Reprinted from *J. Food Sci.*
47(5): 1553-1557 & 1561

Relationships Between Food Preferences and Food Acceptance Ratings

ARMAND V. CARDELLO and OWEN MALLER

ABSTRACT

A study was conducted to assess relationships between food preference ratings and food acceptability ratings. Acceptability ratings for each of two discriminably different samples of nine food items were obtained using the 9-point hedonic scale. Regression analysis indicated that no linear relationship existed between these ratings and either hedonic or frequency preference ratings of the foods. In addition, the range of acceptability ratings was smaller than the range of corresponding preference ratings. Panelists' expressed preferences had no effect on their assignment of differential acceptance ratings to different samples of the items. Correlations between preference ratings of laboratory panelists and military field panelists were good, in spite of higher absolute preference ratings assigned by the laboratory panel.

INTRODUCTION

A NUMBER of techniques are available to measure consumer likes and dislikes for food. Most of these techniques can be subsumed under the rubrics of "preference," "acceptance" or "consumption" measurement. Unfortunately, the definitions of these terms have varied considerably in the literature. For the purpose of this report, these terms are defined as

(1) preference – the expressed degree of liking or disliking for a food when obtained in response to a food name;

(2) acceptance – the expressed degree of liking or disliking for a food when obtained in response to a prepared sample of the food; and

(3) consumption – the number and/or amount of a food item(s) that is (are) actually ingested.

Note that the term "preference" is being used in the sense of "psychological continuum of affectivity" (IFT, 1981) and not in the strict sense of "choice of one object over another." The contrasting element between the definition of "preference" and the definition of "acceptance", i.e., food name vs food sample, is consistent with prior definitions and usage (Branch, 1973; Meiselman and Waterman, 1978) and with the fact that both measures can be obtained using the hedonic scale (IFT, 1981).

In general, preference techniques (interviews, written surveys, etc.) are used to obtain information for menu planning or to assess new markets for established products. Acceptance techniques (hedonic tests of food) are used to obtain information about new products or different brands or formulations of the same product, when a single food name does not discriminate among the products. Consumption techniques (shelf disappearance measures, proportion of servings eaten, etc.) are most often used to obtain information on consumer behavior, especially when food waste is of concern.

Much of the early research and development in the areas of food preference, acceptance and consumption was carried out at the Quartermaster Food and Container Institute in Chicago. This work has been continued at the U.S. Army Natick Research and Development Laboratories (NLABS) in Natick, MA. The emphasis of the early research was on the development of a measure that would predict consumption. This line of research culminated in the development of the 9-point hedonic scale (Peryam and Girardot, 1952; Peryam and Pilgrim, 1957) for preference and acceptance testing. This scale is comprised of nine labeled categories, ranging from "like extremely" to "dislike extremely." The scale also contains a neutral category that is labeled "neither like nor dislike." It is assumed that the intervals between adjacent categories of the scale are perceptually equivalent, although this point has been disputed.

Following the development of the 9-point hedonic scale, many investigators used the technique to study food preferences, because of its ease of administration and its high reliability coefficients, reported to be 0.94–0.99 for groups (Peryam et al., 1960; Schutz, 1957; Waterman et al., 1974; Wyant et al., 1979) and 0.74 (Smutz et al., 1974) and 0.60 (Waterman et al., 1974) for individuals. Frequency preference measures, which index the desired frequency with which a respondent wishes to eat a food item, have also been developed (Schutz, 1965; Meiselman et al., 1972; Meiselman, 1973). These measures have been used frequently for menu planning, and have been shown to have reliability coefficients of 0.97 (Schutz, 1965) and 0.98 (Waterman et al., 1974) for groups and 0.69 (Smutz et al., 1974) and 0.58 (Waterman et al., 1974) for individuals.

Preference vs consumption

In a series of studies examining the relationship between preference and consumption measures (Peryam and Pilgrim, 1957; Schutz, 1957; Kamenetzky et al., 1957; Kamenetzky and Pilgrim, 1958; Peryam et al., 1960; Pilgrim, 1961; Kamen, 1962) preference ratings for foods obtained using the hedonic scale, were correlated with either the proportion of food servings that were eaten or the proportion of subjects selecting the food items. The results of these studies indicated that about 25–50% of the variability in consumption measures could be accounted for by the preference measures (Pilgrim, 1961). More recent studies have confirmed these early results, finding correlation coefficients with consumption of 0.51–0.86 (Seaton and Peryam, 1970), 0.44–0.50 (Smutz et al., 1974), 0.35–0.40 (Sullins et al., 1977) and 0.48 (Wyant et al., 1979) for hedonic preference measures and coefficients of 0.30–0.34 (Smutz et al., 1974) and 0.59–0.66 (Sullins et al., 1977) for frequency preference measures.

Of the factors affecting the correlations between preference and consumption, Kamenetzky et al. (1957) have shown higher correlations for "dispensable" food items, such as desserts and side dishes, than for staple items, such as meats, cereals and bread. Not surprisingly, higher correlations were also observed when both preference and consumption measures were obtained from the same populations (Kamenetzky et al., 1957) or when a larger variety of food items was included in the evaluation. In addition, it has been reported that preference ratings obtained via

Authors Cardello and Maller are affiliated with the Food Acceptance & Food Senses Group, Behavioral Sciences Division, Science and Advanced Technology Laboratory, U.S. Army Natick Research & Development Laboratories, Natick, MA 01760.

the hedonic scale technique reflect the respondents opinion of the "best preparation" of that food item (Kamenetzky and Pilgrim, 1958).

Acceptance vs consumption

Although the development and study of acceptance measures have paralleled the study of preference measures, few studies have correlated acceptance with consumption. In one study (Kamenetzky and Pilgrim, 1958) three sets of military consumption data were correlated with civilian acceptance and military preference data. The resulting correlation coefficients between acceptance and consumption were +0.58, +0.43 and +0.38, while the coefficients between preference and consumption were +0.80, +0.65 and +0.60. Since the acceptance measures were obtained in response to single sample presentations, Kamenetzky and Pilgrim (1958) concluded that preference measures were better predictors of food consumption than were acceptance measures obtained in single sample tests. Curiously, the fact that both the preference and consumption measures were obtained from military populations, while the acceptance measures were obtained from a civilian population, was not cited as a factor contributing to the higher correlations between preference and consumption. While this oversight can be attributed to previous findings (Peryam and Haynes, 1957) that acceptance ratings of civilian and military personnel are highly correlated (r = +0.92), a more recent study (Nichols et al., 1972) has shown that the acceptance ratings of civilians differ by food item from those of military personnel.

In addition to civilian vs military differences, laboratory vs field differences can affect acceptance judgments. Ellis (1969) has pointed out that laboratory acceptance panels, whether civilian or military, do not provide a good index of the level of acceptance in the field, because of a more ciritical attitude toward foods in laboratory panels. Sidel et al. (1972) working with a laboratory panel and citing the paucity of information on the relationship between acceptance and consumption measures, conducted a study in which both measures were obtained from the same laboratory population. This eliminated both the problems of civilian vs military populations and laboratory vs field populations. In an evaluation of four different brands of beer, Sidel et al. (1972) had the panel rate the beers for acceptance, using the 9-point hedonic scale. They then measured ad libitum consumption of the beers in the same individuals. The correlaton coefficient between acceptance and consumption was +0.81 under these conditions.

Preference vs acceptance

The relationship that has been least often examined is that between preference and acceptance. Moreover, the two relevant studies conducted to date have confounded population differences and laboratory/field differences with the differences between measures. As noted above, Kamenetzky and Pilgrim (1958) correlated preference measures of military personnel with acceptance measures of civilian laboratory personnel and obtained correlation coefficients of +0.38 to +0.58. Similarly, Branch (1973) correlated two sets of military preference data with acceptance measures from civilians and with acceptance measures from a third military population. He reported correlation coefficients of +0.34 and +0.38 between the military preference and civilian acceptance measures, and coefficients of +0.08 and +0.01 between the preference and acceptance measures obtained from the different military populations. The correlation between the civilian and military acceptance measures was +0.15.

No study to date has examined the relationship between preference and acceptance in the same individuals. This is unfortunate, especially in view of the important role that food acceptance testing plays in food research and development and the possible influences of attitudes on acceptance judgments. From the point of view of a sensory evaluation manager, it is important to know whether a panelist's attitude (expressed preference for a food) will affect his/her judgment of the acceptability of test samples of that food. Will the preferences of individuals for vegetables or sweetened products, affect their judgments of the acceptability of these products? Does someone who dislikes liver, okra or maple sugar candy, give these products lower acceptance ratings, regardless of their intrinsic quality, than does someone who has a strong preference for these items? And is this individual more, less or equally sensitive to qualitative differences among different preparations of these items? Although common practice is to screen out consumer panelists who dislike test products, it is not a universal practice, and without empirical data, it may be an unnecessary one.

The present study was conducted to assess the relationship between preference and acceptance measures within the same sample of consumers. Also investigated were the effect of food preferences on the likelihood of the individual to hedonically discriminate among different samples of the same food and the realtionship between the food preferences of civilian and military populations.

METHOD

Subject

The consumers in these experiments were 359 members of the Food Acceptance Laboratory Consumer Taste Test Panel at NLABS. This panel is comprised of civilian and military personnel who have volunteered to participate in consumer acceptance tests. The panel is comprised of 66% males and 34% females. The age of members varies from 17 to 70 years with a mean age of 42.4 years. Approximately 89% are civilians, and the remainder are enlisted personnel and officers stationed at NLABS. The frequency of participation of members in acceptance tests varies, ranging from once per year to 40 or more times per year.

In addition to the data collected from the above panel, data obtained previously from two large-scale military food preference survey studies (Wyant et al., 1979) were used for correlational analysis. The respondents in these latter surveys were military personnel stationed at Travis Air Foce Base, California during the test periods of March 1977 and January 1978. Complete details on this population can be found in Wyant et al. (1979).

Procedure

Preference testing. Over a 6-wk period, 359 members of the laboratory consumer panel were administered the Armed Forces Food Preference Survey (Wyant et al., 1979). This questionnaire consists of 200 food item names for which hedonic-preference ratings are obtained using the 9-point hedonic scale. In addition, the questionnaire solicits frequency-preference ratings (number of times per month the item is desired). Panelists in these tests were requested to complete the questionnaire during scheduled test sessions in the Food Acceptance Laboratory. All survey forms were self-administered and checked by laboratory personnel to ensure that instructions were followed. Military personnel in the tests conducted by Wyant et al., (1979), were administered the questionnaire at the base recreation center, and the questionnaires were also checked to ensure that they were completed correctly.

Acceptance testing. All acceptance tests were conducted in the Food Acceptance Laboratory at NLABS. The facilities consist of air-conditioned, light-controlled, sensory testing booths. All acceptance measures were obtained using the 9-point hedonic scale.

A total of 27 samples of foods were tested. Three different samples of each of nine different foods and/or beverages were prepared. For each food or beverage, the three samples consisted of two identical samples (A&B) of a standard preparation of the item and one sample (C) of an adulterated version or different brand of the product. The odd sample was chosen following pilot testing, to ensure a discriminably different, but not necessarily better or worse, product. Table 1 lists both the adulterated and unadulterated samples used

in these tests. As can be seen, the food items consisted of three entrees, three vegetables and three beverages. In addition, the items were chosen to represent high, medium and low preference foods as determined by the food preference data of Meiselman et al. (1974).

During each of nine test sessions, a random sample of 36–44 panelists rated the acceptability of three test samples of a single food item. Order of presentation of samples was counterbalanced among panelists. A different random sample of panelists was used for each test. All acceptance tests were conducted approximately 6–8 wk after the preference surveys were administered.

RESULTS

ACCEPTANCE RATINGS assigned by each panelist to the two identical samples (A and B) of the food items, as well as preference ratings assigned by the same panelists to these foods were averaged across panelists. The means and standard deviations for each of the nine food items are shown in Table 2.

Table 1—Food samples used in acceptability testing

Food or beverage item	Mean preference rating[a]	Identical samples (A and B)	Different sample (C)
Whole milk	7.98	Homogenized Milk (Hood Co.)	diluted by 1/3 with distilled water
Bacon	7.33	Grilled Bacon (Hygrade West Brand)	Smoked Bacon (John Morrell Brand)
Hashed Browns	7.03	Instant Hash Browns (Betty Crocker Brand)	4 times normal salt addition
Frank-furters	6.27	Broiled Frank-furters (Fenway Brand)	Boiled frank-furters (Oscar Meyer Brand)
Pork & Beans	6.21	Canned Pork and Beans (Van Camp's Brand)	5 tablespoons of dry mustard added per 40 oz.
Tomato Juice	5.84	Canned Tomato Juice (Libby's Brand)	diluted by 1/3 with distilled water
Lima Beans	4.69	Fresh Frozen (Wintergarden Brand)	4 times normal salt addition
Liver and Onions	4.64	Fresh Broiled Liver (calves) and Onions	Fresh broiled liver (lamb) and onions
Skim Milk	3.84	Skim Milk (Hook Co.)	diluted by 1/3 with distilled water

[a] From Meiselman et al. (1974); based on 9-point hedonic scale.

Table 2—Mean preference and mean acceptability ratings[a] for nine selected test foods

Food or beverage item	Preference mean (Std dev)	Acceptability mean (Std dev)
Whole Milk	7.88 (1.09)	7.12 (1.13)
Bacon	7.63 (1.00)	6.34 (1.65)
Hash Browns	6.95 (1.07)	5.57 (1.80)
Tomato Juice	6.90 (1.37)	6.90 (1.45)
Frankfurters	6.88 (1.45)	6.67 (1.62)
Pork and Beans	6.64 (1.62)	6.61 (1.40)
Liver and Onions	6.19 (2.33)	6.72 (1.67)
Lima Beans	5.80 (2.08)	5.86 (1.75)
Skimmed Milk	5.08 (2.09)	6.08 (1.23)

[a] All mean ratings are based on a 9-point hedonic scale.

Looking first at the preference data, it can be seen that the three food items designated as high preference items on the basis of previous data (Table 1) did, in fact, have the highest mean preference ratings in this sample population. Similarly, the three items designated as low preference had the lowest mean ratings, and the three items designated as medium preference had intermediate ratings. In order to assess the degree of linear association between the preference and acceptance ratings, a Pearson product-moment correlation coefficient was calculated across all food items. A coefficient of +0.20 was obtained, reflecting poor linear association between the two measures. However, further examination of the mean ratings in Table 2 revealed an apparent nonlinear association. That is, for each of the three high-preference items, the mean acceptability ratings were less than the corresponding mean preference ratings, whereas for each of the three low-preference items, the mean acceptability ratings were greater than the mean preference ratings. For the other three items, one showed no difference between the mean preference and acceptance ratings, while the other two had lower acceptance ratings.

Fig. 1 is a plot of the difference between the preference and acceptace ratings for each item (ordinate) as a function of the item's mean preference rating (abscissa). For low preference items, the acceptance ratings have a positive difference score. For high preference items, the acceptance ratings have a negative difference score. Linear regression analysis of the data in Fig. 1 revealed a significant correlation between preference and difference measures ($r = -0.82$, $p < 0.01$).

In order to assess the degree of linear association between hedonic preference and acceptance ratings for individual food items, Pearson product-moment correlation coefficients were calculated between the individual raw scores for each food item. Table 3 shows these correlation coefficients, along with the coefficients obtained by collapsing across food items. Since two unadulterated samples of each food were tested, the correlations with preference are shown for each sample separately, as well as for the mean acceptance rating of the two unadulterated samples. Only the correlations across all foods (359 data points) and for liver and onions are statistically significant, and the former are not of predictive value.

The data in Table 2 also reveal that the standard deviation of preference scores increases with decreasing prefer-

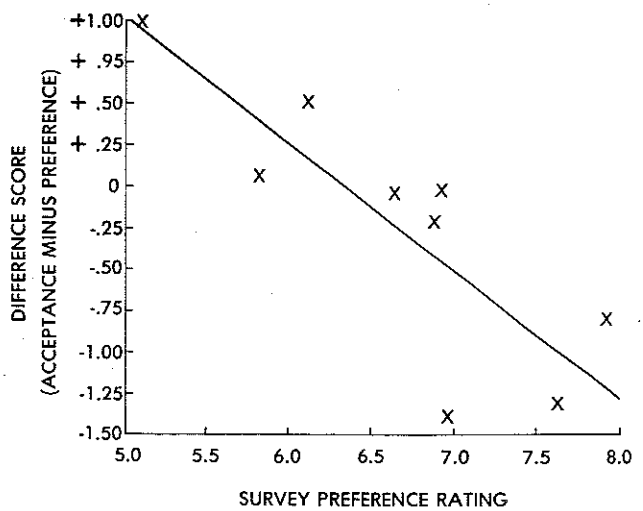

Fig. 1—Mean difference scores (mean acceptance ratings assigned to samples A and B minus preference ratings for item) for each food item as a function of mean preference rating for the item.

ence for the item. A similar, but less systematic increase in the standard deviations of the acceptability scores can be seen if one ranks the acceptability scores in decreasing order. Such heterogeneity of variance is to be expected, since mean values that are close to the extremes of the scale would have their variance restrained by the fact that scores cannot exceed the upper or lower extremes.

Since two identical samples of each food were presented, an estimate of the reliability of the acceptance judgments was made. Table 4 shows Pearson product-moment correlation coefficeints between the acceptance ratings obtained for the two identical samples. Data are presented for individual food items, as well as across all foods. The coefficients in Table 4 are all significant at the 0.01 probability level and indicate good test-retest reliability.

Table 5 shows the Pearson product-moment correlation coefficients between the frequency preference ratings and the acceptability ratings for each food item and across all foods. Again, only the coefficients across all foods are statistically significant, but are again, not of predictive importance.

In order to assess whether a panelist's assignment of differential acceptability ratings to the different samples of the same food was affected by either his preference or acceptance for that food, a difference score was calculated for each panelist, based on his acceptability ratings for the different samples. The difference score was calculated as the absolute difference between the mean acceptability rating for the identical samples (A and B) and the acceptability rating assigned to the different sample (C). These difference scores were then correlated with the individual's hedonic-preference rating, frequency-preference rating, and mean acceptability rating for the identical samples of that food. Table 6 shows the resulting Pearson product-moment correlation coefficients.

Examination of the coefficients in Table 6 shows that the difference scores for acceptability do not co-vary with the frequency measures of preference for any food item. Difference scores do co-vary significantly with hedonic preference ratings for three of the nine items, and with hedonic acceptability ratings for six of the nine items. In the latter case, all correlations are positive, indicating that those individuals who liked the identical samples had a larger absolute difference between their ratings of these samples and their ratings of the odd sample. In the case of the correlations with hedonic preference, two of the three significant correlations were positive, but one (lima beans) was negative. Over all foods, only the correlation with acceptability ratings was significant.

Table 3—Pearson product-moment correlation coefficients (r) between hedonic preference ratings and acceptability ratings for nine test foods

	Correlation of hedonic preference rating with acceptability rating for:		
	Sample A	Sample B	Mean of samples A and B
Whole Milk	0.17	0.14	0.18
Bacon	0.04	0.01	0.02
Hash Browns	0.08	0.02	−0.06
Tomato Juice	0.08	0.32	0.22
Frankfurters	0.41	0.19	0.31
Pork and Beans	0.29	0.18	0.28
Skimmed Milk	0.16	0.09	0.14
Liver and Onions	0.61**	0.51**	0.61**
Lima Beans	0.29	0.26	0.31
Overall	0.30**	0.23**	0.30**

** $p < 0.01$

Concerning the relationship between preference ratings for laboratory and field panels, mean hedonic preference ratings obtained during two adminsitrations of the 200 item preference surveys to military personnel in the field (Wyant et al., 1979) were correlated with the mean hedonic preference ratings obtained with the laboratory panel. The resulting Pearson product-moment correlations were +0.84 and +0.83 for the two adminstrations of the field survey. These correlation coefficeints can be compared to the obtained correlation of 0.94 between the two military field surveys.

Of the 200 food items on the survey form, the laboratory panel had higher absolute preference ratings than the military panel on 171 of the items. Table 7 lists those 29 items (14%) for which the laboratory panel had lower ratings. The majority of these items are Southern and Western style dishes and beverages.

DISCUSSION

THE DATA in Table 2 and Fig. 1 show that the range of acceptability ratings for foods is smaller than the range of preference ratings for the same foods. That is, foods that are rated as being less liked on a like-dislike preference scale are rated as being more highly liked when actually tasted and rated for acceptance. Similarly, foods that are rated as being more highly liked on a preference scale are rated less highly, when actually tasted and rated for acceptance. It is, as if, our stated preferences for foods reflect a quintessential or idealized image or memory trace of the food, and that actual preparations of the food item are never as good or as bad as this mental image. Perhaps this relationship accounts for the commonly-noted food monotony effects, in which highly preferred food items lose their

Table 4—Pearson product-moment correlation coefficients between the acceptability ratings assigned to identical food items within the same test session

	r
Whole Milk	0.46**
Bacon	0.50**
Hashed Browns	0.36**
Tomato Juice	0.70**
Frankfurters	0.63**
Pork and Beans	0.49**
Skimmed Milk	0.58**
Liver and Onions	0.69**
Lima Beans	0.54**
Overall	0.57**

** $p < 0.01$

Table 5—Pearson product-moment correlation (r) coefficients between frequency-preference ratings and acceptability ratings for nine test foods

	Correlation of frequency preference ratings with acceptability ratings for:		
	Sample A	Sample B	Mean of samples A and B
Whole Milk	0.23	0.12	0.20
Bacon	0.09	0.26	0.21
Hash Browns	0.12	0.03	0.10
Tomato Juice	−0.25	−0.14	−0.21
Frankfurters	0.31	0.12	0.14
Pork and Beans	0.08	0.13	0.12
Skimmed Milk	0.01	0.05	0.04
Liver and Onions	0.28	−0.10	0.11
Overall	0.16**	0.13**	0.17**

** $p < 0.01$

appeal when eaten repeatedly within a short period of time, and for the "not as bad as I thought" effect in which unliked but untried foods are frequently found to be acceptable when actually eaten.

The relationship between preference and acceptance ratings for "liked" and "disliked" items conflicts with Kamenetzky and Pilgrim's (1958) interpretation that hedonic preference ratings reflect the respondent's opinion of the best preparation of the food item. While the present data support such an interpretation for preferred food items, it is clear from these data that preference ratings of nonpreferred items reflect the respondent's opinion of the "worst" preparaton of the food.

The data in Tables 3 and 5 address the central question of the relationship between preference and acceptance. As can be seen in these tables, there is a poor linear relationship between either hedonic or frequency preference ratings and acceptance ratings for almost all food items. Only in the case of liver and onions is their a statistically significant correlation within a single food item. When all foods are combined, significant correlation coefficients are found, but their low values indicate poor predictive validity. Overall, the obtained correlations between preference and acceptance fall within the ranges reported previously by Branch (1973). It seems clear from these data that an individual's food preference ratings is not a good predictor of the acceptability of that food item to the individual. The particular preparation of the food plays a predominant role in the determination of its acceptance. However, since the correlations between preference and acceptance measures across food items were good, preference measures can serve as a useful index of relative acceptance for menu-planning purposes.

Table 6—Pearson product-moment correlation (r) coefficients for the relationships of hedonic preference ratings, frequency preference ratings and acceptability ratings with difference scores (see text)

	Preference		
	Frequency	Hedonic	Acceptance
Whole Milk	−0.012	−0.056	0.355**
Bacon	−0.039	0.010	0.611**
Hashed Browns	0.002	−0.078	0.272**
Tomato Juice	0.021	0.377**	0.341**
Frankfurters	0.155	0.326	0.724**
Pork and Beans	0.168	0.087	0.043**
Skimmed Milk	0.222	0.388**	0.615**
Liver and Onions	0.056	0.187	0.485**
Lima Beans	−0.158	−0.450**	0.069**
Overall	−0.001	0.056	0.352**

** $p < 0.01$

Table 7—Food items from 200 item food preference survey for which laboratory panel scored lower than field panels (in alphabetical order)

Avocado Salad	Fried Okra
Barbequed Spare Ribs	Fried Shrimp
Burritos	Grilled Steak
Buttered Whole Kernel Corn	Grits
Canned Fruit Cocktail	Ham
Chef's Salad	Hot Chocolate
Chili con carne	Ice Tea
Chitterlings	Lemonade
Chocolate Milk	Milk
Cola	Refried Beans
Collard Greens	Sloppy Joes
Corn Bread	Sweet Potato Pie
Deviled Eggs	Tacos
Enchiladas	Watermelon
Fried Chicken	

The correlation coefficients in Table 4 provide an index of the reliability of acceptability ratings within a single session. While the reliability coefficients vary among foods, the overall correlation of 0.57 reflects good reliability. The value of 0.57 can be compared to reliability coefficients of 0.60 (Waterman et al., 1974), 0.74 (Smutz et al., 1974), 0.98 (Schutz, 1956) and 0.95–0.99 (Peryam et al., 1960) when this same scale is used to obtain preference data, and the correlation coefficient reported earlier between the two administrations of the field preference surveys falls well within this latter range (0.83 and 0.84).

The data in Table 6 show significant positive correlations between the difference in acceptability ratings for the two different samples of the food and the absolute acceptance ratings for that food. However, no relationship was found between this measure of hedonic discrimination and the individual's preference rating for that food. In view of the low correlations that were found between preference and acceptance ratings for a single item, these results are not surprising. Of greater interest is the fact that both the significant and non-significant correlation coefficients in the last column of Table 6 were positive. This fact means that those people who liked the food item more, were more likely to differentiate between the two different samples of the food. The reasons behind this difference go beyond the descriptive data reported here, but may be partly related to differences in the frequency of exposure to the food item and/or its preparations. That is, someone who dislikes a food would be expected to eat it infrequently, as compared to someone who likes it. This broader experience with preparation styles for that food item may be responsible for the greater hedonic sensitivity to more acceptable items.

The fact that the laboratory panel preference ratings for 171 of the 200 food items were higher than for the military panel parallels Peryam and Haynes' (1957) finding that laboratory (civilian) acceptance ratings for most foods are higher than military acceptance ratings. The 29 items for which higher mean ratings were found for the military respondents (Table 7) can almost all be explained by demographic differences between the average military population (younger, more ethnic, less regional) and the laboratory population used in these experiments (see Meiselman, 1973, for a discussion of regional differences in military food preferences).

The results of these studies suggest that the idiosyncratic preferences of volunteer taste panelists for particular test foods need not be of major concern when selecting panelists, since there is little relationship between the food preferences of panelists and their subsequent acceptance ratings for individual foods. However, if the acceptability of a particular test sample is high, then the panelist may be more likely to assign a differential acceptance rating to different prepartions of that food, than would a panelist who dislikes the test sample. This phenomenon constitutes one of many response biases that should be considered in sensory evaluation tests.

REFERENCES

Branch, L.G. 1973. An evaluation of common predictors of consumer acceptance. Technical Report #73-42-PR, U.S. Army Natick Laboratories, Natick, MA.

Ellis, B.H. 1969. Acceptance and consumer preference testing. J. Dairy Sci. 52: 833.

IFT. 1981. Sensory evaluation guide for testing food and beverage products. Food Technol., 35(11): 50.

Kamen, J.M. 1962. Reasons for nonconsumption of food in the Army. J. Am. Dietetic Assoc. 41: 437.

Kamenetzky, J. and Pilgrim, F.J. 1958. Interpretation of preference ratings. Report #16-58, Quartermaster Food and Container Institute, Chicago, IL.

—Continued on page 1561

Kamenetzky, J., Pilgrim, F.J., and Schutz, H.G. 1957. Relationship of consumption to preference under different field conditions. Technical Report #37-57, Quartermaster Food and Container Institute, Chicago, IL.
Meiselman, H.L. 1973. Regional differences and consumers. Paper presented at 28th Conference of the Society for the Advancement of Food Service Research, Miami, FL.
Meiselman, H.L. 1973. Food preference-frequency measurement. The Hornblower (IFT, Northern California) 27: 9.
Meiselman, H.L., Van Horne, W., Hasenzahl, B., and Wehrly, T. 1972. The 1972 Fort Lewis food preference survey. Technical Report #TR 72-43-PR, U.S. Army Natick Laboratories, Natick, MA.
Meiselman, H.L. and Waterman, D. 1978. Food preferences of enlisted personnel in the Armed Forces. J. Am. Dietetic Assoc. 73: 621.
Meiselman, H.L., Waterman, D., and Symington, L.E. 1974. Armed Forces food preferences. Technical Report #75-63-FSL, U.S. Army Natick Development Center, Natick, MA.
Nichols, T.L., Swanson, J.B., and Kluter, R.A. 1972. Group differences in sensory evaluation of foods. Abstract #109, 1972 Annual Report, Pioneering Research Laboratory, U.S. Army Natick Laboratory, Natick, MA.
Peryam, D.R. and Girardot, N.F. 1952. Advanced taste test method. Food Engineering 24(7): 58.
Peryam, D.R. and Haynes, J.G. 1957. Prediction of soldiers' food preferences by laboratory methods. J. Appl. Psychol. 41: 2.
Peryam, D.R. and Pilgrim, F.J. 1957. Hedonic scale method of measuring food preferences. Food Technol. 11(9): 9.
Peryam, D.R., Polemis, B.W., Kamen, J.M., Eidhoven, J., and Pilgrim, F.J. 1960. Food preferences of men in the Armed Forces. Chicago: Quartermaster Food and Container Institute.
Pilgrim, F.J. 1961. What foods do people accept or reject? J. Am. Dietetic Assoc. 38: 439.
Schutz, H.G. 1957. Performance ratings as predictors of food consumption. Am. Psychol. 12: 380.
Schutz, H.G. 1965. A food action rating scale for measuring food acceptance. J. Food Sci., 30, 365—374.
Seaton, R.W. and D.H. Peryam. 1970. Hunger, food preference, and consumption. Human Factors, 12(6): 515.
Sidel, J.L., Stone, H., Woolsey, A., and Mecredy, J.M. 1972. Correlation between hedonic ratings and consumption of beer. J. Food Sci. 37: 335.
Smutz, E.R., Jacobs, H.L., Waterman, D., and Caldwell, M. 1974. Small sample studies of food habits: 1. The relationship between food preference and food choice in naval enlisted personnel at the Naval Construction Battalion Center, Davisville, Rhode Island. Technical Report #75-52-FSL, U.S. Army Natick Laboratories, Natick, MA.
Sullins, W.R. Jr., Symington, L.E., Siebold, J.R., and Rogers, J.G. 1977. Food preference, acceptance, and consumption in a simulated, isolated-duty station. Technical Report #TR-78-027, U.S. Army Natick Research and Development Laboratories, Natick, MA.
Waterman, D., Meiselman, H.L., Branch, L., and Taylor, M. 1974. The 1972 Westover Air force Base food preference survey and reliability study. Technical Report #75-25-FSL, U.S. Army Natick Laboratories, Natick, MA.
Wyant, K.W., Meiselman, H.L., and Waterman, D. 1979. U.S. Air Force food habits study: Part I, Method and overview. Technical Report #TR-79-041, U.S. Army Natick Research and Development Command, Natick, MA.
Ms received 11/9/81; revised 2/10/82; accepted 2/24/82.

This paper reports research undertaken at the U.S. Army Natick Research and Development Command and has been assigned No. TP2200 in the series of papers approved for publication. The findings in this paper are not to be construed as an official Dept. of the Army position.