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Research Articles

Draw Squares, and You Will Discover That Many Competent and Rigorous People Are Around You: Shape Priming Influences Impressions Regarding the Interpersonal Environment

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Abstract

The effects of drawing circles and squares on personality judgments in a metaphor-consistent manner, the round-warm and square-competent associations were investigated. We conducted a study in which participants drew as many circles or squares as possible and responded to a questionnaire assessing their interpersonal environment. Results showed that participants in the round condition responded that there were significantly more warm people around them than those in the square condition, and those in the square condition responded that there were significantly more competent and rigorous people around them than those in the round condition. These findings confirmed the metaphor-consistent effect of shapes on social perceptions.

Keywords: shapes and personalities, metaphor, embodied cognition

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Lakoff and Johnson (1980, p. 5) explained that “the essence of metaphor is understanding and experiencing one kind of thing in terms of another”, and proposed the conceptual metaphor theory (CMT) in which metaphors create meanings at a cognitive level. CMT assumes that shapes and social perceptions are closely related, as can be inferred from actual linguistic expressions. For example, in Japanese, “*marui*” (round) insinuates warm and mellow and “*shikakui*” (square) insinuates logical, rigorous, and competent. These expressions support CMT by implying a relationship between abstract concepts (personality) and concrete ideas (shapes). Recent studies have reported that shape priming influences the judgments regarding personality in a metaphor-consistent manner; such that round shapes are associated with warmth and square shapes are associated with competence. For example, Liu, Bogicevic, and Mattila (2018) argued that angular shapes activate competence trait, whereas circular shapes activate warmth trait. Okamura and Ura (2018) focused on the effects of the shape of eyeglasses on personality judgments regarding others. They proposed that judgments of many personality items could be influenced by the shape of eyeglass, especially with respect to the traits of warmth and competence. Results indicated that a face wearing round eyeglasses was perceived as warmer, whereas a face wear-

ing square eyeglasses was perceived as more competent and rigorous. Moreover, Okamura and Ura (2017) reported that the shape of eyeglasses affected judgments regarding our own personality: imagining wearing round eyeglasses resulted in warmer evaluations, whereas imagining square eyeglasses resulted in more competent and rigorous evaluations about the self. Moreover, Okamura (2018) demonstrated that square eyeglasses are more frequently associated with highly intellectual occupations. The authors explained the mechanisms of these findings in terms of metaphors. Since people think of abstract concepts in terms of more concrete concepts by using metaphors, the activation of round or square (concrete) concepts could influence personality (abstract) concepts in a metaphor-consistent manner. The effects of their activation in a metaphor-consistent manner (*metaphoric transfer strategy*) have repeatedly been demonstrated in research on embodied cognition (see Landau, Meier, & Keefer, 2010). Though not having been discussed in terms of metaphor, several marketing research have shown that shapes play an important role in consumers' judgments and behaviors. According to these knowledge, there is consistent evidence that round shape elicits a sense of softness, comfort, and friendliness (when taken together, these are related with "warmth" traits), whereas square shape triggers a sense of hardness, durability, and individuality (when taken together, these are related with "competence" traits) (e.g., Jiang, Gorn, Galli, & Chattopadhyay, 2016; Maimaran & Wheeler, 2008; Zhang, Feick, & Price, 2006; Zhu & Argo, 2013).

Although many findings have accumulated on embodied cognition (e.g., Jostmann, Lakens, & Schubert, 2009; Williams & Bargh, 2008), no studies have elucidated the effects of drawing circles or squares on social perceptions despite that drawing (moving hands) is a prototypical embodied process. In fact, it is well established that the movement of hands influences emotional processing in a metaphor-consistent manner. For example, regarding the up-down space, Casasanto and Dijkstra (2010) demonstrated that participants moving their hand from an upward to a downward position retrieved more positive memories, whereas those moving their hands in the opposite direction retrieved more negative memories. Likewise, Sasaki, Yamada, and Miura (2015) observed that participants that swiped a screen upward evaluated the visual images that were presented more positively whereas those that swiped it downward evaluated them more negatively. These studies have confirmed the effect of the conceptual metaphor "GOOD IS UP" and "BAD IS DOWN" (Lakoff & Johnson, 1980). The purpose of the current study was to investigate the influence of drawing circles or squares on impressions regarding the interpersonal environment. We hypothesized that a metaphor-consistent effect would occur as for the shape and social perception of personality: round cues facilitate judgments of warmth and square cues facilitate judgments of competence and rigorousness.

In addition to verifying the above hypotheses, we also explored if there is a direct or an indirect relationship between drawing squares and perceived competence and rigorousness. We exploratorily examined that the relationship between drawing squares and perceived rigorousness is mediated by the perception of competence, or the relationship between drawing squares and perceived competence is mediated by the perception of rigorousness, or there are no mediational processes, but two direct relationships.

Method

Ethics Statement

The study was approved by the Academic Committee of the Department of Social Psychology at Otemon Gakuin University. Participants in the study were informed that they could drop out of the study at any time during the survey. The informed consent of the participants was obtained before they took part in the study.

Participants

Participants were undergraduate university students (N = 95, 47 men and 48 women; aged 19 to 24 years, M_{Age} = 20.05, SD = 1.06). Participants received partial course credits for taking part in the study.

Stimuli and Design

A picture of a circle or a square drawn on a white sheet of paper as the independent variable, and a questionnaire inquiring about impressions regarding the interpersonal environment of the participants as the dependent variable, were used. A one-way ANOVAs (between-participants design) analyzed differences between the two conditions.

Procedure

Participants were randomly assigned to round (N = 47) or square (N = 48) conditions. Then, they received the questionnaire and were asked to complete it during a lecture. A picture of a circle or a square drawn on a white sheet of paper was also given to the participants. Then, the participants were asked to individually draw as many circles or squares as possible inside the circle or the square for 30 seconds. Following this, the participants responded to the questionnaire on impressions regarding their interpersonal environment. The questionnaire consisted of 12 items based on Okamura and Ura (2017), which assessed friendliness, likability, warmth, cooperativeness, competence, intelligence, successfulness, trustworthiness, rigorousness, diligence, uncompromisingness, and inflexibility (e.g., “How many warm people do you think there are around you?”). The presentation order of the 12 items was randomized by presenting the materials in a block-wise manner. All items were rated on a 7-point Likert scale ranging between 1 (*None*) and 7 (*Many*).

Results

We conducted an exploratory factor analysis of responses to the 12 items using maximum likelihood estimation and Promax rotation. According to our theoretical perspective, the factor structure was assumed to consist of three dimensions, warmth, competence, and rigorousness. The results indicated a good fit to the data ($\chi^2(33)$ = 58.16, p = .004, CFI = .948, RMSEA = .098, AIC = 128.721). The three dimensions that were identified were interpreted as competence (α = .88), rigorousness (α = .85), and warmth (α = .89). Of the 12 items in the scale, competence was assessed by 6 items (intelligence, successfulness, trustworthiness, competence, diligence, and uncompromisingness), warmth was assessed by 4 items (friendliness, likability, warmth, and cooperativeness), and rigorousness was assessed by 2 items (inflexibility and rigorousness). There were inter-factor correlation between rigorousness and competence (r = .41), rigorousness and warmth (r = -.20), and warmth and

competence (r = -.26). Then, we conducted a one-way analysis of variance (ANOVAs) to examine significant differences in judgments of impressions regarding the participants' interpersonal environment. The mean values and standard errors for judgments of impressions are presented in Table 1.

Table 1

Descriptive Statistics and Results of ANOVAs

	Round		Square				
Dimension	***M***	***SE***	***M***	***SE***	***F*(1, 93)**	***p***	η_p^2
Warmth	5.36	.17	4.68	.17	7.66	.01	.08
Competence	4.40	.15	5.14	.14	13.14	< .001	.12
Rigorousness	3.86	.20	4.44	.19	4.37	.04	.05

To test whether there is a direct or indirect relationship between square shape and perceived competence and rigorousness, a statistical mediation analysis (MacKinnon, 2008) was performed. In the analysis, we categorized and numbered the square shape as 1 and round shape as 2. The results of the mediation analysis considering competence as the mediator showed that rigorousness was found to be significantly related to square shape (β = -.21, t = -2.09, p = .039) and competence (β = .36, t = 3.54, p = .001). Perceived competence also related to square shape (β = -.35, t = -3.62, p < .001). However, when controlling perceived competence, square shape did not relate to perceived rigorousness (β = -.08, t = -.83, p = .41), suggesting that the relation between the independent variable (square shape) and the dependent variable (perceived rigorousness) was mediated by the perceived competence. This mediating effect was not found when perceived rigorousness was as the mediator. When controlling perceived rigorousness, square shape remained related to perceived competence (β = -.28, t = -3.01, p = .003).

Discussion

The results indicated that drawing circles or squares influenced impressions regarding the interpersonal environment in a metaphor-consistent manner. Participants in the round condition responded that there were significantly more warm people around them than those in the square condition. Moreover, participants in the square condition responded that there were significantly more competent and rigorous people around them than those in the round condition. These results are consistent with previous findings and provide evidence that round is associated with the warmth trait and square with competence and rigorousness trait.

The results of the mediation analysis indicated the possibility that the effect of drawing squares on perceived rigorousness was mediated by the perception of competence. Previous studies have reported that concrete and abstract concepts are associated in conceptual metaphors, and the activation of concrete or abstract concepts lead to activating the other related concept in a metaphor-consistent effect (Landau et al., 2010). We speculated that squares would directly influence the perception of competence in a metaphor-consistent manner and that perception of competence would influence the perception of rigorousness. The results indicated an association between these abstract concepts (competence and rigorousness). Various studies on metaphors have examined associations between concrete and abstract concepts and vice versa using metaphoric transfer strat-

egies (e.g., Lee & Schwarz, 2012). However, this is the first study demonstrating an association between abstract concepts, making this an especially important finding.

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Competing Interests

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