

# Accepting attitude toward a final disposal facility of mercury wastes with increase of cognitive aversion toward mercury

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## INTRODUCTION

Mercury is highly toxic and its methylated species have bioaccumulative properties (Morel et al., 1998). According to the Minamata Convention on Mercury, accepted on Oct. 2013 and effectuated on Aug. 2017, the final disposal of mercury wastes in environmentally safe ways is required. Mercury disposal in controlled landfill sites might be a feasible option (Lee and Lee, 2012). On the other hand, building public acceptance for construction of landfill sites for final mercury disposal is expected to be difficult. The major factors influencing public acceptance are risk perception, benefit perception and public attitude (Alhakami and Slovic, 1994; Slovic et al., 1991). The author focused on cognitive aversion toward mercury (Takahashi, 2020) because it might give a non-negligible impact on public attitude toward mercury final disposal facility. In this study, a relation between cognitive aversion toward mercury and accepting attitude toward the final disposal facility would be presented and discussed.

## MATERIALS AND METHODS

### Quantification of cognitive aversion toward mercury

Cognitive aversion toward mercury was quantified by pairwise comparison method using modified Scheffé's approach (Nakaya variation model (Nakaya, 1970)). The details of mercury aversion quantification were reported by Takahashi (2019). Mercury aversion is the average aversion among the survey participants, not personal aversion. Therefore, personal aversions toward mercury were calculated based on personal scores given to mercury in all comparisons between mercury and other hazardous objects weighted by the difference of average aversions, as described in Eq. 1.

$$A_m = \sum_{j=1}^K Z_{Hg,j,m} |A_{Hg} - A_j| \quad (\text{Eq. 1})$$

where  $A_m$  is personal mercury aversion of person  $m$ ,  $K$  is the number of the objects,  $Z_{Hg,j,m}$  is personal scores given to mercury in binary choice between mercury and the other object  $j$ ,  $A_{Hg}$  and  $A_j$  are average aversion toward mercury and the other object  $j$ .

### Quantification of personal attitude toward mercury final disposal facility

Acceptance or rejection attitude toward landfill site construction for mercury final disposal were also asked to the questionnaire respondents using five Likert scale to evaluate the impact of mercury aversion on the judgement. High score means accepting attitude in this case. Web questionnaires were conducted twice using QuickMill®, Macromill Inc., Japan in Mar. 2018 and Dec. 2018. The number of the survey participants, sample size, were 1030 for the first questionnaire and 420 for the second questionnaire, respectively.

## RESULTS AND DISCUSSION

Cognitive aversion toward mercury was compared with personal attitude scores. The results are shown in Figure 1. When personal attitude shifts from neutral to rejection, cognitive aversion becomes stronger. It is reasonable because subjective strong aversion toward waste management facilities is a significant factor determining the choice behavior (Giaccaria and Frontuto, 2012). On the other hand, personal attitude shifts from neutral to acceptance in spite of the increase of cognitive aversion. It suggests that accepting attitude is not resulted from weak aversion toward mercury. In spite of strong aversion, some persons took accepting attitude in rational judgement sense.

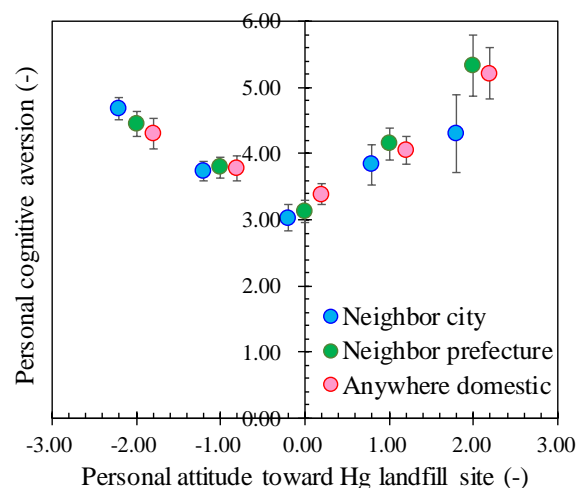


Figure 1. Comparison of cognitive aversion and personal attitude

## CONCLUSION

This study investigated cognitive aversion toward mercury and personal attitude toward mercury final disposal facility. This study found that the attitude shifted from rejection to acceptance in spite of the increase of cognitive aversion. This suggests that weak aversion will not contribute into accepting attitude.

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