

Reversed Facial Images and the Mere-Exposure Hypothesis

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The mere-exposure hypothesis was tested in a new context in which the plausibility of a demand-characteristics explanation was minimized. It was assumed that Person has more frequently been exposed to her mirror image than true image, whereas Person's Friend or Lover has more frequently been exposed to Person's true image than mirror image. According to the mere-exposure hypothesis, Person should prefer her mirror image, whereas her Friend or Lover should prefer Person's true image. A single frontal facial photograph of Person was printed in such a way that one print corresponded to Person's true image and another to her mirror image. In two studies, Person was found reliably to prefer her mirror image over her true image, whereas the reverse tendency characterized preferences of Person's Friend or Lover.

The "mere-exposure" hypothesis (Zajonc, 1968), that the mere repeated exposure of an individual to a stimulus is a sufficient condition for the enhancement of stimulus evaluation, has been studied extensively. In the basic within-participants design, individuals initially view unfamiliar stimuli, such as nonsense words, ideographs, or facial photographs, a varying number of times and subsequently rate these materials along either good/bad or like/dislike dimensions. Typically, the stimuli that are seen more frequently receive more favorable evaluations, in accord with the exposure hypothesis.

A serious problem in nearly all of the studies involving the experimental manipulation of exposure frequency has been that of demand characteristics (Saegert, Swap, & Zajonc, 1973; Stang, 1974). Stang (1974) reported that participants' affective ratings of stimuli increased even when they simply imagined having seen them more frequently

than other stimuli, suggesting that participants' intuition could possibly account for the exposure-affect relationship found in the other studies. Stang suggested that the variables investigated be more carefully embedded in plausible cover stories and, at the very least, that postexperimental inquiries regarding demand characteristics be made. Moreland and Zajonc (1976) recently addressed the demand issue in a study in which exposure frequency was a between-participants manipulation. Participants appeared to have been unaware of the experimental hypothesis as revealed by postexperimental inquiries, and the mere-exposure hypothesis was corroborated.

Our intent in the present study was to test the mere-exposure hypothesis so that there was virtually no possibility of sensitizing participants to the frequency-affect hypothesis. Thus, like Moreland and Zajonc (1976) we wished to render demand explanations implausible. Unlike these investigators, however, we chose to utilize an entirely new paradigm to probe the generality of mere-exposure effects.

We assumed that individuals are more likely to be exposed repeatedly to their mirror facial image than to their true facial image. We therefore reasoned that if the mere-exposure hypothesis is true, individuals will prefer a facial photograph that corresponds to their mirror image rather than to

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Table 1
*Preferences of Targets and Friends for True
 and Mirror Prints (Study 1)*

Friend's preference	Target's preference		Row total
	True print	Mirror print	
True print	5	15	20
Mirror print	7	6	13
Column total	12	21	33

their true image. Analogously, we reasoned that a close friend would have been exposed more often to the true than to the mirror image and would therefore prefer a photograph that corresponds to the true image. Our methodology simply involved photographing individuals, printing mirror and true images, and assessing the preferences of the photographic subjects and their close friends for the two prints.

Study 1

Method

Participants. Thirty-seven women enrolled in undergraduate psychology courses at the University of Wisconsin—Milwaukee earned experimental credit for participation in a “self-perception” study and were designated *targets*. These women were each asked to bring a “close female friend living in the Milwaukee area” to the study, and the women in this latter group were designated *friends*. Four targets did not comply with this request; thus 33 dyads were studied

Procedure. In the first session, each target sat for two frontal facial exposures. Only one of the negatives was printed so that the two resulting (25 × 20 cm, black and white, glossy) photographs were mirror images of each other. The print corresponding to how the target appears to herself when looking in the mirror was designated the *mirror print*; the remaining print, corresponding to how she generally appears to others, was designated the *true print*.

Target and friend arrived together for the second session but were tested individually. The target was tested first, while her friend waited in another room, and then the situation was immediately reversed to minimize dyadic communication.

Participants were seated in a well-lit room at a table upon which the photographs were displayed. Left and right positioning of the photographs was randomized for each participant, who was asked to view both photographs and to indicate which photo-

graph she “like(d) better.” The experimenter did not explain what was meant by the phrase, “like better,” but merely repeated the instruction if elaboration was requested. In the event a participant felt that the photographs were equally likeable, she was asked to express a preference even though it might reflect a minute difference.

After the participant had responded, she was asked to state her reasons for making her choice in order to ascertain how well she had understood the instructions and to assess demand characteristics. She was then asked what she thought the purpose of the experiment was. All responses were recorded by the experimenter. Participants were not informed about the purpose of the study until the preferences of all dyads had been assessed.

Results and Discussion

The joint prediction that targets would prefer the mirror print and friends would favor the true print was confirmed. As depicted in Table 1, 15 of the 33 (.45) dyads performed in this fashion ($p < .01$, binomial [33, 1/4]).¹ The column and row marginals reflect, respectively, targets' and friends' individual preferences for the two prints. Although the proportion of targets preferring the mirror print was .64 (21 of 33), this statistic did not differ from chance at conventional levels of significance ($p < .08$, binomial [33, 1/2]). When, however, the data of the 4 targets who did not bring friends were added, the proportion of times the mirror print was preferred rose to .68 and reliably differed from chance ($p < .02$, binomial [37, 1/2]). Although the proportion of friends preferring the true print was .61 (20/33), in the predicted direction, this statistic did not differ from chance ($p < .15$, binomial [33, 1/2]).

While these results were encouraging, we thought it best to replicate the study, given the novelty of the paradigm. In particular, the friend's preference appeared weaker, and we sought a more powerful testing procedure. We therefore revised our procedure in two ways. First, we reasoned that if any individual spends a great deal of time viewing a woman's face, it is her lover. Therefore, we

¹ All p values are one-tailed. For this binomial test there were 33 participant pairs, and the probability of “success” was 1/4. In this case, success was the target's preferring her mirror print and the friend's preferring the true print.

recruited only women who believed they were dating individuals who were in love with them. Secondly, in order better to assess preferences, we asked participants to choose which of the two prints they preferred over a series of five trials. Finally, it should be noted that in Study 1 the experimenter knew which photographs were the mirror prints. In order to reduce the possibility of experimenter bias in the replication, the experimenter was not told which were the mirror prints.

Study 2

Method

Participants. Thirty-eight women enrolled in summer session courses at the University of Wisconsin—Milwaukee, each of whom had indicated that she was dating or living with a person who she believed was in love with her, were designated *targets*. As before, they were invited to participate in a “self-perception” study and were asked to bring their lovers—who were men—to the second session. Ten targets did not comply with the latter request, primarily because their lovers were out of town.

Procedure. In the first session, each target sat for three frontal facial exposures. As before, only one of the negatives was printed to generate a mirror and a true print.

The testing procedure was essentially identical to that used in Study 1, with the exception that the two prints were presented for judgment over five trials. Participants were asked to turn away from the viewing table while the next photographs were being displayed. The same two prints were, of course, presented across trials with left and right positioning randomized.

After the five trials had been completed, participants were interviewed as in the first study, with their responses (in this study) tape recorded. Participants were again not informed about the purpose of the study until all dyads had been tested.

Table 2
Preferences of Targets and Lovers for True and Mirror Prints on First Trial (Study 2)

Lover's preference	Target's preference		Row total
	True print	Mirror print	
True print	5	12	17
Mirror print	3	8	11
Column total	8	20	28

Table 3
Modal Preferences (Across Five Trials) of Targets and Lovers for True and Mirror Prints (Study 2)

Lover's preference	Target's preference		Row total
	True print	Mirror print	
True print	5	14	19
Mirror print	3	6	9
Column total	8	20	28

Results and Discussion

Participants' responses on the first trial constitute a nearly exact replication of the first study. Furthermore, less than 45 seconds usually elapsed (in both studies) between the time at which a participant received instructions and the time at which she indicated her first preference. This duration would hardly seem adequate for a participant to formulate the experimental hypothesis and devise an appropriate response, as per a demand interpretation. Preferences observed on the first trial are, therefore, of considerable interest.

The responses for the first trial, for the 28 women who brought a lover to the second session, are presented in Table 2. The joint prediction was again corroborated for 12 of the 28 (.43) dyads ($p < .025$, binomial [28, 1/4]). Of the 28 targets represented in Table 2, 20 (.71) preferred the mirror to the true print ($p < .02$, binomial [28, 1/2]). This preference was diminished somewhat, 26 of 38 (.68), when the preferences of the 10 women who did not bring their lovers were included ($p < .018$, binomial [38, 1/2]). Although 17 of the 28 lovers (.61) preferred the true print, this preference was not reliable ($p < .17$, binomial [28, 1/2]).

In summary, the pattern of results for preferences on the first trial appears virtually identical to that observed in the first study. The joint and target preference predictions were reliably corroborated, whereas only a tendency consistent with the exposure hypothesis was noted for the friend/lover prediction.

Modal preferences across the entire five-trial sequence are presented in Table 3. Once again, the joint prediction that the target would prefer the mirror print and her lover would favor the true print was strongly confirmed. As indicated in Table 3, 14 of the 28 dyads (.50) performed in this fashion ($p < .003$, binomial [28, 1/4]). As is evident from the marginals, the proportion of targets who preferred the mirror print was .71 (20 of 28), which is significant ($p < .02$, binomial [28, 1/2]). This preference is diminished slightly, .68 (26 of 38), but is reliable ($p < .02$, binomial [38, 1/2]), when the data of the 10 targets who could not bring their lovers are included. Finally, as is illustrated in Table 3, 19 of the 28 (.68) lovers reliably preferred the true print ($p < .04$, binomial [28, 1/2]). It would appear that the multiple assessment procedure is the basis for our finally detecting a reliable lover-preference effect.

The overall pattern of findings across the two studies is consistent with the mere-exposure hypothesis. Furthermore, it is important to indicate that there appears to be virtually no evidence for a demand interpretation. As noted, a demand explanation appears particularly implausible for initial preferences. Although participants had as much as 2 weeks after they were photographed to think about the study, it appears unlikely that they or their friends could divine the experimental hypothesis on the basis of the photographic session.

In attempting to assess demand after preferences had been collected, we first asked participants to indicate the basis for their selections. In the first study, for example, participants mentioned "more natural," "better head tilt," "better facial angle," "better eyes," "longer hair," "straighter part," "snicker," and "looks less mean." It almost appears that participants were sometimes inventing differences, because the prints were made from the same negative. At any rate, it does not appear that anyone came at all close to the experimental hypothesis on the basis of the initial inquiry in either study.

We were then more direct and asked participants to state the purpose of the experiment. In the first study, nine participants

said that the study was set up to compare how they perceive themselves with how their friends perceive them. Forty participants said that they did not know (this may have been due to other demand characteristics, or it may have indicated that the hypothesis was not blatantly apparent). Two of the friends said "visual perception." Two of the targets said "self-perception," which, of course, was the description we provided. Two participants said "comparing self-perception with the way the pictures are." Perhaps if the participants had been required to generate formal hypotheses, it would be clearer to what extent they truly did not know what the study was about and to what extent they were simply uninterested in what was going on. Again, none of the participants in the first study seemed to know what the study was about.

In the second study, two participants noticed that the photographs were reversals of each other, but again none expressed knowledge that a particular photograph was hypothesized to be preferred. It would have been, of course, interesting to ask participants which photographs corresponded to their mirror images, but we were afraid that participants would convey this information to other participants and explicitly sensitize them to the experimental hypothesis.

Nearly a decade has elapsed since Zajonc (1968) published his monograph and rekindled interest in the exposure hypothesis. Numerous processes have been hypothesized to mediate the exposure-affect relationship. Except for the experimental-demand hypothesis, the present paradigm does not permit an assessment of the validity of other explanations, such as classical conditioning, instrumental conditioning, or response competition. The main reasons for considering the results of this study as support for the mere-exposure hypothesis are (a) that the mirror and true facial photographs are almost indistinguishable, as evidenced by the participants' inability to state cogent reasons for their preferences (the difference between them is just barely accessible to the participants' consciousness), and (b) that frequency of exposure is the primary dimension along which they differ. In summary, the covariations that

we predicted on the basis of the mere-exposure hypothesis were confirmed and do not appear consistent with a demand-characteristics interpretation.

References

- Moreland, R. L., & Zajonc, R. B. A strong test of exposure effects. *Journal of Experimental Social Psychology*, 1976, 12, 170-179
- Saegert, S., Swap, W., & Zajonc, R. B. Exposure, context, and interpersonal attraction. *Journal of Personality and Social Psychology*, 1973, 25, 234-242
- Stang, D. J. Intuition as artifact in mere exposure studies. *Journal of Personality and Social Psychology*, 1974, 30, 647-653.
- Zajonc, R. B. Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology Monograph* 1968, 9 (2, Pt. 2).

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