Psychol. Belg.
1977, XVII-1, 59-70.

Katholieke Universiteit te Leuven

GUESSING VERSUS JUDGING AFTER MERE REPEATED EXPOSURE[1]

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This study examines the hypothesis that response competition by itself is not a sufficient condition to obtain the mere exposure effect. Response competition is only one determinant of conflict. It must be made psychologically relevant in order to obtain the predicted mere exposure effects. In an attempt to manipulate this importance factor experimentally, subjects were either asked to guess or to judge the meaning of the stimuli. ss' liking of the stimuli was not influenced by frequency of exposure when they were asked to guess. When they were asked to judge the meaning and when it was stressed that they should try to be as correct as possible, liking increased with increasing exposure ($p < .05$) but the frequency – affect relationship was clearly *U*-shaped. Exploration decreased significantly in all conditions but a Frequency x Importance interaction ($p < .05$) was also obtained.

Zajonc (1968) presented evidence demonstrating that increased exposure to a novel stimulus constitutes a sufficient condition for the enhancement of the favorability of affective ratings toward that stimulus. Harrison (1968) interpreted this repeated exposure effect in terms of response competition. A novel stimulus poses a problem for the perceiver. Because he has had little or no experience with such a low probability stimulus, no specific responses are associated with it. On the other hand, every novel stimulus also shares some similarities with other stimuli encountered in the past. By a process of stimulus generalisation, a number of possible responses are activated. To the extent that they are incompatible response competition results. The latter is assumed to have aversive (tension) properties. Repeated exposure of the initially novel stimulus results in the dominance of certain responses and the attenuation of others. In other words, response competition gets reduced. The mere exposure effect, i.e. an enhancement of the favorability of the individual's affective ratings, is then an empirical consequence of this reduction. At the same time the likelihood that the stimulus elicits exploratory behavior decreases. Several experiments (Harrison, 1968; Harrison & Zajonc, 1970; Matlin, 1970 & 1971) confirmed this interpretation.

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[1] The experiments reported here were conducted at the "Laboratorium voor Experimentele Sociale Psychologie" te Leuven while the author was an "Aspirant van het Belgisch Nationaal Fonds voor Wetenschappelijk Onderzoek." This article is based on a section of the author's doctoral dissertation which he is preparing under the supervision of J. M. Nuttin Jr. The author is indebted to J. M. Nuttin Jr, E. Van Avermaet, and J. Hatcher for their critical comments on earlier drafts of this article.

A series of experiments conducted by Vanbeselaere (1974) failed to replicate this earlier findings however. Only the exploration times were influenced by the frequency manipulation, but even these data did not follow the predicted and previously observed pattern.

Although the experimental stituations were copied as literally as possible from the studies (Brickman et al., 1972; Zajonc, 1968) that resulted in a clear confirmation of the response competition hypothesis, the repeated exposure manipulation did not affect the affective ratings. Perhaps the stimuli did not evoke response competition, but this is unlikely since the stimuli [2] used meet all the requirements of Harrison's hypothesis. It is possible however that for some reason response competition was not strong enough as to have a clear effect on the affective ratings. In an attempt to explore this possibility, the repeated exposure situation was analysed in terms of Berlyne's theory on novelty and conflict.

Berlyne (1960) hypothesizes that novel stimuli will arouse response competition. If the subject experiences response competition in a situation which is psychologically important, then he will experience conflict. This conflict will increase with: a. the number of competing response tendencies, b. the relative strength of the competing response tendencies, and c. the absolute strength of the competing response tendencies.

According to Berlyne, response competition would be determined by the number and by the relative strength of the competing response tendencies. The absolute strength of the competing response tendencies would have no influence on the amount of response competition but it is an important determinant of the amount of conflict. Berlyne (1963) assumes also that the psychological importance of the situation increases the conflict by strengthening all competing response tendencies. Berlyne's theory can be written in the following formula: Conflict = Response competition x Importance. It is clear from this formula for conflict that there can be quite a lot of response competition without much conflict if no strong response tendencies are involved, or if the whole situation is psychologically not so important for the subject.

This conflict hypothesis offers an explanation for the negative findings of Vanbeselaere (1974).

Zajonc's *Ss* were told that "their next task would be to guess what the words meant." The experimenter told the subject that he realized how nearly impossible this task was, and that he therefore did not require him to guess the word meanings exactly. Instead, it would suffice that the subject indicated on a good-bad scale whether each word meant something good or something bad and to what extent. These instructions, while stressing the fact that the assignment is diffi-

[2] The *Turkish* adjectives used in the experiments were: Wacviwpaj, Fompawgib, Fetwugwef, Jotmavfon, Jemhavbud, Rulkuwsim. They received an almost exactly neutral mean evaluation on a pre-test.

cult, still give a *task* orientation, and still imply that this task can be done well.

The Dutch translation, on the other hand, has a strong connotation of "it is impossible to know what the word means, so just give an answer." This connotation of pure guessing reduces the importance of the evaluation task. If it is impossible to know the right answer, the subject does not have to care about the answers he gives. On the other hand, since nonsense words are used, it is also to be expected that the activated response tendencies will be rather weak. Hence, in this reduced importance situation, conflict is absent and it is therefore not very surprising that the results were not in line with the predictions derived from Harrison's hypothesis. In other words, the literal translation of Zajonc's instructions in Dutch changed their meaning as well as the *Ss*' definition of the experimental situation.

A last point that must be considered relates to the multiplicative relation between response competition and importance in determining the degree of conflict. According to Berlyne, importance stands in a multiplicative relation to response competition, and consequently the effects of importance should be higher with higher levels of response competition. If exploration is a good index of conflict, and it seems to be (Lanzetta & Kanareff, 1962; Lanzetta & Driscoll, 1968), then one simply ought to find an interaction between response competition and importance. That is, for very low values of response competition, two importance conditions should not differ from each other, whereas for high values of response competition, the higher importance condition should result in much more exploration than the lower importance condition. This would mean for the exploration of the stimuli after the repeated exposure manipulation that the differences between the importance conditions would be most clearly observable at the lower frequencies of presentation. At higher frequencies, differences in importance would no longer have such a clear effect upon exploration. A partly different prediction should be made for the favorability of the affective ratings of the stimuli. If there is a lot of response competition, higher importance should cause a more intense conflict and hence more arousal. This means that in the low frequency conditions of the repeated exposure manipulation the higher importance condition should result in less favorable ratings. If arousal reduction is rewarding, then one would expect that this will be stronger the case after a higher amount of arousal. This would then be reflected in a more positive rating of the high frequency stimuli in the higher importance condition.

The evidence concerning the relation between response competition and importance is mixed however. Lanzetta & Driscoll (1968) found that response competition and importance combined additively in determining the amount of information search, whereas Heslin et al. (1972) found evidence favoring the hypothesis that there is a multiplicative relation.

Whether response competition and importance combine multiplicatively or additively is however not so important for the present analysis of the mere exposure phenomenon. It is only assumed that response competition by itself is not a sufficient condition to obtain the repeated exposure effect. It should be made relevant psychologically. The effect of the importance factor could easily be explained by the following mechanism. The importance could raise an individual's arousal already beyond the optimum level. In such a situation, a small further increase of arousal due to novelty, conflict, etc..., can raise the arousal far beyond the optimum level while it would otherwise only result in a quite comfortable amount of arousal which is not distressing at all.

The present experiment operationalizes the importance factor in terms of "task"-orientation. *Ss* will either have to guess or to judge the meaning of the stimulus words. In the first condition ("guess"-condition), Zajonc's instructions were translated literally. In the second one, the word "guess" was replaced by the word "judge". In a third condition they were also asked to judge the meaning of the stimulus words but it was stressed that they should try to be as correct as possible.

In each condition, *Ss* were given three tasks. First, they had to indicate whether each word meant something good or something bad. Second, they had to indicate whether they found each word beautiful or not. This rating was included to have a second measurement of the evaluative dimension. Finally, *Ss* could explore the stimuli as long as they wanted to do.

It was expected that the good-bad ratings would only be influenced by frequency of exposure in the judgment conditions but not in the guess condition. Moreover, the emphasis on the importance factor was expected to decrease the favorability of the affective reactions at the lower exposure frequencies but to increase the favorability at the high frequencies. A similar prediction was made for the beautiful – not beautiful ratings, since they too can be considered as an index of the same evaluative dimension. However, since this rating was not so strongly related to the *Ss*' task as the good-bad rating, the main purpose for including it was an exploratory one. As far as exploration is concerned, it was expected that the exploration times would decrease in all conditions as a function of frequency of exposure. In addition the emphasis on the importance factor was also expected to increase exploration times, especially at lower frequencies of exposure.

METHOD

SUBJECTS

Ss were 90 first year psychology students, who volunteered to participate. They were randomly divided over the three experimental conditions with an equal number of males and females in every condition.

STIMULI

Six nonsense words (see Footnote 2) were used as stimuli. They were written on 7.5×12.5 cm index cards. The six stimuli were counterbalanced against the six frequency conditions (0, 1, 2, 5, 10, and 25) in a 6×6 Latin square design. The same square was used throughout the whole study and it was replicated five times in every condition.

PROCEDURE

Stimulus presentation. *Ss*, who were run individually, were told that the experiment dealt with the processes involved in learning a foreign language. They were instructed to pay close attention to the words presented. They received a package of 43 cards on which the words were written. They had to look at each card for three seconds and then turn it over. *E* gave a signal every three seconds.

Rating phase. *Ss* were told that the words they had just seen were in fact Turkish adjectives which all meant something good or something bad. — In the Guess condition, *Ss* were explained that their next task would be to guess what the words meant. *E* told the subject that he realized how nearly impossible this task was, and that he therefore did not require him to guess the word meanings exactly. Instead, it would suffice that the subject indicated on a nine (0-8) point good-bad scale whether each word meant something good or something bad and to what extent. They were also asked to indicate on a nine point scale whether they found the word beautiful or not. — In the Judgment condition, *Ss* were told that their next task would be to judge what the words meant. They had to indicate their judgment about each word's meaning on nine point good-bad scales. They were also asked to indicate on a nine point scale whether they found the word beautiful or not. — In the Judgment + Importance condition, *Ss* were told that their next task would be to judge what the words meant. It was stressed that they should judge the meaning of each word on a nine point good-bad scale and that they should try to be as correct as possible. They were told that their judgments would be compared with the judgments given by people familiar with the Turkish language in order to determine how well their judgments corresponded to the true meanings of the words. Then they also had to indicate whether they found the words beautiful or not.

Exploration phase. The stimuli were shown once more and *Ss* were told that they could look at each of the words as long as they wanted to do. The exploration time for each stimulus was covertly recorded with a stopwatch.

Debriefing. The experimenter then explained very briefly the purposes of the study. After all *Ss* were run, a more detailed explanation was mailed to everybody who participated in the experiment.

RESULTS

Ratings were scored 0 - 8, with 8 indicating greatest goodness and most beautiful. An analysis of variance was performed for each condition separately. Since the importance factor was a between subject manipulation, the three conditions were also combined in one single analysis (Winer, 1962, p. 554-563). This procedure was used for all rating data and for exploration times.

GOOD-BAD JUDGMENTS

The results of the different conditions are presented in Figure 1. In the guess condition, frequency had no effect at all on the favorability

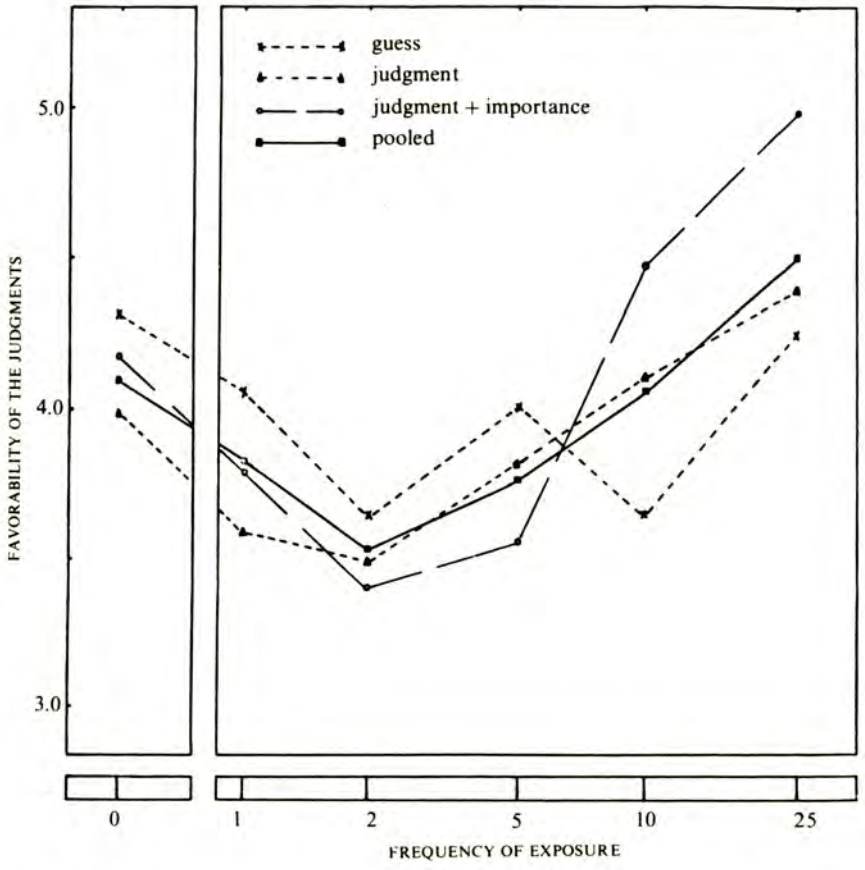

FIG. 1. FAVORABILITY OF THE JUDGMENTS AS A FUNCTION OF FREQUENCY OF EXPOSURE AND OF DIFFERENT IMPORTANCE CONDITIONS

of the ratings ($F < 1$). In the judgment condition, the effects of frequency were also not significant ($F = 1.19$, $df = 5/120$, N.S.). In the judment + importance condition, the effects of frequency were significant ($F = 2.84$, $df = 5/120$, $p < .05$). In this condition both linear and quadratic trend components were significant ($F = 4.22$, $df = 1/120$, $p < .05$, and $F = 8.99$, $df = 1/120$, $p < .01$ respectively). These two components account for 93% of the variance associated with the frequency manipulation, with the quadratic component accounting for 63%.

The importance factor had neither a main effect nor an interaction effect with the frequency variable. There was only a very significant main effect for the frequency variable ($F = 3.33$, $df = 5/360$, $p < .01$). Only the quadratic trend component was significant ($F = 12.52$, $df = 1/360$, $p < .01$) and accounted for 75% of the variance associated with the frequency manipulation. There were also strong differences in the ratings of the various stimuli ($F = 10.30$, $df = 5/360$, $p < .01$).

BEAUTIFUL-NOT BEAUTIFUL RATINGS

The pattern of the beautiful-not beautiful ratings was similar to that obtained with the good-bad ratings, but the effects of the frequency and importance manipulations were not significant. Only the stimuli themselves differed among each other ($F = 4.09$, $df = 5/360$, $p < .01$).

EXPLORATION TIMES

The results of the different conditions are presented in Figure 2. In the guess condition, the exploration times decreased significantly as a function of frequency of exposure ($F = 11.07$, $df = 5/120$, $p < .01$). In this condition both linear and cubic trend components were significant ($F = 46.70$, $df = 1/120$, $p < .01$, and $F = 5.73$, $df = 1/120$, $p < .05$ respectively). The linear component accounts for 84.5% of the variance associated with the frequency manipulation while the cubic component accounts for 10.4%.

In the judgment condition, exploration also decreased although less regularly as a function of frequency of exposure ($F = 7.66$, $df = 5/120$, $p < .01$). The trend analysis revealed that only the linear trend component was significant ($F = 25.62$, $df = 1/120$, $p < .01$) and accounted for 67% of the variance associated with the frequency manipulation.

In the judgment + importance condition, the exploration times revealed a pattern which was rather similar to the one observed in the second condition. The effects of frequency were also highly significant ($F = 5.45$, $df = 5/120$, $p < .01$). Both linear and cubic trend components were significant ($F = 14.69$, $df = 1/120$, $p < .01$, and $F = 4.58$, $df = 1/120$, $p < .05$ respectively). The linear component accounts for 54% of the variance associated with the frequency manipulation while the cubic component accounts for 17%.

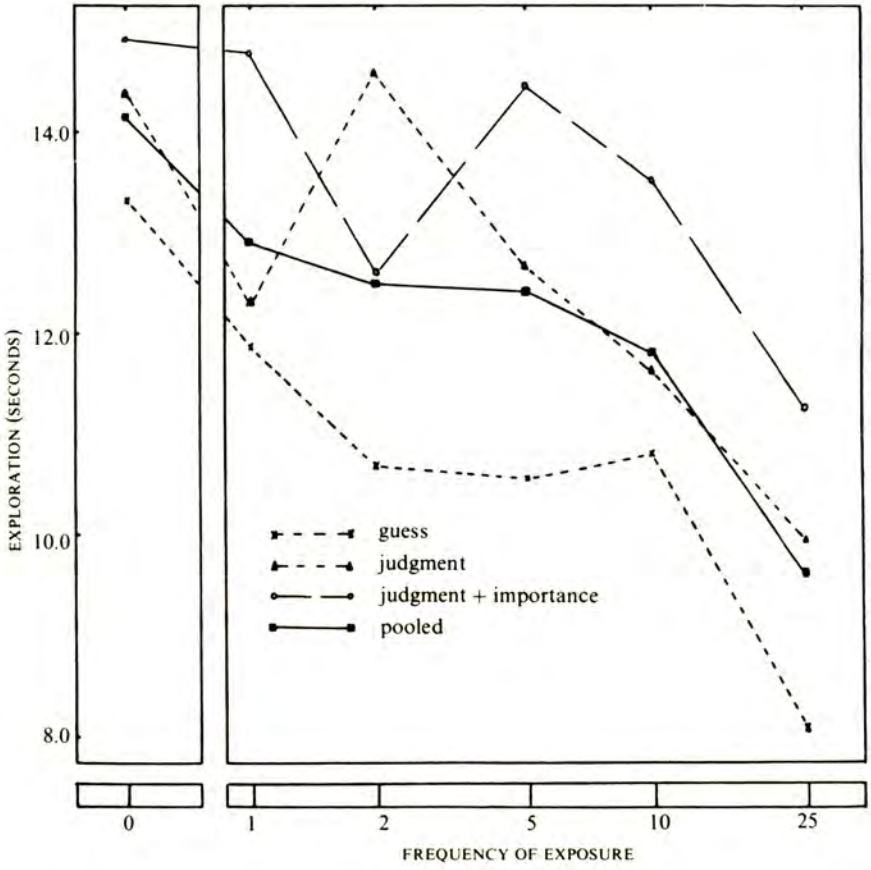

FIG. 2. EXPLORATION TIMES AS A FUNCTION OF FREQUENCY OF EXPOSURE AND OF DIFFERENT IMPORTANCE CONDITIONS

The analysis of variance performed on the combined data of the three conditions revealed that the main effect for importance did not really attain significance ($F = 2.67$, $df = 2/72$, $p < .10$). The main effect for frequency was highly significant ($F = 19.62$, $df = 5/360$, $p < .01$) but the Frequency x Importance interaction was also significant ($F = 2.38$, $df = 10/360$, $p < .05$).

DISCUSSION

On the basis of an analysis of previous studies (Vanbeselaere, 1974) within the framework of Berlyne's model, we predicted a significant interaction between the frequency and importance manipulations. The

results did not bear out this prediction. But on the other hand they still show that response competition by itself is not a sufficient condition to obtain the repeated exposure effect because the frequency effect was not significant in the low importance conditions. The stimuli seem to evoke conflict only when the response competition is made relevant psychologically.

It is possible that the predicted interaction would have been significant if higher frequencies of exposure would have been used. The judgment condition was replicated using higher frequencies of exposure (1, 2, 5, 10, 25, and 50). Frequency of exposure had a highly significant effect upon the favorability of the good-bad ratings ($F = 3.66, df = 5/120, p < .01$). In this condition both linear and quadratic trend components [3] were significant ($F = 10.12$, $df = 1/120$, $p < .01$, and $F = 7.80$, $df = 1/120$, $p < .01$ respectively). Frequency of exposure had also a very significant effect [4] on exploration ($F = 7.11$, $df = 5/120$, $p < .01$). As these data indicate, one can accept the contention that the conflict was not completely reduced after 25 presentations of a stimulus. One can therefore expect that the divergence between the importance conditions would still increase at higher frequencies of exposure.

The hypothesis that response competition and importance combine multiplicatively in determining the degree of conflict receives support however from the fact that the exploration times revealed a significant interaction between frequency and importance. It was predicted that, as far as the exploration times are concerned, the differences between the importance conditions would be most clearly observable at the lower frequencies of exposure. At higher frequencies, the importance conditions would no longer have such a clear differential effect. This prediction receives some support from the data.

The relationship between favorability of the good-bad judgments and frequency of exposure is clearly U-shaped. In the 0 frequency condition (i.e. no exposure of the stimulus before the rating phase) the good-bad judgment is almost exactly neutral. The favorability is clearly decreasing from 0 to 2 exposures. With higher frequencies, the favorability increases again and becomes somewhat positive. This is in line with Berlyne's contention that the effects of novel stimuli are not at their maximum with maximum novelty but with an intermediate degree of novelty.

If response competition is really created by the fact that a novel stimulus simultaneously activates response tendencies associated with other familiar stimuli to which it resembles, perhaps this stimulus must confront the subject a few times before he will experience clear response competition. A few confrontations with that novel stimulus can be

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[3] The mean good-bad ratings were 4.02, 3.65, 3.67, 3.77, 4.48, and 5.07 for the frequencies 1, 2, 5, 10, 25, and 50 respectively.

[4] The mean exploration times (in seconds) were 10.12, 11.47, 11.55, 9.27, 8.29, and 8.26 for the frequencies 1, 2, 5, 10, 25, and 50 respectively.

necessary to detect to what other stimuli it resembles. Only after this initial familiarization will the novel stimulus activate several competing response tendencies. A completely novel stimulus would then activate no clear response tendencies at the first confrontation. It is to be expected then that the evaluation of this novel stimulus will be almost neutral since no clear response tendencies are aroused, and that the evaluation would become less positive during the first exposures.

There is still another factor which could contribute to this initial increase of the conflict. Response competition will be reduced as soon as the inspection of the novel stimulus reveals some characteristics which make the object assignable to some familiar category. It is necessary therefore that the subject is able to recognize the novel stimulus each time that it is presented. When the stimulus is presented only a few times the subject could have the additional difficulty that he has to solve the problem whether the stimulus he is confronted with is exactly the same or somewhat different from a stimulus he saw earlier in the exposure series. It could take a few exposures before the subject has a clear picture of the stimulus so that he is able to recognize it easily. Although this recognition problem can explain the decrease of the favorability of the judgments at the lower frequencies, it does not explain why the judgments become positive at the high frequencies of exposure.

The exploration data seem to give some support for our suggestion that conflict increases at the lower frequencies of exposure. The sudden increase of the exploration from one to two exposures (judgment condition) or from two to five exposures (judgment + importance) which in both cases is followed by a steady decrease, could indicate that the number of activated response tendencies increases before the subject starts eliminating some of the response possibilities. The fact that this happens at a higher frequency in the higher importance condition is also in line with the hypothesis that importance strengthens the conflict.

Earlier experiments did not reveal this pattern however. Maybe this can be attributed to differences between the stimuli that were used. Our stimuli are in fact much more equal to one another than the stimulus words used in other experiments. They were all CVCCVCCVC words while the words used in other experiments are more clearly different from one another. There are also no data available about the association values of the different words. If it would appear that the words we used have a lower association value than the words used in almost all the other experiments, it would also be understandable why the response competition increases initially. While there are no response tendencies which are easily activated, the subjects could start to react more to the separate elements until they have a more clear picture of the words.

If the difficulty to identify clearly the several stimuli would increase the conflict, one would expect that a manipulation of stimulus discriminability would also affect the frequency effects. Zajonc et al. (1972)

manipulated the stimulus discriminability but this manipulation did not have a very clear effect.

One could also expect that a longer duration of the exposure would favor an easy identification of the different stimuli. Harrison & Zajonc (1970) reported results which indicate that a shorter exposure time did indeed result in more conflict. This difference between the two duration conditions was most clear in the lower exposure frequencies. When the duration of exposure was very short (two seconds), the response latency times increased from zero to two exposures, but the manipulation of exposure duration had no effect on the favorability of the judgments.

In conclusion, the experiments reported support the conflict interpretation of the exposure effect. Response competition is only one determinant of the amount of conflict and is by itself not a sufficient condition to obtain the exposure effect. This suggests also that the importance factor, which was manipulated in this study, was implicitly realized in prior experiments. The initial decrease of the favorability of the affective ratings at low frequencies of presentation demonstrates the necessity of a systematic manipulation of stimulus complexity within the repeated exposure paradigm.

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Received April 1976