cheap for people to avoid[1].

Some of the most well-known nudges are also quite cheap or even free to implement, such as the use of default options in forms [2] (people tend to abide by defaults because of psychological inertia), changing the order of objects (such as food in a cafeteria[3]), and advertising social norms (people tend to follow what the majority of people in their society are doing. As an example of how social norms affect decision making, a study from Kuhfuss et al. showed that farmers in France were successfully nudged to continue using “pro-environment” practices when they learned other farmers from their region were using these practices [4]).

In DRR, one problem in researching nudges is that some theories could be tested only during the occurrence of an actual disaster (which can be hard to forecast) and it would require cameras recording people’s reactions (which is controversial and hard to implement). One way to test nudges without the

occurrence of an actual disaster is through VR. For example, Fujimi and Fujimura used virtual reality (VR) to test the effects of leading evacuees and using a trapezoidal river design (both of which are nudges that appeal to human herd-behavior instinct and visual cues) to encourage people to evacuate from a flood, concluding that the groups that received the nudges evacuated earlier than groups that did not [5].

Because of the variety of nudges which can be quite overwhelming to study, first of all I attempted to classify and categorize nudges. I will start by showing the classification, which attempts to better differentiate between interventions that can be considered “nudges” and those based on education, which I call “judges” and those based on legislation which I call “obliges” (together, they are referred as NJO). Next, I talk about a nudge categorization based on how nudges are delivered (through positioning, design, sounds, etc) which allows to differentiate between nudges when studying them.

This classification of NJO and categorization of nudges was used to create a questionnaire survey which the results allow me to analyze the views of Japanese people regarding the NJO’s acceptability and effectiveness in influencing people’s behavior. From the results of the survey, I conclude that the most favorable nudges according to Japanese citizen’s opinions in terms of effectiveness and acceptability are those used in an emergency scenario (when a disaster is imminent) that also convey useful information. I will then discuss how, as much as a survey can give useful insight in terms of nudges acceptability, it is not the best way to test nudge

effectiveness since nudges a lot of times influence people without people realizing they are being influenced and therefore people can not evaluate how these nudges have already worked for them or will work for them.

Based on the conclusions of the survey as well as other reasons such as the need to test nudges' effectiveness in real life, I decided to create a serious game using nudge concepts. The target area chosen for testing the game "Kuroshio no Himitsu", is Kuroshio town. Kuroshio is a small town which had 10,262 inhabitants in 2020 according to a census of the same year from the Statistics Bureau of Japan [6] (see figure 13 which shows the area of Kuroshio town). In Kuroshio town, most family's income come from fishing, salt and agriculture industries [7]. The town also receives many tourists that come specially for water sports, gastronomy or pilgrimage [8]. The town faces the Pacific Ocean and is at risk of a Nankai-Tonankai Trough earthquake and tsunami [9]. Some parts of Kuroshio Town are at risk of a maximum estimated tsunami of 20 meters [10], and as little as 16 minutes to evacuate to high ground after an earthquake strikes [11]. Tourists or students coming from outside Kuroshio town are especially vulnerable to tsunamis because they are less likely to be familiar with the town's evacuation areas and routes and may not be aware of the region's history of disasters.

Kuroshio no Himitsu's main goal is to motivate people to visit evacuation areas and touristic spots, while learning about the culture and history of Kuroshio town. In the game, players look at their position on a map and walk to these spots in order to complete missions and read the story of the game. Finally, the game can be finished in about one hour so even people who are only coming to Kuroshio as visitors can get a chance to play and finish the game. The game was made available to the general public in December of 2021, and the results gathered from the game were evaluated in early January 2022. In

conclusion, the game "Kuroshio no Himitsu" proved to be less effective than expected to nudge people, confirming the results of the survey which were not very favorable of a game-based approach. However, continuous observation of Kuroshio no Himitsu game data in summer when the number of tourists increase in Kuroshio Town could prove otherwise.

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