

Japanese Psychological Research (in press)

Does mere exposure enhance positive evaluation, independent of stimulus recognition?

A replication study in Japan and the US

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I thank Shinobu Kitayama and Jose A. Reyes for their help in conducting this research. I also thank Mark H. B. Radford for providing useful comments. Correspondence should be addressed to Keiko Ishii, Department of Behavioral Science, Faculty of Letters, Hokkaido University, N10W7, Kita-ku, Sapporo 060-0810 Japan. E-mail: ishii@let.hokudai.ac.jp

Abstract

In order to examine whether the mere exposure effect, the finding that exposure to a stimulus enhances a positive evaluation of it, occurs in Japan as well as in the US, a test was carried out using a novel auditory stimulus. Japanese and Americans were asked to listen to repeatedly presented Tagalog (the native Filipino language) utterances. They were then asked to estimate their liking for each utterance and whether they recognized it as one presented during the first exposure stage. The mere exposure effect was found in both cultures. Further, it resulted from only exposure frequency, not recognition. Implications for preference and the role of culture are discussed.

Keywords: preference, mere exposure, auditory stimulus, culture

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People sometimes experience the feeling that repeated exposure to something new makes them feel positively towards that object. Further, people tend to like something that is familiar. For instance, if a person sees an advertisement several times that simply says “vote for John”, the person may be more likely to evaluate John as a nice person even though there is no objective reason to do so. Such daily experience implies that our perception, even if it is an unconscious process, can affect our behavior and preferences.

Since Zajonc (1968), many empirical studies have noted the ‘mere exposure effect’, or the phenomenon that exposure to an object enhances its positive evaluation (see Bornstein, 1989, for review). Furthermore, it has been demonstrated that the ‘mere exposure effect’ occurs even when people do not recognize that they have been exposed to a stimulus. For example, in Moreland and Zajonc’s study (1977, experiment 2), respondents were presented with slides of Japanese ideographs at five frequencies (0, 1, 3, 9, 27), followed by the need to make a judgment for each of them in terms of degree of liking and recognition. Results showed enhancement of both liking and recognition with increasing stimulus exposure. However, in an overall regression analysis, in which frequency of exposure and recognition served as predictors of liking, significant partial correlations with liking were found for frequency of exposure, but not for recognition. This suggests that stimulus recognition is not necessary for the enhancement of liking, but that mere exposure to stimuli is sufficient.

That stimuli recognition is not necessary for the occurrence of exposure effects has been also suggested by a series of experiments, in which the stimulus was subliminally presented during the first exposure sequence (e.g., Kunst-Wilson & Zajonc,

1980; Marphy & Zajonc, 1993; Winkielman, Zajonc, & Schwarz, 1997). Kunst-Wilson and Zajonc (1980) briefly showed respondents half a set of irregular octagons. Then, comparing octagons that had been presented during the exposure phase (i.e., old stimulus) with octagons that had never been presented (i.e., new stimulus), respondents were asked to indicate which ones they liked better and which ones they thought they had been shown previously. They found that participants tended to choose the old stimulus over the new one in preference judgments, although recognition accuracy was at chance level.

While a number of studies have found the mere exposure effect when using visual stimuli (e.g., photograph and octagon), few studies have used auditory stimuli (including musical stimuli) to examine the effect (Brentar, Neuendorf, & Armstrong, 1994; Szpunar, Schellenberg, & Pliner, 2004; Wilson, 1979). One exception is a study by Wilson (1979). By adopting a modified dichotic-listening procedure, Wilson examined whether stimuli presented on the unattended channel would be rated more positively than those not presented at all, even though such stimuli may not be correctly recognized. In the study, participants were first asked to search for grammatical mistakes in the taped distracter message played to their left ear. During this task, the target tone sequences stimuli were played to their right ear, which was the 'unattended side'. Participants were then presented with a set of tone sequences including the target stimuli and were asked to make a judgment for liking and recognition. As predicted, participants preferred the target tone sequences to ones which had not appeared during the first step, although they found it difficult to recognize which had been the original target sequences. Recent findings in musical research have shown that when people listen to music incidentally, they are likely to rate more positively music heard more frequently in the exposure phase than music they have never heard (Szpunar et al., 2004).

Mere exposure effect and culture

For the past decade, cultural psychologists have found culturally divergent patterns on cognition and emotion (e.g., Ishii, Reyes, & Kitayama, 2003; Kitayama, Markus, & Kurokawa, 2000; Nisbett, Peng, Choi, & Norenzayan, 2001). For instance, Ishii et al (2003) suggested culturally divergent forms of attention, based on daily communication practices (e.g., high- vs. low-context communication, Hall, 1976). Ishii et al's study demonstrated that in the processing of emotional utterances, Japanese and Filipinos are more likely to attend to paralinguistic cues (e.g., vocal tone), reflecting a high-context communication strategy, while Americans are more likely to attend to verbal meaning reflecting a low-context communication strategy. In line with these findings, the question can be asked - are there any cross-cultural differences in the mere exposure effect?

According to Zajonc (2001), the process whereby repeated mere exposure leads to preference is so primitive that it is not accompanied by cognitive mediation (i.e., recognition). Therefore, in the course of the mere exposure effect there should be no room for influence by certain aspects of culture. Consistent with this suggestion, cultural differences between East and West have been mainly reported in cognitive activity, such as attention, reasoning, and categorization (cf., Nisbett et al., 2001) but there is no research that refers to cultural differences in the pre-attentional stage. It is still unclear whether there are any cultural differences in the mere exposure effect, as little research in East Asian cultures (e.g., Japan) has examined whether the mere exposure effect appears independently of recognition, regardless of modality of stimulus (see Inomata, 1983; Morinaga & Matsumura, 1987). Moreover, there is no research that attempts to directly compare patterns of the mere exposure effect between cultures.

The purpose of this study was to examine whether the mere exposure effect is

found in two cultures (Japan and the US), using novel auditory stimulus (e.g., utterance in Tagalog), and whether recognition is related to the presence of this effect. Based on Zajonc's argument it is expected that the mere exposure effect would be found in Japanese subjects as well as American subjects. That is, for both Japanese and Americans increasing stimulus exposure would enhance both liking and recognition, but recognition would not predict liking.

Method

Respondents and procedure

Twenty-two undergraduates at Kyoto University and 21 undergraduates at the University of Chicago participated in this experiment. They had never consciously heard any utterances in Tagalog. Each respondent was seated in front of a personal computer and asked to wear a pair of headphones. The experiment consisted of two phases: exposure and rating. During the exposure phase, the respondents were instructed to listen to a series of utterances for three minutes (in this phase, participants were not informed about the next phase). The stimuli were fifteen utterances in Tagalog, consisting of three sets to which five utterances were randomly assigned (see Materials). A total of 50 exposure trials were prepared by counterbalancing three sets with three frequencies (0, 2, 8). After the exposure phase, respondents were asked to listen to the fifteen utterances in Tagalog and to make a judgment to what extent they like the utterance on a 7-point scale (1=dislike very much, 7=like very much). They were then asked to listen to the same set of fifteen utterances and to rate their confidence that it had or had not been presented during the exposure phase on a 7-point scale (1=very sure not presented, 7=very sure presented).

Materials

Fifteen words in Tagalog, which are not phonemically similar to any Japanese

and English words, were selected. These words are listed in Table 1. They were either positive, neutral, or negative in word meaning. The words were read in a business-like tone by a male native Tagalog speaker. An analysis of variance (ANOVA) with three variables (culture, exposure frequency, and word meaning) conducted on the rating for the liking judgment did not show any effects, including a main effect for word meaning ($F_s < 1$). Thus, the evaluation of meaning did not influence ratings for the liking judgment in this study.

Results

Relevant means were computed separately for each respondent. Because the preliminary analysis showed no effect of word meaning on rating for the liking judgment (see Materials), the variable of word meaning was not included in the analysis reported below. First, an ANOVA with culture (Japan and the US) and exposure frequency (0, 2 and 8) was conducted on rating for the liking judgment. The main effect of culture proved to be significant, $F(1, 41) = 9.55, p < .005$. Americans were more likely than Japanese to positively rate each utterance ($M = 4.47$ vs. 3.89). The main effect of exposure frequency was also significant, $F(2, 82) = 20.23, MSe = 0.55, p < .0001$. The results are summarized in Table 2. Tukey's HSD test showed that both utterances repeatedly presented eight times ($M = 4.60$) and those presented twice ($M = 4.30$) were liked significantly better than ones never presented ($M = 3.61$), $p_s < .01$. In addition, it also showed that utterances presented eight times were liked somewhat better than those presented only twice, $p < .10$. A significant interaction between culture and exposure frequency, however, was not found ($F < 1$). Therefore, culture did not influence the pattern of increasing of liking, corresponding to exposure frequency.¹

Second, an ANOVA with culture (2) and exposure frequency (3) was also conducted on ratings for the recognition judgment. A significant main effect of exposure

frequency was found, $F(2, 82) = 195.80$, $MSe = 0.53$, $p < .0001$. The results are summarized in Table 2. Tukey's HSD test showed that both utterances presented eight times ($M = 6.48$) and twice ($M = 5.55$) in the expose phase were judged with significantly more certainty than those which had not been previously presented ($M = 3.43$), $ps < .01$. Moreover, it also showed that utterances presented eight times were judged more confidently than utterances presented only twice, $p < .01$. The interaction between culture and exposure frequency, again, was not significant ($F(2, 82) = 1.85$, ns). As in the liking judgment, there was no cultural difference in the pattern of recognition.ⁱⁱ

The relationships among exposure frequency, liking rating, and recognition rating were further examined. By adopting the procedure used by Moreland and Zajonc (1977), the raw exposure frequencies were first transformed, $f' = \log(f+1)$, $f = 0, 2, 8$. In both cultures significant correlations with liking were found for both exposure frequency and recognition (in Japan, $rs = .47$ and $.36$, $ps < .01$; in the US, $rs = .40$ and $.42$, $ps < .01$). Next, a multiple regression analysis was conducted in which exposure frequency, recognition, culture (a dummy variableⁱⁱⁱ), and exposure frequency x culture interaction served as predictors of liking. This showed that the overall regression was significant ($F(4, 124) = 10.79$, $p < .0001$, $R^2 = .26$). The rate of the coefficient of multiple determination (R^2) was somewhat low however, so that other variables (e.g., subjective familiarity) not considered in the current study may have had an effect on liking. This point is discussed below. Liking for utterances was predicted by exposure frequency and culture (Beta coefficient = $.35$ and $-.27$, $ps < .05$). In the effect of exposure frequency however, there was no cultural difference (the exposure frequency x culture beta coefficient = $-.04$, ns). Importantly, the results did not show an effect of stimulus recognition on liking (the recognition beta coefficient = $.09$, ns). This suggests that the exposure effect results from exposure frequency, and that is not dependent on stimulus

recognition^{iv}. In addition, there was no cross-cultural difference in such exposure effects.

Discussion

The research presented here shows that when using novel auditory stimuli the mere exposure effect occurs not only in the US, but also in Japan. Both Japanese and Americans preferred stimuli repeated in an exposure phase to those which had never been presented. Moreover they correctly recognized the repeated stimuli as ones presented in the exposure phase. In line with previous studies (e.g., Moreland & Zajonc, 1977), the mere exposure effect occurs independently of stimulus recognition. This would suggest that the current study successfully replicated the previous results on the mere exposure effect, obtained mainly in the US, in a different culture (i.e., Japan).

The lower R^2 rate in the multiple regression suggests that although the exposure frequency, not stimulus recognition, seemed to have impact on the occurrence of the mere exposure effect, it still needs to be confirmed whether this finding will be replicated even when other independent variables (e.g., subjective familiarity for each utterance) are included in the analysis. Based on findings of Moreland & Zajonc (1977), subjective familiarity, as well as exposure frequency, can influence the occurrence of the effect.

Although not discussed, results of this study showed while there is no cultural difference in the pattern of the mere exposure effect, there was a cultural difference in the degree of preference judgment. It is possible that this difference is related to subjective familiarity on the part of US subjects to the utterances. In the Philippines, Spanish has had an important influence on the language. Likewise in the US Spanish, while not necessary understood, is a familiar 'utterance'. This shared linguistic influence may explain the difference in degree found.

Recent research on the mere exposure effect has demonstrated that positive affect which was enhanced by subliminally repeatedly presented polygons was generated

in response to new polygons which are similar to the presented stimuli in shape and substance (Monahan, Murphy, & Zajonc, 2000). In addition, preference, which was increased by exposed face photographs, was also generated in response to the average composites of those faces which had never been presented (Rhodes, Halberstadt, & Brajkovich, 2000). Future research should examine whether such generation of preferences would be also found for auditory stimuli such as the utterances used in the present study.

The results from this study add to the growing literature of cognition and emotion research from a cultural psychological perspective. Evidence in cultural psychology has suggested that the human psyche, which includes cognitive systems and emotion, is influenced by cultural meanings, norms, institutions, and the daily practices of the local culture. Interestingly, the present results would raise questions about to what extent cultural practices and meanings become part of psychological processes. Findings in the current study imply that there would be less cultural differences in the pre-attentional stage, where cognitive activity does not matter. Additional research, which aims at filling in the gap between previous findings in cultural psychology and the present study's suggestion that preference for an object would be led by mere exposure regardless of culture, is needed to clarify the degree of cultural influence on psychological processes.

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Footnote

ⁱ A trend analysis was also conducted for each culture and showed that in both cultures the increase of exposure frequency associated with the increase in degree of liking rating (US: $F(1, 20) = 13.28, p < .01$; Japan: $F(1, 21) = 35.67, p < .01$).

ⁱⁱ A trend analysis showed that in both cultures the increase of exposure frequency associated with the increase in degree of recognition (US: $F(1, 20) = 124.03, p < .01$; Japan: $F(1, 21) = 284.69, p < .01$).

ⁱⁱⁱ Culture was coded as 0 = US and 1 = Japan.

^{iv} In order to confirm that liking, which results from exposure frequency, is not dependent on recognition, split correlations between liking and recognition for each frequency was computed. The results showed that no significant correlations were observed ($r = -.01$, when frequency is 0; $r = -.02$, when frequency is 2; $r = .21$, when frequency is 8).

Table 1. Tagalog words (with English equivalents) used in the study.

Amoy	(Smell)
Bago	(New)
Hangarin	(Purpose)
Inaantok	(Sleepy)
Kasinungalingan	(Lie)
Kislap	(Sparkle)
Lagnat	(Fever)
Lugar	(Location)
Maingay	(Noisy)
Makapal	(Injury)
Mayabang	(Vain)
Nakakatakot	(Scary)
Pagitan	(Midway)
Pagkakataon	(Chance)
Pagsisikap	(Effort)

Table 2. Mean ratings for liking and recognition of Tagalog stimuli.

Culture	Exposure frequency					
	0		2		8	
	Japan	US	Japan	US	Japan	US
Judgment						
Liking	3.36	3.88	3.98	4.64	4.32	4.90
	(0.66)	(0.98)	(0.72)	(0.87)	(0.82)	(1.08)
Recognition	3.23	3.64	5.59	5.51	6.55	6.41
	(0.83)	(0.97)	(0.91)	(0.85)	(0.49)	(0.41)

Note. Standard deviations are given in parentheses. Liking for each stimulus was rated on a scale from 1 (dislike very much) to 7 (like very much). Recognition for each stimulus was rated on a scale from 1 (very sure not presented) to 7 (very sure presented).