

# Ambiguity Tolerance Can Improve Through Poetry Appreciation and Creation

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## Research Article

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# Abstract

Ambiguity tolerance is an individual trait of preference for ambiguity that can be transformed by intervention. It is known that appreciation and discussion of art can improve ambiguity tolerance, but the effects of appreciation and discussion have not been separated, and there have been psychometric limitations. This study examined the effects of appreciation and creation on ambiguity tolerance using haiku, which are characterized by ambiguity and have been created by Japanese in their educational curriculum. The 152 participants in the zoom experiment answered the Multidimensional Attitude toward Ambiguity Scale at five time points: before and after haiku appreciation and creation, and one week later. The results showed that the absolutism, which is one factor of the attitude toward ambiguity, decreased after the appreciation and creation of haiku, and this effect persisted after one week, indicating that cognitive changes occurred through the appreciation and creation, which require various interpretations and choices.

# Introduction

Ambiguity tolerance, defined as a preference for ambiguity (for reviews see Furnham & Ribchester, 1995; Furnham & Marks, 2013), is an individual characteristic that can be transformed by interventions (Endres et al., 2015). Interventions such as mindfulness (Spinelli et al., 2022) and case methods (Banning, 2003) have been examined for their effects on ambiguity tolerance, although the effects differ. Among them, an art-based intervention improved medical students' ambiguity tolerance by viewing and discussing artworks (Bentwich & Gilbey, 2017). Although the study had some limitations, such as the psychometric validity and reliability of using only a single item to measure ambiguity tolerance and the lack of separation between the effects of art appreciation and discussion, it suggested that art appreciation may increase ambiguity tolerance. Recently, ambiguity tolerance has been recognized as a multidimensional trait that includes affective (discomfort with ambiguity), cognitive (absolutism), and epistemic (need for complexity and novelty) aspects (Lauriola et al., 2016); further, it is interesting to clarify how art interventions affect any of these factors. Most importantly, previous studies that have examined the relationship between ambiguity tolerance and art (Bentwich & Gilbey, 2017; Muth et al., 2015; Swami et al., 2010) have only explored aspects of appreciation and have not examined the relationship with art creation. Therefore, this study will examine the effects of art appreciation and creation on ambiguity tolerance from a multifaceted perspective using haiku poetry, which is characterized by ambiguity and is easy to create due to its small number of syllables and familiarity in the classroom (Hitsuwari & Nomura, 2022). It is expected that the appreciation and creation of haiku will have a positive effect on ambiguity tolerance; that is, the discomfort with ambiguity and absolutism will decrease, and the need for complexity and novelty will increase.

# Method

This experiment was approved for ethical approval by Kyoto University (CPE448) and all methods were performed in accordance with the relevant guidelines and regulations. Data and materials are available

online ([https://osf.io/gsm3a/?view\\_only=94cfe940568a4741914a62f99d5c91a3](https://osf.io/gsm3a/?view_only=94cfe940568a4741914a62f99d5c91a3)).

## Participants

One hundred fifty-two participants ( $M_{age} = 40.25 \pm 10.82$ , 53 males, 98 females, and one other) collected through a crowdsourcing website participated in an online experiment using zoom and all of them signed informed consent. Twenty to thirty people participated in each zoom session, which was conducted six times. The ambiguity tolerance was measured in an experiment that examined how haiku creation style affects the quality of work and subsequent evaluation of works (Hitsuwari & Nomura, in prep), and participants were randomly assigned to three groups: many creation, deep creation, and control.

## Material

Ambiguity tolerance was measured using the Multidimensional Attitude toward Ambiguity Scale (MAAS), which was developed by Lauriola et al. (2016) and developed and validated in Japanese by Hitsuwari and Nomura (2021). This scale can measure ambiguity tolerance using three dimensions: affective (discomfort with ambiguity), cognitive (absolutism), and epistemic (need for complexity and novelty). Twenty-one items (seven items for each subscale) were asked using a 7-point scale.

## Procedure

MAAS was measured at five time points: at the beginning of the experiment, after pre-appreciation, after creation (no creation in the control group), after post-appreciation, and one week after the experiment (Fig. 1). In the pre-appreciation, five haiku and five Japanese ink paintings were rated on four items: beauty, awe of the work, awe of the author, and difficulty in creation. Then, the participants in the many creation condition were instructed to “make a lot of haiku and choose one of them,” whereas the participants in the deep creation condition were instructed to “think deeply and make haiku.” In the control condition, no creative writing was performed, and the evaluation task of the slogan was performed for 20 minutes. In the post-appreciation, 20 works each of haiku and ink painting were evaluated with the same items as in the pre-appreciation.

## Results

For each subscale of the MAAS, we conducted a two-way ANOVA with three levels of conditions (many creation, deep creation, and control) and five levels of time points (Fig. 2). First, for discomfort with ambiguity, the condition ( $F(2, 134) = .14, p = .87, \eta^2 = .002$ ), time point ( $F(2, 134) = 1.05, p = .37, \eta^2 = .001$ ), and interaction ( $F(2, 134) = 1.11, p = .35, \eta^2 = .003$ ) were not statistically significant (Fig. 2a). For Absolutism, the main effect of time point was statistically significant ( $F(2, 134) = 5.73, p < .001, \eta^2 = .005$ ), while the conditions ( $F(2, 134) = .94, p = .40, \eta^2 = .01$ ) and interaction ( $F(2, 134) = 1.14, p = .34, \eta^2 = .002$ )

were not. For the effects of time points, multiple comparisons using the Bonferroni method showed that scores were lower at time points 4 and 5, compared with those at time point 1, and at time point 4 than at time points 2 and 3 (Fig. 2b). Finally, for the need for complexity and novelty, the main effect of time point tended to be statistically significant ( $F(2, 134) = 2.47, p = .07, \eta^2 = .003$ ), whereas the condition ( $F(2, 134) = 1.36, p = .26, \eta^2 = .02$ ) and interaction ( $F(2, 134) = .96, p = .45, \eta^2 = .002$ ) were not.

## Discussion

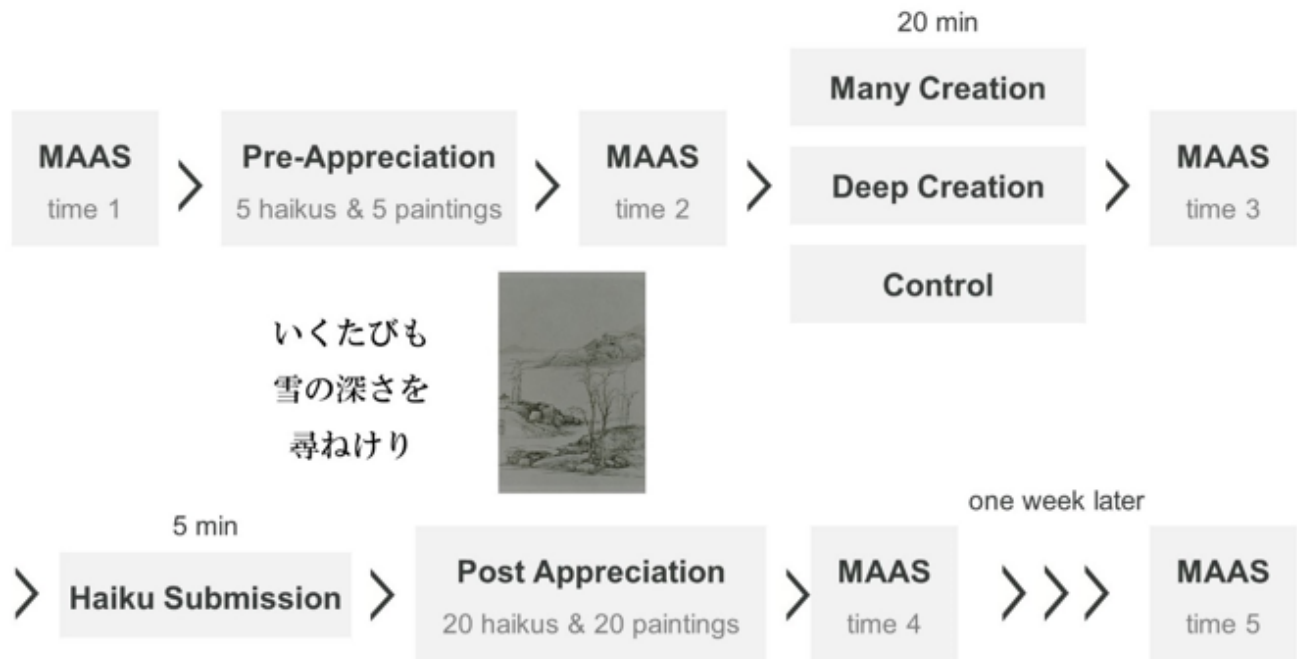
Among the dimensions of ambiguity tolerance, the affective and epistemic dimensions did not differ before and after the art intervention, but the cognitive dimension revealed a decrease in the tendency of absolutism after the appreciation and creation of haiku. This effect persisted after one week. The decrease in the tendency of absolutism to not allow for multiple conclusions or graded answers was supported by a previous study (Bentwich & Gilbey, 2017), in which only one item, “Accept multiple possible meanings,” was tested before and after art appreciation and discussion. Since haiku, with its characteristics of ambiguity, allows for a wide variety of interpretations (Hitsuwari & Nomura, in revision), it is likely that cognitive changes have occurred. This is also the first finding that shows the effect of art creation, as well as the appreciation of ambiguity tolerance. Haiku is recognized around the world and is used in language classes even outside of Japan (Blasko & Merski, 1998). Therefore, this finding is meaningful for education and society.

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## Figures



**Figure 1**

Procedure of The Experiment

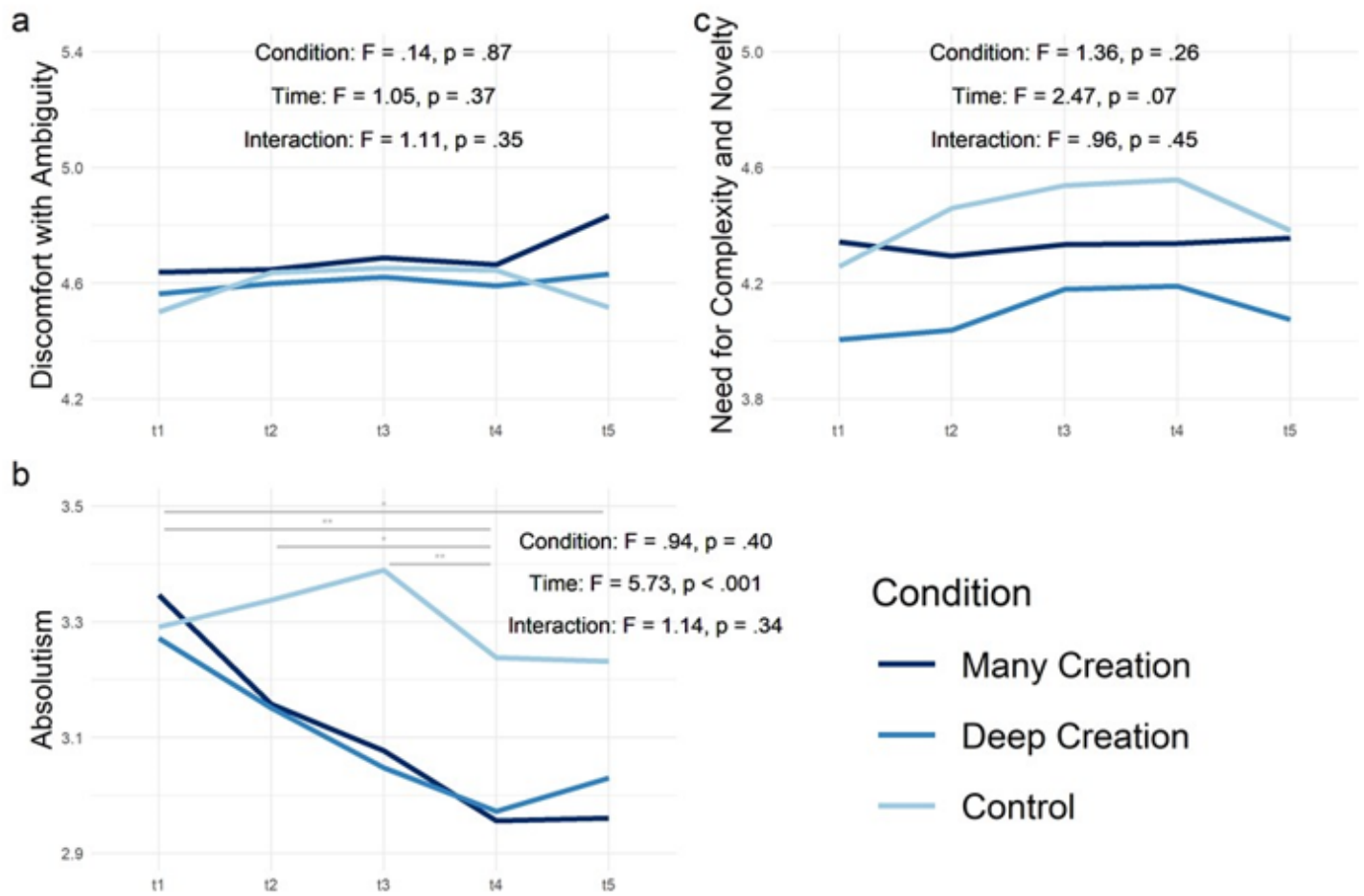


Figure 2

Plot of each subscale of MAAS by time point