Family Resemblance in Attitudes to Foods

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Although it seems likely that family experience should be a major factor in the acquisition of food preferences and attitudes to foods, prior research has not justified assignment of a significant portion of variance to family influences. This study differs from its predecessors, in that it compares young adults (instead of young children) with their parents and explores attitudes to food, especially sensitivity to cleanliness and contamination of foods ("disgust"), as well as food preferences. Questionnaires were answered by 34 university students (mean age = 19) and their families. Results indicate small positive parent-child correlations for food preferences ($r = .1$ to $.3$ for most items) and considerably larger correlations in the area of disgust or contamination sensitivity ($r = .3$ to $.6$ for most items). Children's preferences and attitudes are about equally related to those of their mother and father. Some small ethnic-group (half of the families were Jewish, half were Christian) effects were found in contamination sensitivity; these were minor in comparison to the family effects.

Although there is much variation in human food attitudes and preferences, very little of this variance has been explained. Common sense and cross-cultural surveys suggest that cultural background accounts for more of the variance than any other identifiable factor. However, there remains considerable within-culture variance. Previous studies, all of which examine food preferences, have revealed no factor that accounts for much of this within-culture variance. There is no evidence that sex and age (among adults) are good predictors (e.g., Babayan, Budayr, & Lindgren, 1966). Although biological factors account for some similarities across all people, only a few biological differences that account for any within-culture variance have been identified, and the effects are small (e.g., Glanville & Kaplan, 1966). Specific experiences, such as learned food aversions (based on ingestion followed by nausea), account for only a very small percentage of acquired food dislikes (Garb & Stunkard, 1974; Logue, Ophir, & Strauss, 1981; Pelchat & Rozin, 1982; Rozin & Fallon, 1980). What then is the cause of the substantial within-culture variance?

The most likely sources of within-culture variance are genetic factors and early experience. The influence of either of these factors would be manifested in positive correlations between parents and their children. In order to draw a proper inference about familial influences, one must factor out (or control for) common culture as a source of concordance in children’s and parent’s scores. The few studies in the literature deal with resemblances in food preferences between young children and their parents. The effects reported are very weak or absent (Birch, 1980; Bryan & Lowenberg, 1958; McCarthy, 1935). For example, Birch (1980) asked nursery school children and their parents to taste and rank order their preferences for four different sets of eight foods (fruits, sandwiches, vegetables, and snacks). Correlations between the rankings by children and their parents were substantial but only slightly higher than correlations of children with other children's parents in the sample. Given the enormous amount of food-related contact between parents and children, it is hard to believe that there are no substantial effects. We suggest four reasons for the absence of substantial family effects in previous studies: (a) The young children studied have been exposed to their parents for only 3 to 5 years; (b) It is more difficult to get meaningful and reliable measures of preference for young children from either the children or their parents.

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(see Birch, 1980); (c) Preschool children have very different preferences and attitudes than mature adults, so direct comparisons of preferences are difficult; (d) Preferences for particular foods (the only measures used in previous work) may be the least family-influenced aspect of food-related behaviors and attitudes.

We address the possible reasons for negative results in prior work by studying the relation between the food preferences and attitudes of young adults and their parents. These two groups have generally similar (adult) food attitudes and have had many years of exposure to each other in the family setting. (A parallel study by Pliner (in press) takes a similar approach). Furthermore, we extend beyond the usual food-preference survey to examine attitudes to foods, especially sensitivity to the offensiveness (disgust) of some foods. This latter addition is an extension and application of our earlier research (Rozin & Fallon, 1980; Rozin & Fallon, 1981; Fallon & Rozin, 1983a; Fallon & Rozin, 1983b) and suggests that people reject certain potential foods as "disgusting," because of the idea of what they are (e.g., feces, insects, worms, in American culture). They are believed to taste bad (though they have usually never been tasted) and are offensive in odor and appearance (as potential food). They also are contaminants; that is, their contact or association with a liked food will render it inedible or undesirable, even when the contact involves trace amounts that would be undetectable by taste, smell, or sight. Although, so far as we know, people in all cultures have such disgusts, people vary greatly in sensitivity to disgust both across and within cultures (Fallon & Rozin, 1983b) and suggests that they contact or association with a liked food will render it inedible or undesirable, even when the contact involves trace amounts that would be undetectable by taste, smell, or sight. Although, so far as we know, people in all cultures have such disgusts, people vary greatly in sensitivity to disgust both across and within cultures (Fallon & Rozin, 1983b). For example, some people would still like a bowl of soup after a grasshopper fell in and was removed, whereas others would not consume soup from this bowl even after the bowl was washed three times and refilled with fresh soup.

We (Fallon & Rozin, 1983b) conceive of two types of contamination sensitivity. Trace contamination assumes the possibility that a small amount of the offensive food might actually be in the food in question (as in a soup bowl after the grasshopper was removed). Associational contamination involves a pure ideational relation between the "contaminant" and the food in question, with no possibility of a physical trace (as in rejection of a desirable food that has contacted a brand new fly swatter or is served in a brand new dog bowl).

In this study, we look at young adult–parent similarities for both of these types of contamination sensitivity and also examine a number of other attitudes to food and food preferences.

Method

The reference ("target") subjects were 34 volunteer college students (all white, 17 Jewish and 17 Christian) in the first two years of college at the University of Pennsylvania and both of their parents. All families were from the Northeastern United States. In all of the families, both biological parents of the child were alive, still married, and had been continuously together from the birth of this child until the time of this study. Father, mother, student, and any available siblings above 10 years of age filled out questionnaires at home with instructions not to discuss their responses until all family members had completed them. No attempt was made to delimit the time of day at which the questionnaires were completed. The total sample contained 143 subjects: 34 students (mean age 19.5; range 17–23), 41 siblings (mean age 19.0, range 11–36 years), 34 fathers (mean age 53.3), and 34 mothers (mean age 50.5). Fifteen of the 34 students and 23 of the 41 siblings were male. In no Jewish family were all of the responding members Kosher; 14 of the 17 families included at least one member who was kosher at one time. Of the 68 Jewish subjects 40 had never been Kosher, 18 were Kosher once but not now, and 10 were currently Kosher.

Each participant filled out a questionnaire that had three parts: food preferences, disgust or contamination sensitivity, and miscellaneous. The food-preference section contained a list of 22 items selected from prior questionnaires on the criteria that their hedonic ratings were highly variable across subjects. Items were also selected to include some strong tasting foods, and some that might be seen as strange or disgusting. The 22 items were as follows: radishes, beef liver, plain yogurt, diet soda, black olives, black coffee, soft-boiled eggs, sweet pickles, peppermint candy, lima beans, liverwurst, over-ripe banana, chicken curry, submarine sandwich with hot peppers, raw clams, tongue, Limburger cheese, cow pancreas, cow heart, cooked lizard, raw daisy, and cooked eel. Subjects rated their liking for each item on a 9-point hedonic scale (1 = dislike extremely; 2 = dislike very much; 3 = dislike moderately; 4 = dislike slightly; 5 = neither like nor dislike; 6 = like slightly; 7 = like moderately; 8 = like very much; and 9 = like extremely). If the subject had never tried the item in question, he or she rated it on another scale indicating readiness to try it (1 = would definitely not try; 2 = would probably not try; 3 = not sure; 4 = would probably try; and 6 = would definitely try). We assigned these numbers to correspond as well as possible to the values on the 9-point hedonic scale. In analyzing the data, we treated the numerical scores for the "hedonic" and "readiness-to-try" scales as equivalent.

The disgust–contamination section was a series of 24 questions, all involving some sort of contamination of otherwise highly desirable food. Subjects were asked to rate how much they would like to eat (using the same 9-
point hedonic scale described above) each of the "contaminated" items. The questionnaire read as follows.

Select a bowl of a particular type of soup that you like extremely (that you would rate "9" on the scale above), as something to eat. How much would you like to eat that soup (enter a number from 1 to 9)? 1. from a thoroughly washed used dog bowl. 2. from a brand new dog bowl. 3. from a regular soup bowl, after it was poured out of a thoroughly washed used dog bowl. 4. same as 3, but the soup is cooked for 15 minutes before you eat it. 5. in a regular bowl, stirred by a thoroughly washed used fly swatter. 6. in a regular bowl, stirred by a brand new fly swatter. 7. in a regular bowl, cooked for 15 minutes after being stirred by a thoroughly washed used fly swatter. 8. stirred by a thoroughly washed used comb. 9. stirred by a thoroughly washed used comb and then cooked for 15 minutes. 10. stirred by a brand new comb.

Consider a bowl of this soup with a washed, dead grasshopper in the bottom. How much would you like to eat? 11. All of this soup (but not the grasshopper itself). 12. A little soup from the top of the bowl. 13. All of this soup after the grasshopper was removed. 14. New soup from the same bowl. 15. New soup from the same bowl, but after it had been washed three times. 16. New soup from the same bowl, after it had been in a diswasher once.

Consider the same type of soup, in a new setting, and without any grasshopper. Now suppose that a clean, non-toxic leaf from a houseplant falls into the soup, and goes to the bottom. How much would you like to eat? 17. All of this soup, but not the leaf, itself. 18. A little soup from the top of the bowl. 19. All of this soup after the leaf was removed. 20. New soup from the same bowl.

Select a cookie that you would like extremely (rating of 9) as something to eat. Rate how much you would like to eat this cookie, after a bite had been taken by. 21. an acquaintance. 22. a good friend. 23. a waiter in a restaurant. 24. How much would you like to eat the above cookie (unbitten) after it had fallen on a lawn while you were picnicking?

The miscellaneous section of the questionnaire explored knowledge of cuisine, importance of cooking and eating, and interest in variety and exoticism in food. Culinary knowledge was assessed by responses to six questions (fill in answers): "Write in the name of the country associated with each of the following foods: sushi, paella, moussaka, biryani, trifle, and mousse." The culinary knowledge score was simply the number of correct answers (0–6).

Importance of food was determined by asking subjects to rank order eight common activities (reading, socializing, eating, sports, movies/theatre, music, cooking, sleeping), to rank order eight common activities (reading, socializing, eating, sports, movies/theatre, music, cooking, sleeping), from most to least favorite. The ranks for eating and cooking were the measures of their importance.

The basic measure of parent–child resemblance is a Pearson $r$ between parent and child scores (34 pairs). We used the midparent values, (mean of mother and father) and compared them to the child's scores. (Correlations of midparent values with the midsibling values produced similar results, which are not presented here.)

In the area of disgust and contamination, parental attitudes account for a substantial portion of the variance in their children. An overall measure of disgust sensitivity was obtained by summing the scores on all 24 contamination questions, for each subject. The midparent-child correlation was .524 ($p < .001$). Correlations for all 24 individual items were positive (range .114 to .560, 20 of 24 significant by at least $p < .05$). The results from selected questions, sampling one question from each contaminating substance series are presented in Table 1. Associational contamination items (brand new dog bowl, fly swatter, and comb) showed the lowest correlations. For all contaminating substances there was at least one question (level of contamination) that showed a substantial ($r > .395$) correlation.

In contrast, parent–child resemblances on food preferences were quite small. The simplest measure is the parent–child correlation for each of the 22 food items. These correlations varied from -.035 to .460, with a mean of .152. Black olives showed the highest correlation ($r = .501$, see Table 1).

A measure of general liking for and/or willingness to try food was computed by summing the ratings of all 22 items for each subject ($r = .175, ns$).

There were no significant parent–child effects for culinary knowledge, rank of eating, variety or exotic food preference, although correlations were positive in all of these cases except variety (see Table 1). Rank of cooking was the only significant parent–child effect ($r = .410, p < .01$; see Table 1).

Correlations between mothers and fathers tended to be larger than parent–child corre-
Table 1

Parent-Child Relations in Food Attitudes (Pearson rs)

<table>
<thead>
<tr>
<th>Measure</th>
<th>No. families</th>
<th>Mean 22 preferences</th>
<th>General liking</th>
<th>Black olives</th>
<th>Sum 24 contaminants</th>
<th>Used dog bowl</th>
<th>New fly swatter</th>
<th>Washed comb</th>
<th>Grasshopper spill</th>
<th>Leaf in</th>
<th>Acquaintance bite</th>
<th>Picnic drop</th>
<th>Rank eating</th>
<th>Rank cooking</th>
<th>Culinary knowledge</th>
<th>Variety</th>
<th>Exotic preference</th>
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<td>417**</td>
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Note: Ma = mother; Pa = father. Decimals have been omitted.

* p < .05 (one-tailed t test). ** p < .01 *** p < .001.

lations for both disgust and preference (see Table 1). Mother and father showed substantial concordance in rank of cooking and culinary knowledge, and a large (r = .511) resemblance in preference for exotic foods, in contrast to the lack of significant parent–child correlations on this same measure.

Cultural Factors

We now examine the extent to which our only substantial family resemblance effect, disgust, can be accounted for by "cultural" factors. We compared the full sample (N = 34 families) midparent–child correlations with the corresponding values generated from the 17 Jewish and Christian families considered separately.

For overall disgust sensitivity, cultural effects are present but are small in comparison to familial effects. Taking all subjects (including siblings) into account, the Jewish–Christian distinction accounts for 6.9% of the total variance. "Within culture" parent–child correlations remain substantial and are significant in many cases, in contrast to the lack of significant parent–child correlations on this same measure.

Nature of Parent–Child Effects

Since the mother typically has much more contact with the child than the father and traditionally has a special role in food selection (shopping), cooking, and monitoring feeding, it seems reasonable to predict a higher mother–child (Ma–Child) than father–child (Pa–Child) correlation. The data do not support such a hypothesis (see Table 1). We will consider only the substantial disgust-sensitivity correlations but we present data from all aspects of the study in Table 1. For disgust sensitivity, the differences, although not significant, favor greater potency for the father (r = .458 Ma–Child, p < .01, r = .521 Pa–Child, p < .001; the Ma–Child correlation was higher in only 10 of 24 questions).

One might also expect a greater similarity across same-sexed parent–child pairings, based on notions of "modeling." The results do not support this prediction. For disgust sensitivity, using data from all of the siblings, for 11 of 24 questions male siblings resembled their mother more than their father, and in 8 of 24 cases females resembled their mother more.
Sex Effects

Our data allow an informal examination of sex differences in preferences and attitudes to foods. Of course, the 72 males and 71 females in our sample are not independent but rather are drawn from 34 families. There are indications of sex differences in culinary knowledge, rank of cooking, and some preferences. However, of all the questions (22 preference items, 24 disgust sensitivity, and 5 miscellaneous) there was only one instance (preference for liverwurst) where there was a mean sex difference of more than 1 point on the hedonic (or other) scale.

Discussion

We have reported small parent-child correlations for food preferences and general liking for food and substantially larger correlations in the area of disgust (and also ranking of cooking among favorite activities). This is the first study to examine familial resemblance in attitudes to food, and specifically disgust sensitivity, and so far as we are aware, it reports the highest parent-child within-culture correlations in any food-related area. In this study, all of the families in the sample were whites from the Northeastern United States, a moderately homogeneous group from the point of view of culture. A further partitioning of our sample into Jewish and Christian families reduced variation slightly but very little compared to the family effect. However, we must remember that it would be possible, in principle, to account for most parent-child effects as culture-based, if one takes the view that each family teaches its children its own interpretation of the culture in question (including, for example, following kosher practices, a difference among Jews that might account for somewhat higher parent-child correlations in Jewish families). That is, the distinction between family and culture effects is blurred. Accepting the usual rather broad definitions of cultural groups, we feel that our positive results are best viewed as within-culture effects.

We attribute the positivity of our results to two differences between our study and prior research. First is the use of young adults as the target children. The importance of this factor is confirmed by an independent report by Pliner (in press) of significant correlations between young-adult Canadian children and their parents, on pattern of food preferences (correlation of parent and child hedonic scores across 47 foods), in comparison to child-pseudo-parent correlations. The second factor is our use of the disgust questions.

We note that mother-father correlations are equal to or higher than child-parent correlations, in most cases. Parent correlations can come about because of two types of factors: assortative mating or mutual influence. Price and Vandenberg (1980) have presented data from American and Swedish couples, indicating a substantial role for assortative mating in accounting for spouse similarity across a wide variety of measures. However, for a minority of measures, concordance increased significantly with years of marriage. These measures included frequency of consumption of beverages and a few foods. These results suggest that food use (in this case, behaviors, not attitudes) is an area where contact does matter but for which there is also assortative mating. The presence of the latter effect, as well as the fact that parents typically have a longer period of mutual exposure to each other than to their children, might suggest why the mother-father correlations are slightly higher.

Parents would be expected to influence their children's food attitudes through three basic routes: genetic factors, regulating the child's exposure to different foods, and displaying attitudes to food for the child to imitate. In the latter two cases, one might expect the mother to be the more potent influence, because of the greater time spent with the mother in interactions concerning food and the mother's key role in food selection. Yet our data reveal no greater influence for the mother. Analyses by Burt and Hertzler (1978) and Pliner (in press) also reveal no differential effects of mother and father. These results argue indirectly for a role for genetic factors. A modeling approach would further suggest that the same-sex parent should be the more appropriate model, so that same-sex parent-child correlations should be higher. Although Pliner (in press) obtains this effect for food preferences, we do not.

The large parent-child resemblance in disgust sensitivity could result from specific
childhood socializing experiences, as well as continued "exposure" effects. We have suggested (Rozin & Fallon, 1981) that the disgust category develops in children during the toilet-training experience, with feces as the primal (and universal) disgust (Angyal, 1941; Ferenczi, 1952). Severity of toilet training, and/or amount of "disgust" or revulsion shown by the parents in response to changing of the diapers, and so forth, might influence disgust sensitivity. The food-cleanliness item (the picnic question) showed one of the largest effects, so that perhaps much of what we measure as disgust is related to temperamental dimensions like general concern for cleanliness or fastidiousness. There are some reports (Sears, Maccoby, & Levin, 1957) of weak linkages between toilet training and both feeding problems and concern for cleanliness. Our data do not shed light on the origins of disgust, except to implicate important family factors. Given the universality of disgusts and the related phenomena of taboo and pollution, we would hope that this demonstration of a familial link would provide a stimulus for further research on these potent responses to foods.

In our view, the main contribution of this study is to establish a family effect on food attitudes. Prior to this work, common sense and intuition, but not empirical results, argued for this relationship. Although almost all prior research dealt with food preference, we found our biggest effect in another area, disgust sensitivity. We suggest that individual food preferences are only a part of human relations to foods and that future studies on family resemblances should include measures of disgust, desire for variety, and the significance of food. In the case of disgust, we have identified the family as an important source of individual variation, which may exert its effects through both genetic and environmental routes.

References


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