

Generalization of a Modified Food Preference

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BIRCH LEANN LIPPS *Generalization of a Modified Food Preference* CHILD DEVELOPMENT, 1981, 52, 755-758 Preschool children ($N = 23$) preferences for 8 snack foods were assessed. 1 of 2 target foods from the set was selected for each child and presented consistently in a positive social context. After 20 presentations paired with positive adult attention, a significant enhancement of preference was noted. The preference data were also examined to determine whether enhancement was specific to the presented food or whether generalization of the enhanced preference to a similar food in the same food category occurred. The 8 snack foods used included 2 members of each of 4 food categories (fruit, cheese nuts, crackers). The children sorted the foods and, based on their sorting performance, were classified as semantic category sorters ($N = 11$) if they used the food categories as a basis for their sorting responses, or nonsemantic category sorters ($N = 12$) if they did not. The enhanced preference for the target food generalized to the other food in the same food category only for the children who used the semantic categories as a basis for their sorting performance.

Considerable evidence indicates that food preferences are modified by experience (see Beauchamp & Maller [1977], Birch [1980] for reviews of relevant literature). Birch, Zimmerman, and Hind (1980) reported that the formation of children's food preferences was influenced by the social-affective context in which food was presented. A target food, initially neutral in preference, was presented consistently to a child in one of four contexts: (1) in a nonsocial situation, (2) at snacktime, (3) as a reward paired with adult attention, or (4) noncontingently, paired with adult attention. Results indicated that both the reward and noncontingent attention conditions produced a significant enhancement of preference which persisted for at least 6 weeks after the cessation of the presentations.

The research reported below was designed to determine whether enhancement of food preference produced by presenting the food in a positive social-affective context was specific to the presented food or whether generalization of the enhanced preference to a similar food from the same food category occurred. In addition, the study provides a replication of the enhancement effect previously reported (Birch

et al 1980) employing a new set of foods and a different sample of children.

The procedures used in the research reported below to modify food preference are those employed in the noncontingent attention condition reported to enhance preference in the previous work (Birch et al 1980). To obtain evidence on generalization of a modified food preference, change in preference for a food from the same category as the target food was also evaluated. To determine the extent to which the children were using the food categories as a basis of similarity, each child was presented with triads of three foods and asked to sort the foods following the procedure described by Rosch and Mervis (1975). This information provided a basis for examining separately the preference data of children who do and do not sort the foods based on food category membership. It was expected that generalization of enhanced preference to the other food in the food category would occur for children who used these semantic categories as a basis for their sorting performance.

Participants were 23 preschool children, 11 females and 12 males attending the Child Development Laboratory preschool program at

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the University of Illinois The children ranged in age from 3-2 to 4-9 at the beginning of the study Each of the eight foods selected for use was a member of one of four food categories: fruit (canned peaches, canned unsweetened pineapple), cheese (colby, monterey jack), nuts (peanuts, cashews) and crackers (goldfish, wheat crackers) Cheeses and fruits were cut into bite-sized pieces, and whole pieces of the other items were used

The preference assessment procedure is described in detail in previous studies (Birch 1979a, 1979b, Birch et al 1980) Briefly, following a training session, each child was presented with and tasted small samples of each of the eight foods After tasting, the child placed each food in one of three categories, corresponding to "like," "dislike," and "okay" Subsequently, foods within each category were ranked in preference yielding a complete rank order These preference orders have been demonstrated to be reliable (Birch 1979a) as well as valid predictors of consumption (1979b) Preferences were assessed at the beginning of the study (assessment 1), after nine presentations (assessment 2), and after 20 presentations (assessment 3)

To determine the extent to which food categories were used by the children as a basis of similarity, each child performed a sorting task The sorting task was administered before the preference assessment procedure for all children because pilot data indicated that prior administration of the preference task tended to set the children to respond to the sorting task based on their preferences The two tasks were separated in time by at least 1 week to minimize effects of one task on the other Several training trials on the sorting task were given to each child Three pictures of household objects, two from one semantic category and one from another, were placed on the table The experimenter asked the child to "put the ones that are the same kind of thing (that are the same) together" The adult then asked, "How do you know these two are the same (go together)?" Children were not trained to sort on the basis of category membership during these trials but to perform the task by placing two of the three objects together

Following the familiarization trials, a tray containing the eight snack foods was presented After the child tasted and named the foods, a sample of each food was placed in a small plastic cup and these samples were presented in a series of 12 triads Each triad consisted of

two foods from one food category and one from another category, for example, two fruits and one cheese, and the child was asked to sort the foods using the procedure described above All responses were recorded without comment by the experimenter The order of the triads was randomly generated with the within-category pair appearing equally often in the three positions

Two foods from the set of eight were selected for presentation, one sweet (pineapple) and one nonsweet (cashews), following the noncontingent attention procedures described by Birch et al (1980) On the basis of their initial preference assessment data, children were assigned to receive one of the two target foods paired with adult attention Each child was assigned the food that was closer to the middle of the child's preference order, so that the food could show either an increase or a decrease in preference An additional constraint on the assignment of subjects to the two food presentation groups was that the two groups were matched on age and sex On a scale from 1 to 8 with 1 corresponding to most preferred the initial mean preference for pineapple was 5.9 ($N = 11$) for the children assigned to be presented with that food, and the mean preference for cashews was 6.0 for the children who were presented with that food

Once each day for 20 preschool session days, each child was approached by a female adult and presented with two pieces of pineapple (or cashews), paired with adult attention The adult greeted the child in a friendly manner and named the snack food while presenting it, for example, "Hi, George Here have some cashews" The presentation order was randomly determined The adult making the presentations was not involved in the preference assessment procedures All children were scheduled to receive 20 classroom presentations but due to absences the mean number of presentations was 18.5 (range 14-20) The food was accepted and eaten in 80% of the presentations, which were made on 3 days of the 4-day preschool program week Preferences were reassessed following 9 and 20 presentations

Because familiarity, which varies with exposure, has been shown to be a major determinant of children's preference for foods (Birch 1979a, 1979b), exposure to all eight snack foods was equated to eliminate the possibility that enhancement of preference for the food presented in the classroom was due to greater

exposure and familiarity with that food. Accordingly, all the children received two pieces of each of the other seven nontarget foods at snacktime on each day of the classroom presentations. Snacks were served by classroom teachers who were not otherwise involved in the study.

The data obtained on the three preference assessments formed the basis for statements regarding enhancement of preference for the presented food and for determining whether generalization of enhanced preference occurred. Based on their sorting performance, children were placed in one of two groups. Children who placed two of the three foods together on all 12 triads in a manner consistent with the food categories and who verbalized the categories as a basis for their performance were classified as semantic category sorters (SCS, $N = 11$). The other children, who did not consistently use the food categories as a basis of their sorting performance, were classified as nonsemantic category sorters (NCS, $N = 12$). Preliminary examination of the data revealed that the SCS children were slightly and significantly older than the NCS children, the mean ages of the two groups were 3-11 and 4-3, respectively, $t(21) = 2.40, p < .05$.

Results indicated that presentation procedures designed to enhance the children's preferences for the target food were very effective, 18 of the 23 children in the total sample showed an increase in preference from assessment 1 to assessment 3, two children showed no change, and three children's preference for the presented food declined. The mean preference for the presented target food for the total sample on a scale ranging from 1 to 8 was 5.95 on assessment 1 (prior to the presentations), 5.08 on assessment 2 (after nine presentations), and 4.00 on assessment 3 (after 20 presentations). Preliminary examination of the data revealed no trends for sex differences and a three-way repeated measures analysis of variance was performed on the preference data for the presented target food with food (pineapple, cashew), sorting performance (SCS, NCS), and number of presentations (0, 9, 20) as a repeated factor. The data were examined for heterogeneity of covariance following the procedure described by Box (1954), and no correction of the degrees of freedom was performed. Following the procedure recommended by Appelbaum and Cramer (1974) for non-orthogonal designs, the tests for interactions were all found to be nonsignificant, making it

appropriate to test for main effects. The only significant main effect was that of number of presentations, $F(2,38) = 8.84, p < .01$. No differences were noted as a function of either the child's ability to sort the foods or the food presented.

To determine whether the significant enhancement of preference noted for the presented food generalized to the food in the same category as the presented food (peaches in the fruit category and peanuts in the nut category) the position in the preference order of the generalization test food was traced across the three assessments. For the total sample, the mean position in the preference order of this food on assessment 1 and following nine and 20 presentations, respectively, was 4.9, 4.5, and 4.3. A three-way analysis of variance of the same form as that performed on the preference data for the presented target food was performed on the preference data for the generalization test food. The factors included were food (peaches, peanuts), sorting performance (SCS, NCS), and number of presentations (0, 9, 20). Following the procedure described by Box (1954) no correction of the degrees of freedom was performed. The only significant interaction was sorting performance \times number of presentations, $F(2,38) = 3.76, p < .05$, indicating that the magnitude of the generalized enhancement of preference differed for the SCS and NCS children. The SCS children showed a greater enhancement of preference for the generalization test food than the NCS children and a comparison of the cell means indicated a significant enhancement only for the SCS children from assessment 1, prior to the presentations, to assessment 3 following 20 presentations. For this group the mean preference rank for the generalization test food across the three assessments was 4.8, 4.6 and 3.3 respectively. In contrast, the corresponding preference ranks for the NCS group were 4.9, 4.4 and 5.3.

Results of the nonparametric analysis of the data are consistent with the results presented above. The 18 of 23 children who showed an increase in preference for the presented target food were placed in the appropriate cells of a fourfold table based on their sorting performance (SCS, NCS) and on whether or not they showed an increase in preference for the generalization test food. Of the eight SCS children whose preference increased for the presented target food, six showed generalization of enhanced preference

to the other food in the same semantic category. In contrast, of the 10 NCS children whose preference increased for the presented target food, only two also showed an increase for the generalization test food, Fisher's exact test $p < .05$. In other words, 75% of the children who showed enhanced preference for the target food and who used the food categories as a basis for sorting generalized this enhanced preference to the other food in the same food category, only 20% of the children who did not use the food categories consistently in sorting showed any evidence of generalization of preference.

The data have provided additional evidence regarding ways in which experience can influence the formation and modification of children's food preferences. If foods are presented consistently in positive social contexts preferences for those foods are enhanced. This result is consonant with that previously reported by Birch et al. (1980). The results also suggest a role played by cognitive processes in the development of children's affective reactions and preferences. Children's preferences for foods are directly related to their cognitions about those foods, as reflected in their sorting performance. Effects of the enhancement procedure were specific to the presented target food for children who did not demonstrate knowledge of its similarity to the generalization test food. In contrast, for children who used category membership as a basis of similarity the enhancement of preference was not specific, but generalized to the other member of the category. The age difference in sorting performance noted in the present study is consistent with that reported by Mervis (Note 1) for 3- and 4-year-old children, and the confounding of age with sorting performance in the present study suggests that the shift from a specific to a generalized enhancement of preference is age related and is mediated by cognitive development.

From a more applied perspective, these results suggest that parents and others who interact with young children and are involved in their feeding should be made aware of the

potential impact of the social context in which foods are presented on children's preferences for those foods. Food preferences can be enhanced through the use of a consistently positive social context and the effect was noted for both a sweet and a nonsweet food. The data of the present study indicate that these modified preferences are not restricted to the presented food but generalize to another food in the same semantic category, at least for children who employ these categories in making similarity judgments.

Reference Note

- 1 Mervis, C. Personal communication, September 1979.

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